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# The Wireless World

THE PRACTICAL RADIO JOURNAL

with

## Complete Foreign Programmes

Friday, October 6th, 1933.

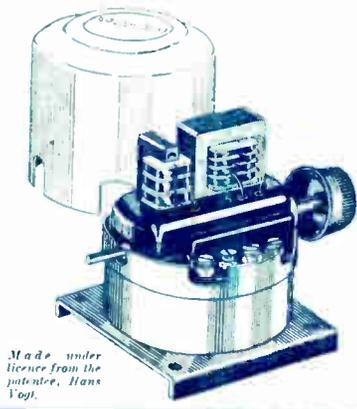
### COLVERN FERROCART COILS

COMPACT!  
EFFICIENT!  
SELECTIVE!

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RADIO EXHIBITION  
STAND No. 32.

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Made under license from the patentee, Hans Vogt.

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Specified by the designer of the "Wireless World" NEW MONODIAL SUPER. Ideal for every superhet where lasting efficiency is the first essential. Totally screened. The world's finest value at the new reduced price of **7'6**

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Announcement of the Telsen Electric Co., Ltd., Aston, Birmingham.

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ALL-BRITISH  
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EXTRACT FROM A TESTIMONIAL.

Crouch End, N.8.  
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Dear Sirs,

You will be interested to learn that I shall shortly be discarding one of your H.T. batteries. The H.T. Battery in question is a "Siemens Power" 100 volt and was purchased by me in November 1931, and has been in use in conjunction with a 3 valve set since that date—a matter of 17 months.

I am,

Yours faithfully,  
(Signed) C.H.

**SIEMENS**

**FULL O'POWER**  
**RADIO BATTERIES**

**THEY COST NO MORE THAN ORDINARY BATTERIES**

Write for free booklet 667 of up-to-date Battery information.

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SET MANUFACTURERS AS WELL  
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KNOW AND APPRECIATE THE FULL  
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Every LYONS - “B.A.T.” Component Part has had to pass its exhaustive tests with flying colours in our extensive research laboratories, before we are willing to market it.

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Genuine Wire-Wound up to 50,000 Ohms. Special and absolutely noiseless pattern, up to 1-Megohm. Any “taper.” With or without mains-switch. Ganged Controls. Triple “Mixers,” etc.

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All Types, for “Eliminators,” Power-Packs, etc. “Standard” dissipating 18 Watts. “Power” (35 Watts) and “Super-Power” (250 Watts).

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Dozens of patterns, each the pioneer of its type. S.P., D.P., 2-Way, 3-Point, Semi-Rotary, D.P.D.T., T.P., T.P.D.T., 4-Way Rotary, etc. Also “specials.”

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The Half-Crown Gadget which positively cures objectionable A.C. Mains “HUM.” An Essential in every Radio, or Amplifier.

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The original wire-end, colour-coded pattern. 1, 2, 3 and 5-Watts, all resistance values. Cheapest (10½d. per Watt), and Best. Also 10, 20, 30, 50, 60, 100 and 120-Watt to special order.

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THE life of a battery is the life of its cells. That is where the Grosvenor MERCURY process works such wonders. It guards the cells against corrosion — makes them last so long that they are crammed by hydraulic pressure with extra chemicals to use them up.

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Grosvenor Mercury Batteries are made in three grades for every Radio need:  
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Multitone were the first to introduce Class "B" components. Now they are the first to publish a *complete* guide telling you how to use them most effectively in Class "B" circuits. Write to Dept. D, for a free copy of this *new* Guide to Class "B" if you're wanting to know all about the theory and practice of Class "B" amplification.

### TOCO TONE CONTROL TRANSFORMER

	Price
ratio 1.4 (saves an EXTRA 30% H.T.)	17/6
Graded Potentiometer	3/6

Both specified *without alternative*, in the A.V.C. Three.

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Those who do not wish to interfere with the wiring of their present set can buy this simple unit. Just plug in adaptor to last valve stage and enjoy Class "B" advantages	37/6
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(75)

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An Apollo Playing Desk will double the value and usefulness of your Wireless Set, as well as converting it into a handsome piece of furniture. You simply place the set on the Desk and connect Pickup leads.

## IN LIGHT, MEDIUM or DARK WALNUT TO MATCH VARIOUS WIRELESS SETS

Size of top 18" x 11 1/2"

CASH PRICE 8 GNS.

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As illustrated, with Collaro Induction Motor and Pickup, automatic current stop, volume control, record cupboard, etc. Also supplied fitted with GARRARD AUTOMATIC RECORD CHANGER and volume control: complete for £15-5-0 cash, or 30/- deposit and 11 payments of 30/-.

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**Only first-class men with extensive experience in these particular branches of radio need apply.**

**All applications will be treated as strictly confidential.**

**Write with fullest details, stating age, experience and salary required, to Box No. 8241, "Wireless World," Dorset House, Stamford Street, London, S.E.1.**

YOU CAN'T AFFORD TO BUY UNRELIABLE TRANSFORMERS  
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Savage Mains Transformers are built up to a standard, not down to a price. Savage simply cannot afford to put his name on mediocre instruments. That is why it's such a sound policy to come to Savage for transformers. You know that they are well designed and that they are built of the best possible raw materials. You know that every one has passed a triple-testing of unusual severity. Think carefully before you buy your new mains transformer — then make up your mind to come to Savage.

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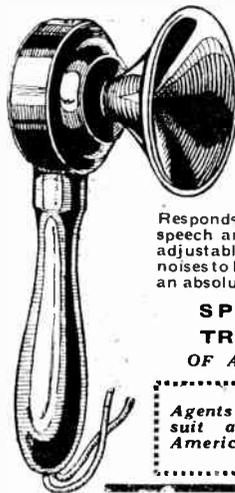
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A scientifically made instrument suitable for Public Address, Home Recording, Transmitting, House and Factory Telephone and many other uses.

**CAN BE USED ON ANY WIRELESS RECEIVER**

Responds evenly to all sound-frequencies, giving crystal-clear speech and music at any power of amplification. Sensitivity is adjustable to suit output volume, a great advance enabling parasitic noises to be eliminated, thereby ensuring an absolutely silent background

NEW LOW PRICE **7/6**

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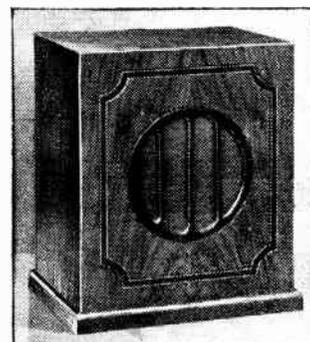
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Works: S. Croydon

"NUTONE"

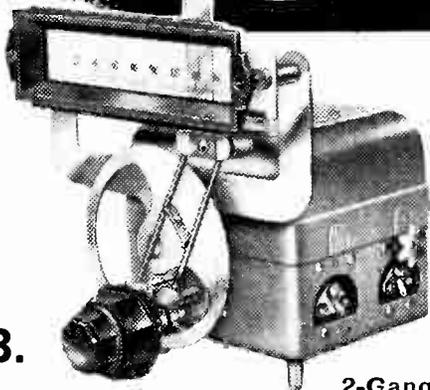


**JUST ANOTHER WAY OF SAYING -**

Whatever the circuit, the experienced constructor will always choose "J.B." For tuning iron-cored coils, in particular, the accurate matching found in J.B. Gangs becomes imperative; and the mechanical rigidity of "J.B." ensures the permanence of this matching. Illustrated is the new J.B. LINATUNE with one trimmer panel—operated by a knob concentric with the main tuning control. It is fitted with the new J.B. Straight-Line Dial, the whole scale being always on view and illuminated by a lamp-holder which travels with the cursor.

Prices (with cover):

2-Gang, 22/6; 3-Gang, 27/6



**THE NEW J.B. LINATUNE GANG**

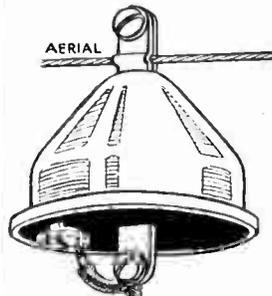
2-Gang 22/6

**PRECISION INSTRUMENTS**

Advertisement of Jackson Bros. (London) Ltd., 72, St. Thomas' Street, London, S.E.1 Telephone: Hop 1837.

# Sh-h stop all that noise!

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The greatest bugbear encountered in the quest for perfect wireless reception lies in the interference caused by neighbouring electrical apparatus. Prior to the appearance of the "RADIOFORMER" this nuisance could be cured only by action on the part of the owners of interfering appliances, but with the advent of the "RADIOFORMER" a new prospect opens before the set owner. Consisting of the Aerial and Set Radioformers, with 50 feet of shielded down lead, the kit will make a world of difference to the reception of any set on

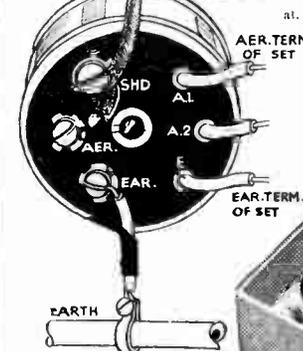
wavelengths from 15 to 550 metres, and with only the slightest weakening of the less powerful signals on the long waves.

The RADIOFORMER eliminates "static" when the set is tuned to a station. Many sets fitted with A.V.C. become extremely sensitive between stations, and pick up a great deal of noise. The so-called interference suppressors are fitted to reduce this noise between stations whereas the RADIOFORMER reduces the noise which interferes with pure reception of a station.

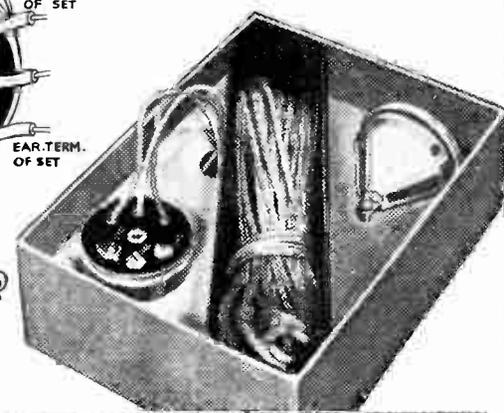
**17'6**  
COMPLETE  
POST FREE

**SINGLE UNITS**

Aerial Transformer Type A.	7/6
Set Transformer Type S.	7/6
Shielded Cable, 50 ft.	4/6
Ditto 100 ft.	8/6



at. applied for:  
AER. TERM. OF SET  
EAR. TERM. OF SET



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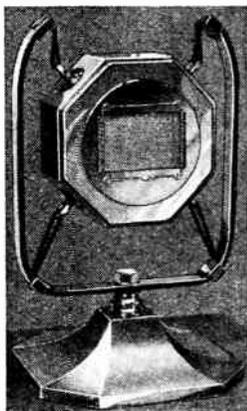
**RADIOFORMER LTD.**  
31 FELDAY ROAD  
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come to the Specialists!

We have supplied the highest grade **Microphones**, at fantastically low prices to the most important contractors all over the world. In most cases quality of response has been of greater consideration than economy of price but our sensational offers undoubtedly fulfil both these conditions. We illustrate here two of the most efficient **Microphones** it is possible to obtain at any price and you have our assurance that if they fail to give every satisfaction on the most exacting work, we will gladly refund purchase price. All **Microphones** are brand-new, flawless and guaranteed.

**GENUINE REISZ P.A. MICROPHONES**  
**55/-** (post free.)

In heavy octagonal solid aluminium case, 5 ins. dia., with 4 suspension rings. Perfect even response, no peaks, no cut-off. Handsome plated stand with heavy oxidised base and rubber suspension, 15/- extra. Bronze telescopic floor stand, with suspension clips, 27/6 extra. Reisz type transformer, 7/6 extra.



REISZ

**THE WORLD'S  
FINEST MOVING COIL MICROPHONES**

Complete on stand as illustrated. **72/6** (post free.)

These are fitted with Swift Levick permanent cobalt magnets. Perfect combination of sensitivity and quality. Requiring no polarising voltage there is entire absence of background and hum. Entirely insensitive to external vibration. Dia. 3 1/2 ins. Stand 15 ins. high, polished black with chromium ring and fittings. All chromium stand, ideal for large receptions and social functions, 3/6 extra. Special high ratio transformer, 7/6 extra.

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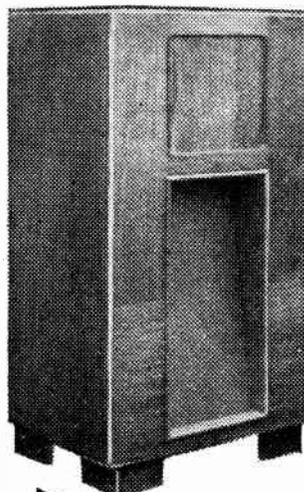


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224, Shaftesbury Avenue, London, W.C.2. Phone: Temple Bar 4175.  
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FOR W.W. RECEIVERS



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WRITE FOR OUR FREE BOOKLET, "NOTES ON THE DESIGN OF LOCKWOOD CASEWORK"

SPECIAL FACILITIES FOR H.P. ARRANGE O

- SPEAKER FOCUSING, FLOODLIT RECESS.
- SHOCK ABSORBING FEET.
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- 1/2" MATERIAL THROUGHOUT.
- COMPLETE WITH 1/2" BAFFLEBOARD, READY DRILLED AND SILK GAUZE

Overall Dimensions: 36 1/2" HIGH x 20" WIDE x 15" DEEP

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OAK, MAHOGANY } Various Colour } **79/6** Carriage  
OR WALNUT } Combinations } Paid

**THE LOCKWOOD CASEWORK MFG. Co.**  
63, LONGLEY ROAD, HARROW, MDX.

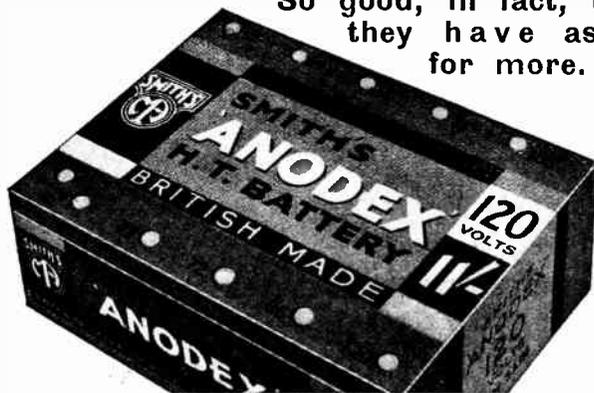
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THE IDEAL RADIO STORES, 23, CLARENDON ROAD HARROW

**Are you a modern  
Oliver Twist—**

Write for literature and name of nearest agent.

one of those people who who have tried 'Anodex' Dry Batteries and found them unusually good? So good, in fact, that they have asked for more.



**"ANODEX"**

**DRY BATTERIES,**

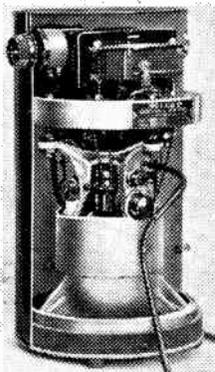
S. SMITH & SONS (Motor Accessories) LTD., CRICKLEWOOD, LONDON, N.W.2

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**50 CYCLE A.C. THE NELCO ROTARY CONVERTER**

(Prov. Patent)  
From your D.C. Mains

is the only converter specially designed for use with the new Synchronous gramophone motors. It is provided with a speed regulator, and frequency of 50 cycles is accurately indicated. This device enables anyone to obtain exactly 50 cycle A.C. irrespective of input voltage and load. Efficiently smoothed and entirely free from electrical interference, it can be used with the most sensitive receivers. Silent and reliable. Occupies extremely small floor space. A highly finished, sound mechanical and electrical job. Made throughout at our works at Shalford, Surrey.



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ROAD, LONDON, W.C. Phone: Shalford 159.

**SELECTIVITY**

DOES NOT FINISH WITH YOUR TUNED CIRCUITS.

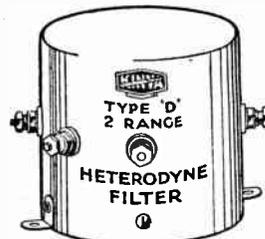
HETERODYNE - WHISTLE AND 'SPASH' ARE STILL WITH YOU.

**THIS FILTER FOR MERELY 7/6 WILL REMOVE THE REMNANTS OF THE ADJACENT STATION.**

CUT-OFF FREQUENCY 3500 OR 5000 C.P.S. ACCORDING TO CONNECTION.

SECOND ONLY TO OUR TYPE A3.

(See last week's issue).



SCREEN, 2 1/2" High x 2 1/2" Diameter.

3 YEARS' RESEARCH BEHIND THESE FILTERS ENSURES SATISFACTION.

Full Details. Curves, on request.



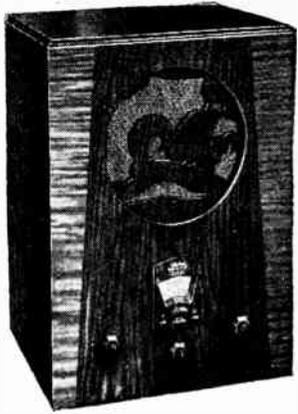
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Brilliant ideas that have been accepted because they have proved to work well in practice. To buy a Varley set, is to purchase a modern radio with the most up-to-date circuit that has been produced.

The latest Varley achievement—a five-valve mains Superhet with automatic volume control. "A set bristling with original technical ideas. An advanced design in every way. Altogether a very fine set demonstrating progress."

Write to us now for free brochure fully describing the whole range of Varley receivers and radio-gramophones.



## SPECIFICATION

5 Valves and Rectifier. Band-Pass I.F. Couplings. Six tuned circuits with single knob control. Automatic Volume Control. Sockets for Pick-up. Provision for using an external speaker. Undistorted Output : 1,600 Milliwatts. Current Consumption : 60 watts. Overall Dimensions : 18½ in. high × 11 in. deep × 13 in. wide. List No. AP48. For A.C. Mains only. 100/120 volts or 200/250 volts 40/100 cycles. PRICE 18 GNS. (including Valves and Royalties). 25-cycle Model, 1 guinea extra

# Varley

PROPRIETORS : OLIVER PELL CONTROL LTD.)

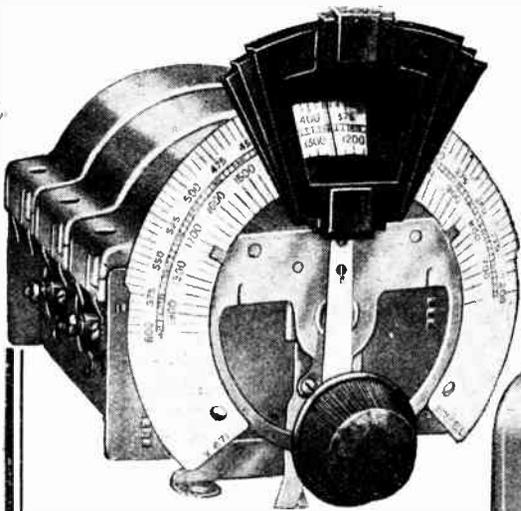
Agents: Oliver Pell Control Ltd., Kingsway House, 103, Kingsway, W.C.2. Phone: Holborn 5303.

# POLAR STAR and Star Minor Gang Condensers....

This is a selection from the comprehensive range of Polar Gang Condensers and Drives. There are types to meet every requirement. All drives illustrated are interchangeable with any of the condensers described.

When you buy Polar—remember there is a reputation of over 11 years behind each product.

## Polar "Full-Vision" Drives



### POLAR "STAR" THREE & FOUR GANG & SUPERHET

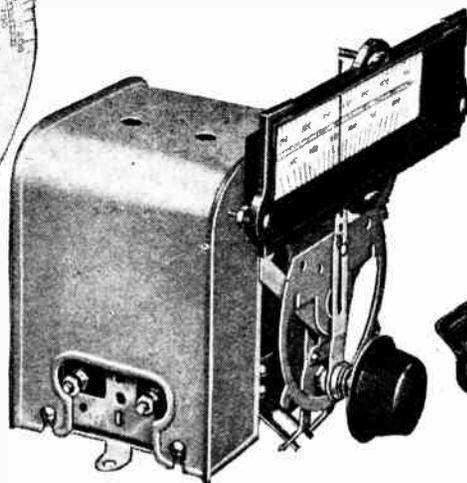
Cadmium plated steel frame of rigid construction. Universal feet supplied permitting base or side mounting. Trimmers operated from top. Sections matched to within 1% or 1 mmfd. (whichever is greater). Drive is fitted with bevelled scale, calibrated in degrees and wavelengths.

3 .0005	22/6
3 .0005 with Moving Scale Drive as illustrated	27/-
4 .0005	20/-
4 .0005 with Moving Scale Drive as illustrated	34/6

Can also be fitted with Full-Vision "Arcuate," "Horizontal" or "Semi-circular" Drives.

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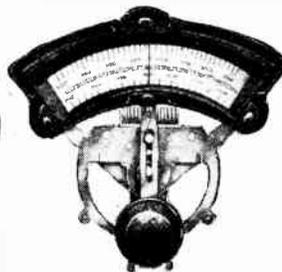


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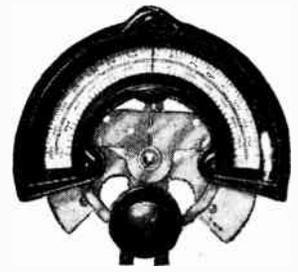
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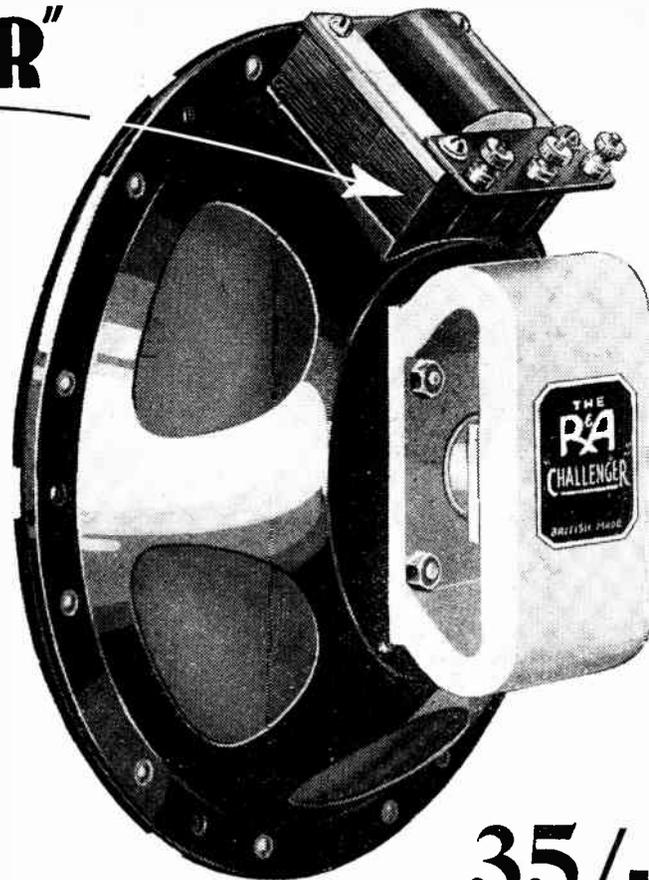
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# The Wireless World

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As many of the circuits and apparatus described in these  
pages are covered by patents, readers are advised, before  
making use of them, to satisfy themselves that they would  
not be infringing patents.

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## EDITORIAL COMMENT

### Broadcast Call-signs Re-identification with Lucerne Changes

**I**N last week's issue we referred to a proposal put forward by a reader that call-signs should be adopted by the broadcasting stations of Europe, to be used in frequent announcements on the same lines as has been long in use in America, for the purpose of enabling the listeners to identify the stations. Far too little attention has been paid to this matter in Europe, and there is no justification for assuming that the public is not interested in identification of the stations from which emanates any particular programme to which they may be listening.

Even if objections may be raised to introducing a comprehensive scheme throughout Europe, there is still every reason why all stations changing wavelengths according to the Lucerne Plan in January next should, at least for some weeks, take special steps to help their listeners in the task of re-identification.

### Television

#### B.B.C. Will Carry On

**A** NEW television scare has been started with the suggestion that the B.B.C. intends to discontinue television transmissions. The true facts are that there is an agreement between the B.B.C. and the Baird Company, under which the B.B.C. undertakes to conduct transmissions by the Baird system for a certain period. This period and the agreement expire in 1934, and no information has yet been given as to renewal or revision. Some people have therefore jumped to the conclu-

sion that the B.B.C. is abandoning television as from that date.

Far from abandoning television, we can safely say that the B.B.C. was never more actively interested in the project than now, but we must move with the times and improve upon the present transmissions as technical progress justifies it. Even when a short-wave system comes into use for regular transmission with greater detail of picture, it is quite likely that the present 30 line Baird transmissions will also be retained as a standby and an alternative to the more promising systems now being developed, in particular by the Baird Company.

### Foreign Programmes

#### A Special Supplement

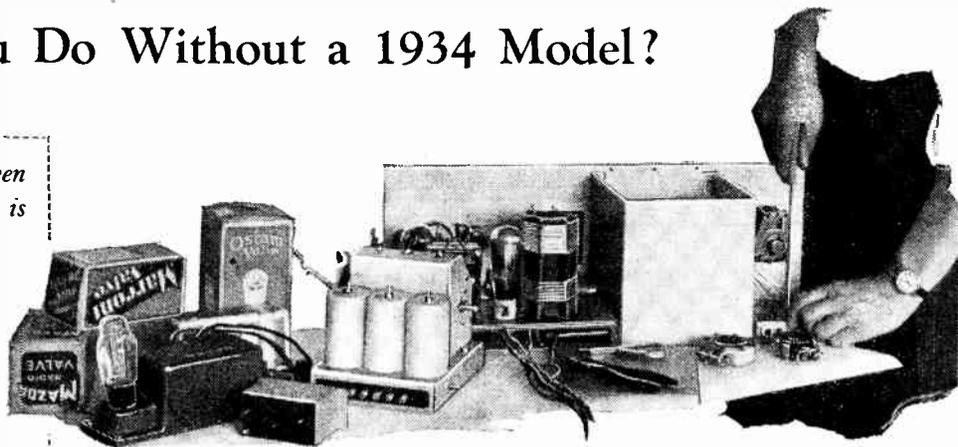
**W**ITH this week's issue we commence the publication of the full programmes for the week from Continental and other stations abroad, in the form of a Special Supplement on coloured paper, and this information will be continued week by week in this form. We believe that the interest of our readers in foreign station reception during the coming winter will be greater than ever before, because stations have increased in power and in quality of their programmes, whilst at the same time improvements in receivers have helped to bring a very large number of the Continental stations up to a strength equal to the local.

There is also included with this issue another useful Supplement, in the form of a 32-page booklet of Practical Hints and Tips, which we believe will be found of great value, especially at this time of the year when so many listeners begin to take a more practical and intimate interest in their sets in preparation for winter listening.

# The Autumn Spring Clean

Or, Can You Do Without a 1934 Model?

**D**URING a summer such as we have been enjoying this year the wireless set is likely to have missed the periodical tuning up which it might have expected to receive during wet week-ends. Now that autumn is here we should give the set a thorough overhaul and decide if its standard is high enough for the winter service we expect from it.



If the set is an old one a complete overhaul and some replacements will be necessary.

**O**NE of the functions of the cinema is to enable those who, for various reasons, are denied the delight of love-making, to enjoy it vicariously by watching the perfect technique displayed on the screen, and, in doing so, to forget for a time their own limitations. In the same way, relatively few among the crowds that recently flocked to Olympia went there with the knowledge that they could select an up-to-date model; the others had to be content to be thrilled in imagination. Yet need they? The old set that has been accumulating dust during this sunny summer may be showing a few wrinkles and grey hairs, but the job of rejuvenating it will be more interesting than buying something ready made, and the result may not be far behind it in performance. There is a tremendous amount of satisfaction to be gained from making sure that everything is in perfect tune, and perhaps discovering quite unexpected merits by clearing faults that had lain hidden.

Of course, it is quite impossible to explain in detail all that might be done to every possible type and vintage—single-valve, straight-three, portable, superhet, short-wave, radio-gram, battery, A.C., D.C., and perhaps even crystal or coherer—so what follows is intended to give suggestions; most of the details can be gleaned from back numbers of *The Wireless World*.

## Testing Contacts

Beginning with what can be done at little or no cost, we shall go on to suggest more organic modernisations, yet short of the expense of a new receiver.

One of the most comprehensive items in any overhaul can be summed up in one word—Contact. If the wiring has been carried out really well in the first event it should last indefinitely—apart from severe knocking about, or chemical corrosion. But, rather than chance this, it is wise to test the soundness of all soldered joints by tugging at them with sharp-nosed

pliers, and giving all screw contacts a shrewd twist. Valve sockets and pins can often do with a little opening out or adjustment, and the same applies to other plug connections. And, while on the subject of connections, how about tidying them up generally? There are firms who have specialised for years in perfecting all sorts of terminals and connectors, and the result of a few shillings spent on their products will certainly show a vast improvement in appearance over improvised joints and leads, and may save interruptions, due to a "technical hitch," in vital programmes. At the same time, it is not a bad idea to include a set of uniform knobs, which several manufacturers now supply, to substitute for the odd lot seen on the panels of so many home-built sets.

## POINTS TO WATCH

- Dust and dirt anywhere
- Disconnections in wiring
- Bad contacts in switches
- Aerials and earths with bad or intermittent connections
- Grid batteries worn out
- Run-down H.T. batteries
- Noisy volume controls
- Valves

An entirely trouble-free team of switches is sufficiently rare to make inspection of these components an essential feature of even a perfunctory overhaul. Those in H.F. circuits, particularly if they carry no D.C., and heavy-current contacts, are the most likely to need cleaning and adjustment. The contact pressure should be firm, but not excessive, for any action that roughens or grinds the contact surfaces defeats its object. For the same reason the contacts should *not* be cleaned with a file or even ordinary emery paper, which should be reserved for trimming rough surfaces. The contacts should be finally smoothed and cleaned with the finest "blueback" and then burnished

with clean polished steel such as the back of a knife.

Rheostats and volume controls often develop noisiness. This is seldom due to dirt, for that can be removed by one or two rotations; but the turns of wire on the resistance element sometimes loosen and cause irregular contact. After coaxing them into position where the arm rides over them, the adjacent parts of the wire can be stuck down with varnish, taking care to remove any that strays on to the contact surface.

## Importance of the Aerial

The earth connection is usually in some position that for inspection necessitates bent back and dusty knees, and is therefore left to look after itself. The need for an extremely efficient aerial-earth system is not felt so keenly as it used to be, because so much more amplification is obtainable; but that very reason makes a good earth all the more desirable, to avoid hum and instability. Similarly, it is not so important now that the aerial should be able to pull in a lot of signal strength, but it is very important that it should be entirely free from bad or casual contact, such as rubbing on a roof edge or any blemish that would introduce noisiness or fluctuation. On the short waves the faults are the more important, and noise can be caused by bad contacts in connection with the receiving system, if they happen to be anywhere near.

Batteries, where used, will certainly require attention. Instead of just recharging the accumulator, have the acid that has served it for so many years renewed, and the terminals cleaned and revaselined. There is nothing much one can do to dry H.T. except to renew it when necessary, but an accumulator H.T. requires attention, if one is not to be involved in heavy renewal expense. And sometimes grid bias batteries fail rather suddenly and unless replaced pretty quickly by quality and cash melt away. This is particularly true of the

**The Autumn Spring Clean**—particularly true of Q.P.P. systems, or the bias for Class "B" drivers, which need careful supervision if the merits of these systems are not to be lost.

If batteries fall due to be renewed, and electricity is laid on, yet a complete mains set would unbalance the budget, try working out a little calculation to decide whether it is going to be more expensive to get a mains unit (or "eliminator") or to keep on buying batteries. Mains units are not so expensive as they used to be. If no supply is laid on, the best investment is a Class "B" unit, of which a selection is now available, and which can be coupled up and put into action in a minute or two.

### New Valves

Valves are the most important, yet not the most permanent components. Moreover, there are all shades of condition between 100 per cent. and total collapse. Old age may creep on so gradually as to be unobserved. As has often been explained, the best single test of a valve is to measure the anode current with a milliammeter. This is particularly important in the output stage, and it is very difficult to get the best from push-pull and Q.P.P. systems unless the currents in each half are equalised and brought to the correct amount. Adjusting the bias, even of a single valve, is a blind process without a meter.

The commonest defects—apart from obvious ones, such as total failure—are noisiness and gradual loss of emission. The latter can be detected by a milliammeter, and the former by disconnecting the aerial or otherwise cutting out external sources of sound, and putting the receiver into its most sensitive condition. If the background is not perfectly silent, steps should be taken to find out why it isn't. There will be a certain inevitable hiss in superhets, and a slight residue of hum in mains sets. Some noise may be due to H.F. mains interference. The most likely valve to be noisy is the detector, and it should be gently tapped to show up looseness of internal elements. The H.F. valve or valves seldom reveal noisiness unless a carrier wave is being amplified by them, so after all the others have been dealt with they can be tested by tuning to the local station during an interval (a weak carrier

would probably be accompanied by noise of external origin).

If a valve replacement has to be made, it is timely to consider whether there wouldn't be some advantage in substituting a more modern type. Of course, this should not be done haphazardly, or the



The removal of dust and dirt from the valve-holders, switch contacts and condenser vanes will often bring a noticeable improvement in performance.

last state may be worse than the first. It is not exaggerating to say that the substitution of a single valve with more modern characteristics might involve a complete redesign from start to finish. But some less far-reaching improvements can be suggested. One of the new H.F. pentodes can be substituted for a S.G. type, with little or no alteration. There are variable-mu and short-base models to replace the corresponding tetrodes. If the tuned circuits are at all good, this change should bring a useful increase in H.F. magnification. They can give much more output without overloading, too. With a big output there may be some inducement to consider a double-diode-triode, or even D.D. pentode, in place of the old detector. Detector overloading will thereby be abolished; in fact, the bigger the input the better the diode likes it. All these circuit arrangements are fully described by the makers of the valves.

The same type of detector makes it quite a light job to introduce at least a partial measure of A.V.C. The place for hand-volume control is then between the diode and the triode grid. Battery sets with old-fashioned volume controls can be modernised by fitting the new short base variable-mu valves, which at the same time give a full meed of amplification.

### Iron-core Coils

If at this stage the H.F. fever becomes virulent, there will no doubt be an overwhelming desire to make the most of the new H.F. pentodes by installing a set of iron-core coils. It will be remembered that, although the magnification factor is phenomenal—as high as 5,000—the extent to which it is utilised is proportional to the goodness of the tuned circuit, and the best way of improving the latter, without at the same time risking instability due to stray coupling, is to use iron-core tuning coils which are fieldless. It is then necessary to take care of the stray capacities, covering the "live" leads with earthed screening if necessary.

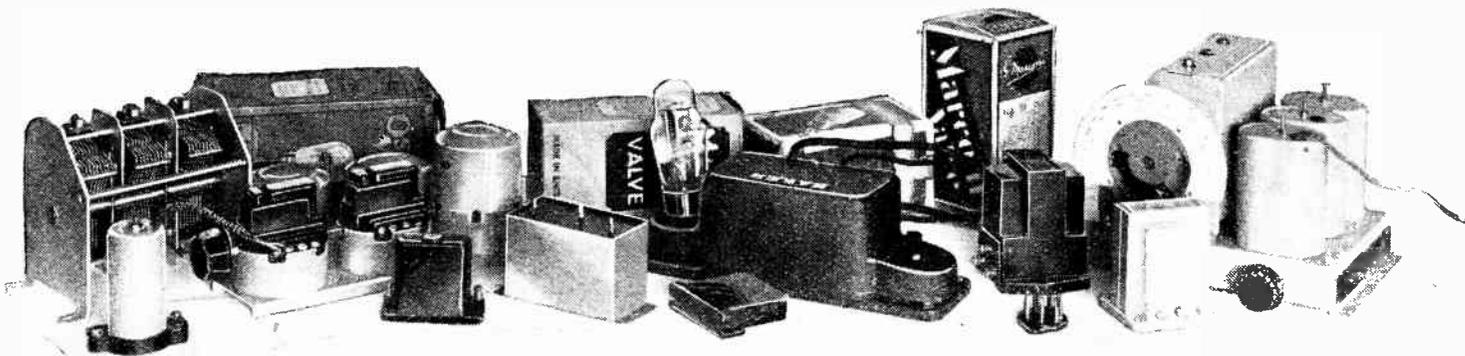
Any tuned circuit improvements will be largely nullified if a bad H.F. choke is used for parallel feeding. It may be assumed that the plain single slot type is below standard for this job, and is only fit for the detector anode. The very best H.F. choke is none too good for parallel feed, because it comes right across the tuned circuit, and most chokes have nasty "hollows" at some wavelengths.

It is also very essential to make sure that ganging is up to the mark. It would be a sound plan in any case to check the ganging in any set with coupled condensers—considerably sharper tuning may be the reward. While attending to the condensers, if the scale is not already calibrated it is time to do it. Don't forget that all the station positions will soon be out of date, when the Lucerne Plan comes into force.

### Decoupling

All this "hotting up" may render the model unstable. Try all you have ever learnt—screening, decoupling, one-point earthing of return leads, orientation of coils. For superhet faults refer to Mr. Cocking's recent comprehensive treatise.\*

\* How the Superhet Works.—Parts I-VII, *The Wireless World*, May 26th-July 7th, 1933.



Iron-cored coils, gang condensers, new valves, a Class "B" unit and up-to-date individual components can all be used to advantage in the remodelling of an old receiver.

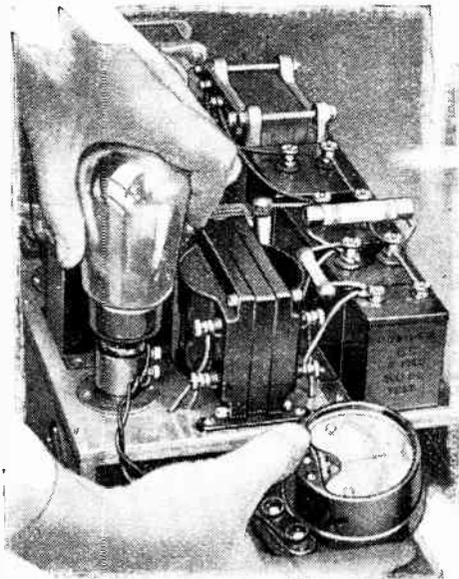
**The Autumn Spring Clean—**

Then, turning to the L.F. side, make sure that the grid bias decoupling is up to date. A 50-mfd. electrolytic condenser, as now used, is safe. The ordinary 2-mfd. cuts bass, and the decoupling filter doesn't always work—there are some curious snags in it when applied to some circuits.\*

If there is a choke-coupled loud speaker output it is customary to use a blocking condenser of at least 2-mfd. Dr. Sims has pointed out some time ago† that a 0.1 mfd. sometimes gives better bass.

These bass improvements may show no hum rather badly. If so, try shifting the transformers about, or move the smoothing chokes—they often couple, with their leakage field due to the anti-saturation gap. But all hum does not come from the loud speaker. Disconnect it entirely, and then hear if the transformer or choke stampings are vibrating. If they are, a dose of varnish, soaked well in between the stampings, will silence them.

Then there is modulation hum. A pair of condensers, each of 0.01 mfd., from rectifier filament to outers of the H.T. transformer secondary, will usually stop it, but they must be at least 1,000-volt



The best single test of a valve is to measure the anode current with a milliammeter.

working (for 250-0-250 transformers, or more in proportion)—the best that can be bought. Another cure for modulation hum (the sort that is heard only when a carrier is tuned) is a H.F. filter in the mains leads. A suitable choke in each lead, and a pair of condensers with the junction earthed, is the usual prescription; but what is not so generally known is that in some situations the cutting out

of interference is more complete when the condensers are on the "mains" side.

By this time we have worked our way to the loud speaker. Perhaps it can be improved by mounting it more substantially, say, in a box-baffle. Get a heterodyne note (without radiating, please!) and run right through the scale of pitch, very slowly. Do this when sensitive people have gone out for the evening. Then if there are any rattles, hold the note until you have located the cause—loose parts, dirt in the gap, etc. It is no light matter to clear the gap of a permanent magnet moving-coil speaker, so every precaution should be taken to keep it protected by a dust cover. Some manufacturers clean out the gap by forcing putty through under pressure. The best method depends on the construction, and the chances of getting the moving-coil assembly back into position after it has been removed. If the risk is taken, look for slack turns of wire on the coil, and varnish them down.

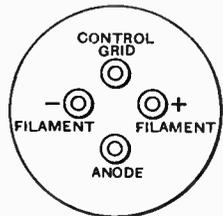
"From Aerial to Loud Speaker" includes everything unless it be a radio-gramophone. Then there are the pick-up and motor. The motor may be the better for a little grease, and inspection may suggest action elsewhere, but otherwise the overhaul will be complete. And perhaps the result will beat the neighbours' 1934 model after all! Or you may decide on a new set yourself. Who knows?

\* "Parallel Feed Precautions," *The Wireless World*, February 17th, 1933.

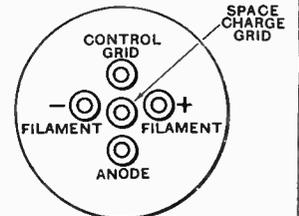
† "New Pentode Output Circuit," *The Wireless World*, June 29th, 1933.

# IDENTIFYING VALVE BASE CONNECTIONS

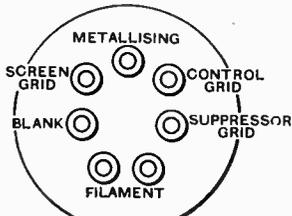
THE number of valve types now available well-nigh precludes their base connections being memorised; for easy reference, therefore, twenty-two of the commoner types are listed below. It should be noted that the view is of the valve base itself and the letters D.H. and I.H. stand for directly heated and indirectly heated respectively.



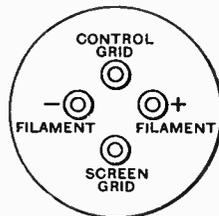
Battery and D.H. mains triode.



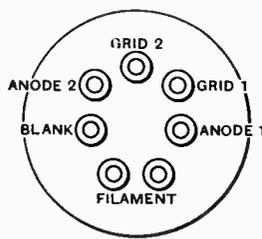
Battery and D.H. mains pentode (4-pin type, side terminal—space charge grid).



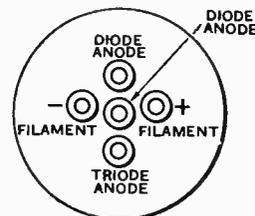
TOP CAP = ANODE  
Battery screened H.F. pentode.



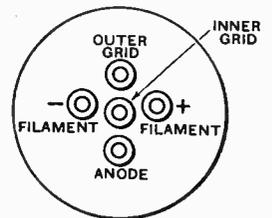
TOP CAP = ANODE  
Battery S.G. valve.



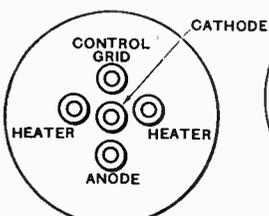
Battery Class "B" valve.



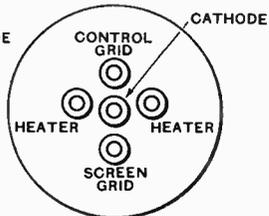
TOP CAP = TRIODE GRID  
Battery duo-diode-triode.



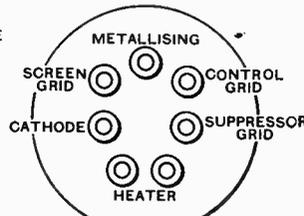
Battery bi-grid.



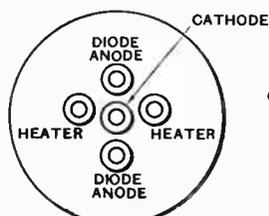
I.H. triode.



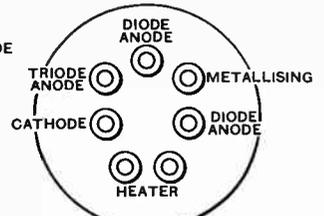
TOP CAP = ANODE  
I.H. S.G. and 5-pin H.F. pentode.



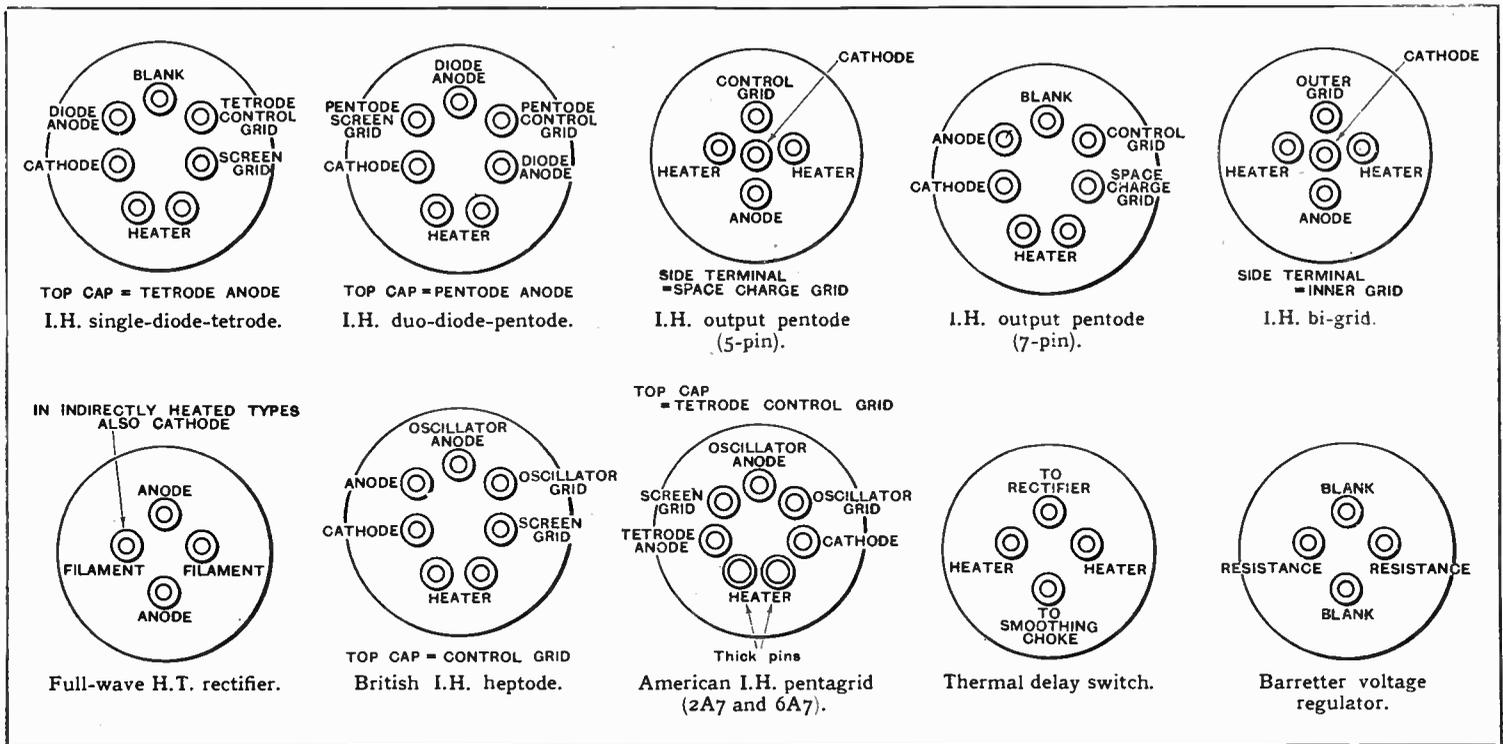
TOP CAP = ANODE  
I.H. screened H.F. pentode (7-pin).



I.H. duo-diode.



TOP CAP = TRIODE GRID  
I.H. duo-diode-triode.



## DISTANT RECEPTION NOTES

### Lucerne Plan in Dispute : Transatlantic Nights

IN common with the majority of long-distance enthusiasts, I believed that the station which has for some weeks been causing serious interference with the Huizen transmission (Hilversum programme) on 1,875 metres was a Russian. Information on the subject has now been received straight from the horse's mouth in the form of a letter from the *Nederlandische Christelijke Radio-Vereeniging*. The station responsible for causing the interference, they state, is a Roumanian, which "will not be completely finished for about two years, but is now conducting experimental broadcasts." The Director of the Hilversum programmes adds that his board may find it necessary to abandon 1,875 metres and use some other long wavelength if the interference continues.

At present the Roumanian station, whose experimental transmissions take place on most evenings, is using exactly the same wavelength as Huizen, with the result that the interference forms a wobbly and very unpleasant background.

Vienna's second aerial mast, work upon which has been in progress for some weeks, should be ready for action early next month. The station will then be able to use its full power at all times and excellent reception in this country should be assured.

#### Amsterdam Hopes

The meeting of the U.I.R., which opens at Amsterdam early in October, has been convened for the purpose of bringing the eight countries which did not sign the Lucerne agreement into the fold if possible. Whilst one earnestly hopes that the effort may be successful, the prospects of obtaining all of the desired signatures do not seem very bright at the moment.

Not a few people have asked me whether it is really important that the Lucerne Plan should come into operation. "Why not

leave things as they are?" they ask. "We are doing very well at present with thirty or forty stations available on most nights." The crux of the matter is that we have to look to the future. There are more than a dozen new stations—many of them of high power—to come into action within the next few months, and only by the adoption of



**THE ETHER POLICEMAN.** An informal picture of M. Raymond Braillard, the popular chief of the International Broadcasting Union's wavelength control post at Brussels.

the Lucerne Plan, which was drawn up with an eye to the future as well as to the present, can chaos be avoided on both the medium and the long wavebands.

Hamburg's new 100-kilowatt transmitter is nearing completion, and experimental broadcasts are likely to be heard shortly outside ordinary programme hours.

The upward movement of the optimum wavelengths for transatlantic reception continues, as I suggested some time ago that it might. A station that I heard only once or twice last winter, W.G.Y. on 379 metres, and then at poorish strength, is now

well received in the small hours on favourable nights. It will not be long, I believe, before we are regularly hearing W.J.Z., W.L.W., and others of the big U.S.A. stations with wavelengths above 350 metres.

The best long-wave stations at present are Radio-Paris, Zeesen, Luxemburg, and Kalundborg. Motala and Oslo, though usually strong, are both liable to suffer from heterodyne interference. Interference has also been noticeable with Athlone's transmissions. It is definitely not caused by any of the authorised stations working on wavelengths in that neighbourhood; it must therefore be due to one of the "illicit" transmitters, of which far too many are still at work. Of the medium wave stations, the best at the moment are: Langenberg, Hilversum, Prague, Rome, Brussels No. 1, Leipzig, Toulouse Midi, Breslau, Heilsberg, Nuremberg, and Milan. Bordeaux Lafayette, Munich, Genoa, and Florence are all worth attention. D. EXER.

### FOREIGN BROADCAST GUIDE

#### RADIO AGEN

(France).

Geographical position: 44° 15' N. ; 0° 37' E.

Approximate air line from London: 500 miles.

Wavelength: 453.2 m Frequency: 662 kc/s Power: 0.25 kW.

Standard time: Greenwich Mean Time.

#### Standard Daily Transmissions

12.30 G.M.T., Concert, news, talks; 20.00, concert 21.15, sporting news, etc.

Announcer: Man.

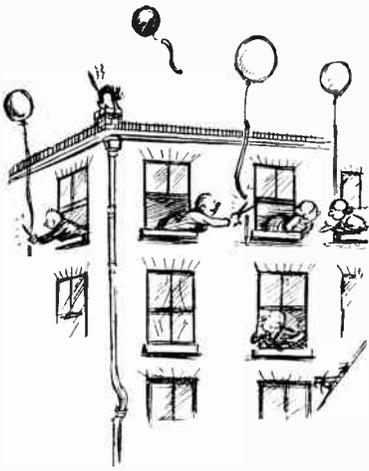
Call: *Ici poste départemental de Radio Agen en Lot et Garonne* (between items, *Ici Radio Agen*).

Closes down with usual French good-night greetings: *Bonsoir Mesdames, Bonsoir Mesdemoiselles, Bonsoir Messieurs*, followed by *La Marseillaise*.

# UNBIASED

By  
**FREE GRID**

## Publicity Pests



Getting rid of the nightmare.

## Sabotage in Salford

WHILE at the feeding troughs one day during my visit to the Manchester exhibition, I was chatting with a friend on the subject of screened down-leads. I was remarking that such things were of very little use to anyone who lived in a flat, when an obvious Mancunian who was sitting on the other side of me suddenly butted into the conversation with a strong denial of my assertion, and proceeded to explain that actually they were of more use to flat dwellers than anyone else. As proof, he cited his own particular circumstances.

It appeared that he lived about halfway up a tall tenement, and, but for a flash of genius for which Northerners are justly famous, would have had to be content with an indoor aerial. He had, he explained, obtained a small captive balloon for a mere song from a dealer in Government surplus stores and had at first used it to suspend a vertical aerial a few feet above the room. Unfortunately, however, as the down-lead came down alongside the wall to his window he lost most of the energy which was picked up aloft.

The aforementioned flash of genius had, however, inspired him to use a screened down-lead, with the result that, so far as wireless reception was concerned, he soon became the envy of the whole street. He was not long, however, without imitators, with the result that the whole roof area of the place was now literally bespangled with captive balloons, and open warfare had broken out among neighbours, who secretly cut each other's balloons adrift at night in order to get rid of the nightmare of mutual interference with tuning, which was so rampant.

## B.B.C. Please Note

I'VE never made any bones about revealing my opinion that the future of television lies in an electrical rather than in any mechanical system. It was, therefore, in a somewhat carping frame of mind that I recently accepted the invitation of a noted "televisionary" to come and have a look-in on the latest outfit.

The instrument was not home-made, as

I had anticipated, but was one of the latest type of mechanical radiosopes loaned to my friend on the assumption that his opinion on it was valued by the manufacturers.

We sat down in front of the instrument, and at a couple of minutes to eleven my friend stirred it into action in order to give the motor time to reach the speed at which the synchronising signal, when it came along, could hold it in step.

Eleven p.m. came and went, but still no synchronising signal, and my friend was soon perspiring freely, owing to the amount of juggling with the regulator control which was necessary to hold it at the correct speed until the start of the programme. At his invitation I took over the controls, but soon repented my hasty action, and began inwardly to curse the B.B.C. and all its works.

After a considerable delay the voice of the announcer blandly told us that it was six minutes past eleven, as if we didn't know it already, and then went on to intimate that, if we were good children, we should have a television demonstration *after a wretched reading had been waded through*. When it finally did come, the demonstration was much better than I had expected; indeed, I will even say that it was distinctly good, although it goes against the grain for me to have to admit it.

My enjoyment of the demonstration was completely spoilt, however, by my efforts to bottle up my wrath at the cavalier manner in which we television people are treated by the B.B.C. It isn't like an ordinary broadcast set where you can just switch on and wait, as it takes all the stuffing out of you to keep on juggling with the wretched thing until the synchronising signal comes on to take charge, as I know



Stirred it into action.

to my cost. In my opinion the B.B.C. should observe the same punctuality in regard to these matters as obtain at an execution.

A NEW menace threatens the sanctity of our homes. The other evening I was comfortably ensconced before the fire complete with pipe, carpet slippers, dressing-gown and loud speaker; Clapham and Dwyer had just got into their stride when the telephone bell rang, and as nobody else was at home I had to shuffle out of the room and answer it myself, feeling exceedingly annoyed at being interrupted at such an inopportune moment. Placing the receiver to my ear I was amazed to hear the voices of Clapham and Dwyer coming through, and I wondered if the rumour that the P.M.G. was to supply broadcast programmes to all telephone subscribers was true after all.



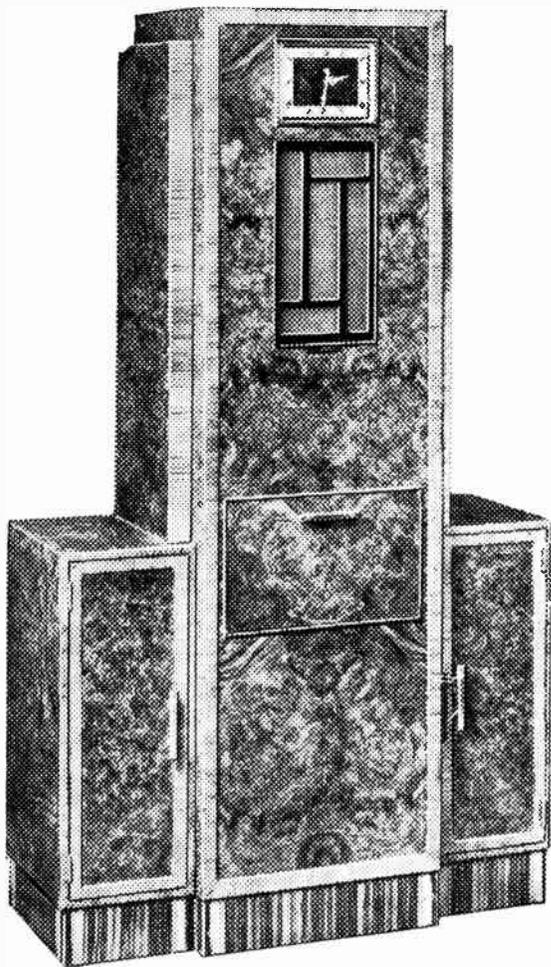
Had to answer it myself.

After a few moments the item abruptly ceased, and a distinctly non-B.B.C. voice informed me that I had been listening to an extract from a broadcast programme relayed from the showrooms of Messrs. Blank and Co., a departmental firm who had recently opened up in the locality; after further enjoining upon me the necessity of visiting their showrooms to buy a set, the caller rang off. I endeavoured to ring up the firm, but was told that the number was engaged, and subsequent attempts to get through to them later in the evening proved equally fruitless.

A personal call on the manager of the radio department the following day revealed why I could not get through. All the dozen telephone lines of the firm had been engaged throughout the evening in this publicity stunt.

The manager explained that only those items which were of a cheerful nature and at the same time were suited to the limited frequency characteristics of the P.O. telephone lines were relayed. Further conversation elicited the fact that it was becoming quite common for gramophiles to ring up their dealer for a telephone demonstration of a new record, and it was this practice which had given him his idea. If this sort of thing spreads, I suppose that when television is perfected we shall all face the alarming prospect of being rung up and having a mannequin parade forcibly thrust before our eyes.

# IDEAL CABINETS FOR THE NEW MONODIAL SUPER



The "C.A.C." GRANDFATHER CLOCK RADIO-GRAM CABINET.

This handsome and original piece of furniture represents the very last word in Radio-Gramophone Cabinet design. Intended to house an electric clock movement, it has provision for fitting, if desired, a pair of dual compensated Loud Speakers. Ample provision is given below the Speaker Grille to accommodate almost any type of Receiver, whilst the electric Gramophone Motor and Pick-up fit into the sliding drawer below. The two side compartments allow for the storage of a very large number of records.

In Burr Walnut, Mahogany or Oak, **16 Guineas.**

SEND TO-DAY FOR OUR 1933-34  
**ILLUSTRATED CATALOGUE**  
OF RECEIVERS, RADIO-GRAMS AND CABINETS.  
Also PRICE LISTS OF "WIRELESS WORLD" KITS including  
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and the  
**NEW MONODIAL SUPER.**



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CENTRAL STREET, LONDON, E.C.1.

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" 6206.  
" 6207.

Telegrams:  
"Cityacco, Barb, London."

"All Radio Dealers have customers who wish for something different, something better, and there is profitable business to be obtained by using the Cabinets sold by C.A.C." *"Scottish Radio Dealer," September, 1933.*

"But for really ornate work, commend me to the C.A.C., whose cabinets touch the hall-mark of class" *"The Nottingham Journal," 26th August, 1933.*

The originality of our Cabinet designs, the superb workmanship of our Receivers, and the generally high standard of our products were the outstanding features at the

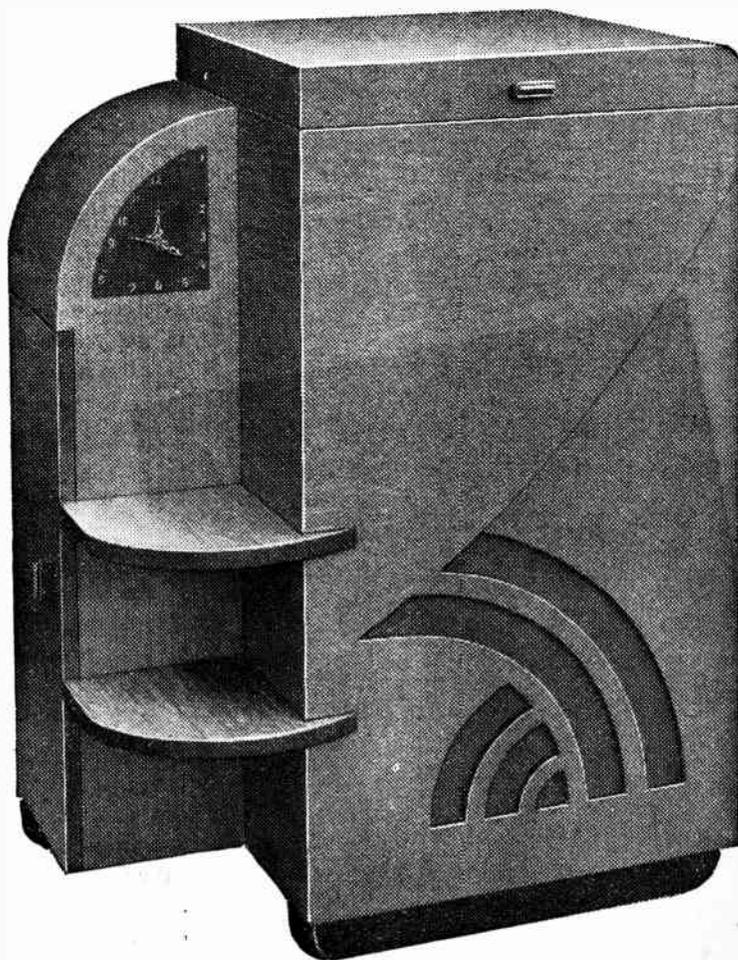
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Our products will be prominently displayed at the

**EDINBURGH RADIO EXHIBITION**  
**October 11th—21st**  
**WAVERLEY MARKET.**

Sole Agents for Scotland:—

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176, INGRAM STREET, GLASGOW.



The "C.A.C." COCKTAIL RADIO-GRAM CABINET.

This ultra-modern piece of furniture created immense interest at Radiolympia, where it was shown for the first time, and obtained for itself more press publicity than any other exhibit in the show. Provision is made for the accommodation of Combined Radio-Gramophone equipment, whilst on the left is fitted a spacious enclosed cupboard, admirably suited for a Cocktail Cabinet. Alternatively, it can be used as a storage compartment for Gramophone Records

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A FINE OPPORTUNITY FOR ALL READERS OF "THE WIRELESS WORLD" TO ACQUIR

# PRINCIPLES OF ELECTRICAL

General Editor: SIR AMBROSE FLEMING, F.R.S.

## A Challenge to Readers of "The Wireless World"

Part I of "PRINCIPLES OF ELECTRICAL ENGINEERING" contains, amongst many other interesting items, 45 photographs illustrating a wonderful series of laboratory experiments. We do not mind how deep your knowledge of Electrical Engineering, examine a copy of this part and we guarantee that you will be immediately interested and agree that this publication offers marvellous value for money. The more you know about Electrical or Wireless Engineering, the more you will appreciate this novel method of dealing with a fascinating subject.

## Knowledge Opens the Door of Opportunity

Progress is taking place at a rapid rate in many branches of Electrical Engineering, and Wireless Engineering in particular is one of those branches where progress is most rapid.

A clear grounding in fundamentals, given by one of the foremost authorities, Sir Ambrose Fleming, F.R.S., will be an immense help to you if you wish to keep in touch with this progress. There have been big opportunities in the past for well-informed men in the Radio Industry and there will be bigger opportunities in the future. The man who has this fundamental knowledge "at his finger tips" is in a position to make the most of his opportunities. Apart from the purely financial side, there is much real enjoyment to be obtained by acquiring further knowledge about a subject in which you are naturally interested.

As a reader of this Journal your interests obviously lie in the direction of Electrical and Wireless Engineering. That is why we have no hesitation in recommending you to purchase to-day a copy of Part I. We believe you will then be wise and place an order for the complete issue with your Newsagent.

## A Wonderful Record

Electrical Engineering and its sister industry—Wireless Engineering—are two industries which have maintained the prosperity during the depressing period through which we have just passed. This is surely a record of which they can justly be proud.

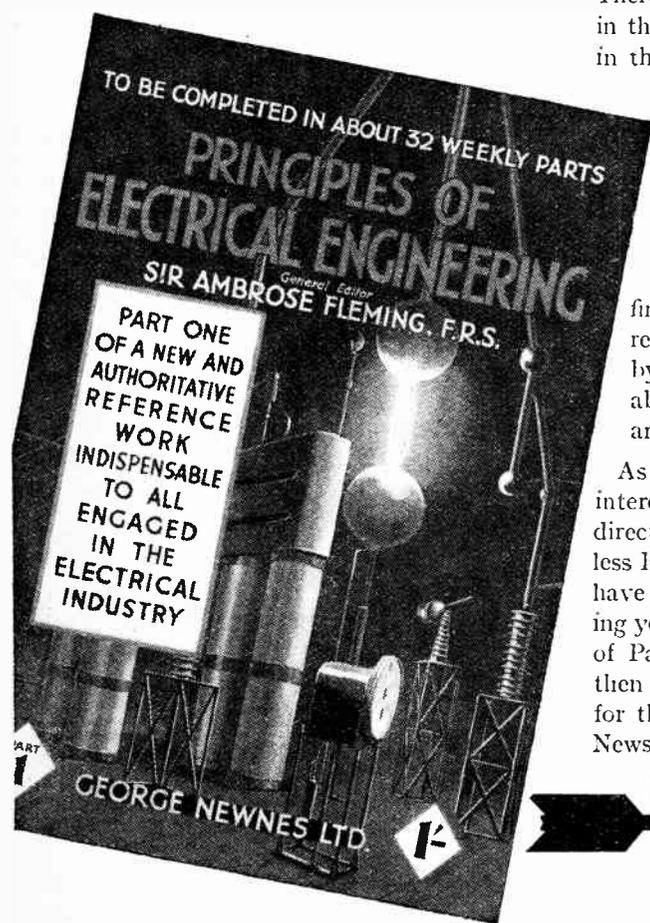
With the completion of the Grid scheme there is a new era of prosperity opening up for the Electrical Industry. There will be a need during the next few years for men who have a sound grounding in the fundamental principles.

In the domain of Wireless Engineering there is still much progress to be made. To take one example, intensive work is being conducted in connection with Television, and several new systems involving the use of Cathode Ray Oscillographs are at present being tried out. Any day some important discovery may revolutionise this branch of wireless activity, and the chances are greatly in favour of this discovery being made by a man who has a clear conception of the scientific research which has gone before. This information concerning fundamentals, which has necessarily to be treated very briefly in works devoted to the practical side, has been given special consideration in the present work.

## A UNIQUE OPPORTUNITY

You can buy a book on Electrical Engineering any day. This work is edited by one of our most eminent electrical engineers, written by some of the most successful men in the industry, and deals authoritatively with electrical engineering to-day. Such an opportunity only occurs once in a while and you must not miss it.

MAKE SURE OF SECURING THE COMPLETE WORK



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AUTHORITATIVE AND UP-TO-DATE WORK ON ELECTRICAL ENGINEERING

# ENGINEERING

Meritus Professor of Electrical Engineering to the University of London.

## and a Promising Future

There are already many books on electrical Engineering, but this new work unlike anything which has been published previously. It is written by men of the highest qualifications, many of whom have been closely associated with the development of the Grid scheme. Special pains have been taken by the Editor and contributors to ensure that every section can be readily understood by a person of average intelligence. Experiments never before shown outside a scientific laboratory have been illustrated by a wonderful series of photographs which present electrical Engineering as a fascinating study in place of a difficult technical treatise.

It is impossible here to give a complete list of the sections of this work, but readers may rest assured that every branch of the subject will be adequately dealt with by men who are in a position to give authoritative information. Whether the subject is Neon Lighting, the Cathode ray Oscillograph, the Thyatron, Automatic Telephony, the Mercra Lamp, or Alternating Current Work, you will find at the information given is clear, reliable, and absolutely up to date. You will find the purchase of this work one of the best investments you have ever made.

### IT WILL PAY YOU

Whatever branch of Electrical Engineering interests you—Radio, Electric Light Fitting, Telegraphy, Telephony, Power Generation or Distribution—a sound knowledge of fundamental principles will be an asset. This new work, written by experts, explains everything clearly. Hundreds of photographs and diagrams have been used to illustrate it. If you have the complete set of parts you will have a most valuable work which will be useful to you for years to come.

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## THE ONLY WORK OF ITS KIND

Possibly you have already read many books on Electrical Engineering. You will find that this new work is planned on entirely different lines from anything you have seen before. If you appreciate a straightforward, clear, and interesting treatment this is the work you will eagerly buy. Whether the subject is Designing a Burglar Alarm Circuit, Using a Photo-Cell, or Calculating the Windings for an Electric Motor, you will find that the treatment will make an instant appeal to you. The mathematical side is dealt with for the man who likes mathematics, but there is no need for you to be a mathematician to understand the articles.

## SPECIAL FEATURES IN PART I

A really wonderful series of photographs has been specially staged for this new work illustrating the fundamental principles embodied in the following important electrical appliances:—

- NEON TUBES**
- CATHODE RAY OSCILLOGRAPH**
- X-RAY TUBES**

Nothing to equal this wonderful series of photographs, which puts you right in touch with latest developments in three most important branches of the subject, has ever before appeared in any textbook. This article alone is worth far more than the cost of the part. Ask your Newsagent to show you a copy, you will surely agree.

## OF SPECIAL INTEREST TO WIRELESS ENGINEERS

This work has been prepared under the General Editorship of Sir Ambrose Fleming, F.R.S., who has a world-wide reputation in electrical and wireless circles. Naturally, Sir Ambrose has taken particular interest in those sections of Electrical Engineering which have a direct bearing upon wireless practice. He is contributing important sections to the work dealing respectively with the Valve, the Principles of Wireless Transmission and Reception, and the Principles of Short Wave Wireless.

### A STRIKING FACT

Do you realise that if it were not for the early researches of Sir Ambrose Fleming, which led to the discovery of the Fleming Valve, present-day Broadcasting might be non-existent.

This is not an exaggeration, it is a plain statement of fact. It is hardly necessary to emphasise the wonderful value offered in this work, which has been produced under the guidance of so distinguished a man and which contains several important contributions from his pen. Sir Ambrose, in addition to his scientific attainments, has the faculty of being able to present technical information in a wonderfully clear manner.

PART I NOW READY.  
ONE SHILLING  
WEEKLY

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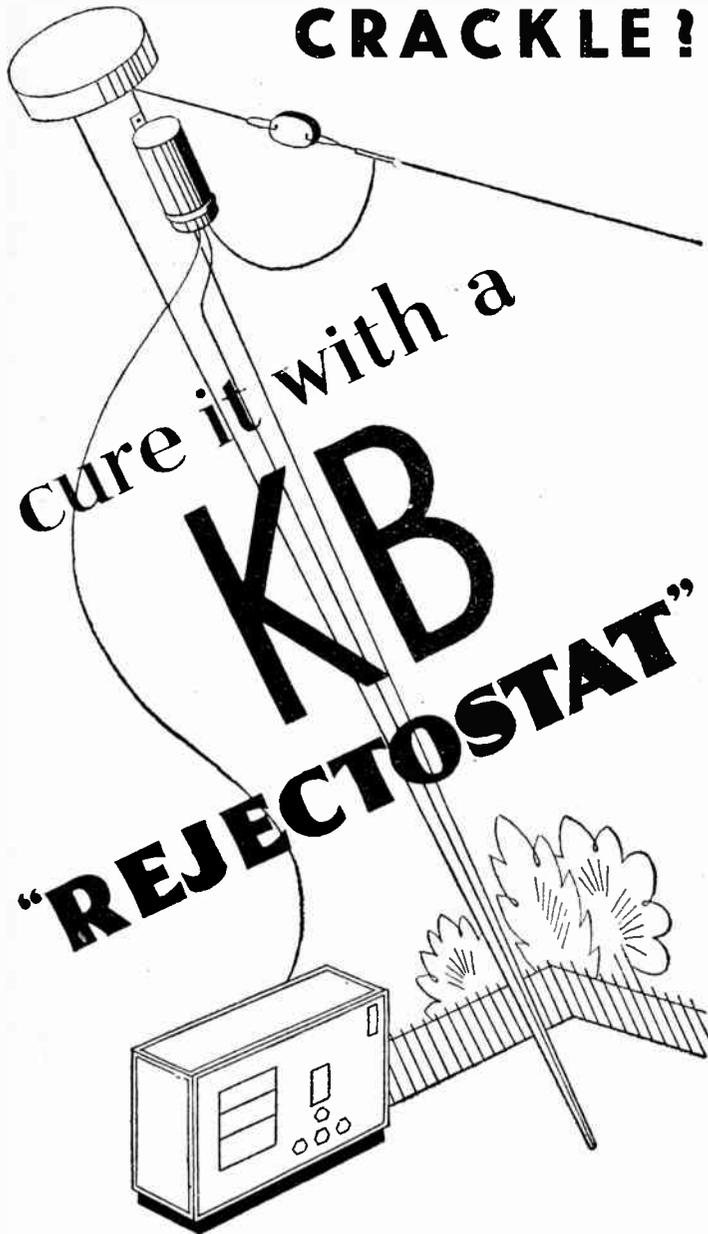
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"REJECTOSTAT"



The KB "Rejectostat" helps you to suppress those interfering noises caused by trams, signs, sweepers and other electrical machinery, *without any alteration to your set.* Ask your local KB Authorised Dealer how a KB "Rejectostat" can be fixed to your aerial.

KB "REJECTOSTAT" UNITS—£1. 5s. 0d.  
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Please send me full particulars of KB "Rejectostat"

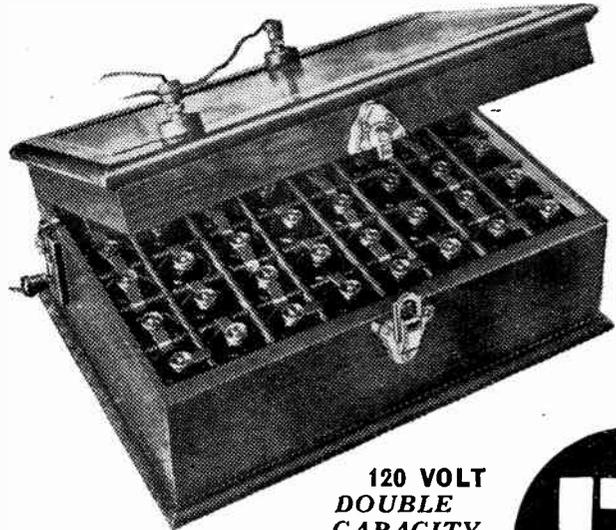
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# PRECISION UNIT CELL

## Revolutionises H.T. Supply



From Radio Shops or Direct for Cash or C.O.D. Money refunded if not satisfied.

120 VOLT  
DOUBLE  
CAPACITY

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### THE BATTERY THAT NEVER RUNS DOWN

The Precision Unit-Cell brings a definite saving on H.T. Costs within every one's reach. You are actually wasting money when you throw away an ordinary H.T. Dry Battery as unfit for further wireless use, because it is not really completely run down. Only a few cells are fully discharged, but this puts a strain on the good cells, making the complete battery useless.

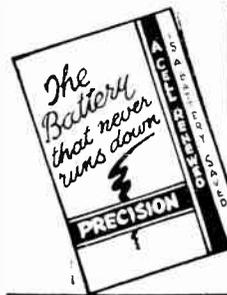
With the Precision Unit Cell each cell is removable and can be replaced for 2d. This ensures that the voltage is fully maintained, always.

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- 1 FIRST COST LOW—UPKEEP NEGLIGIBLE**  
The Precision Unit Cell, with more than twice the capacity of majority of Batteries, is low in first cost. The occasional replacement of a cell costs only 2d.—a truly negligible cost for perfect H.T.
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Each unit is separate. A patent device enables each cell to be removed in a few seconds, replaced or added to, and the cost is trivial. There is no soldering, no trouble, no loose connections. You set your own standard of voltage and maintain it without trouble, skill or excessive cost.
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Another special feature obviates the use of the Wander Plug. It is positive in action, secure in contact and takes only a fraction of a second to select a desired tapping.

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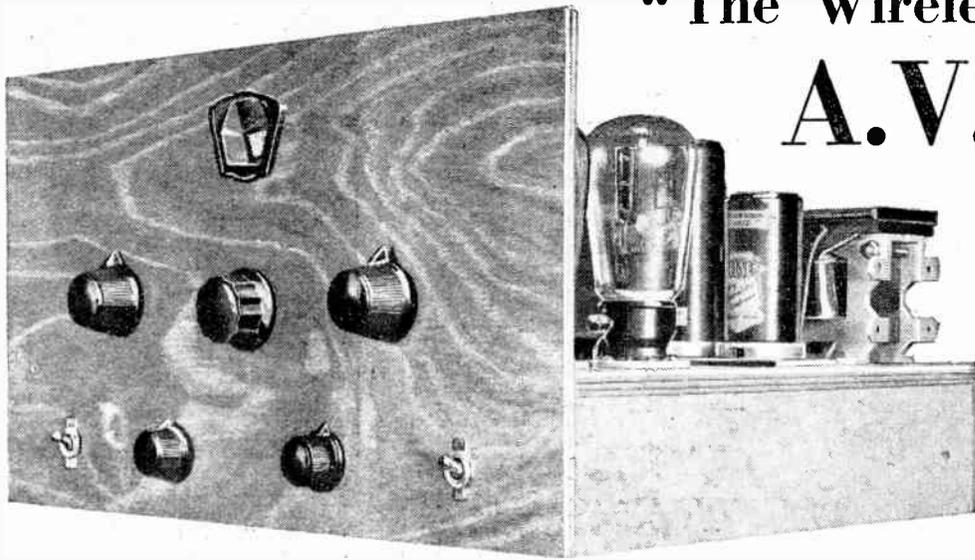
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## In Next Week's Issue

“The Wireless World”

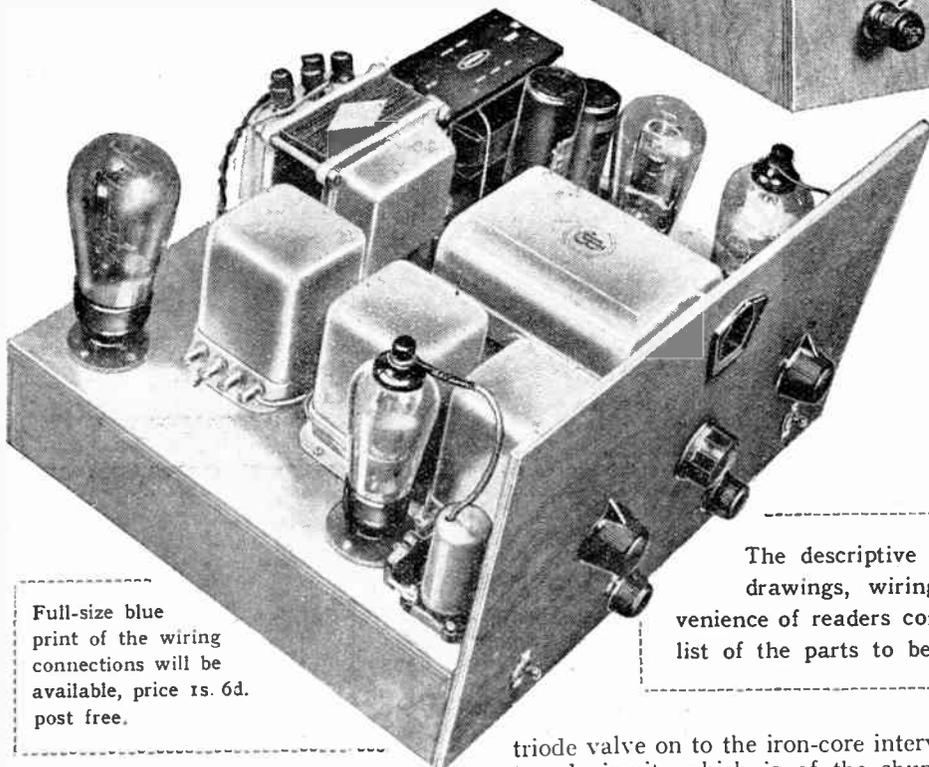
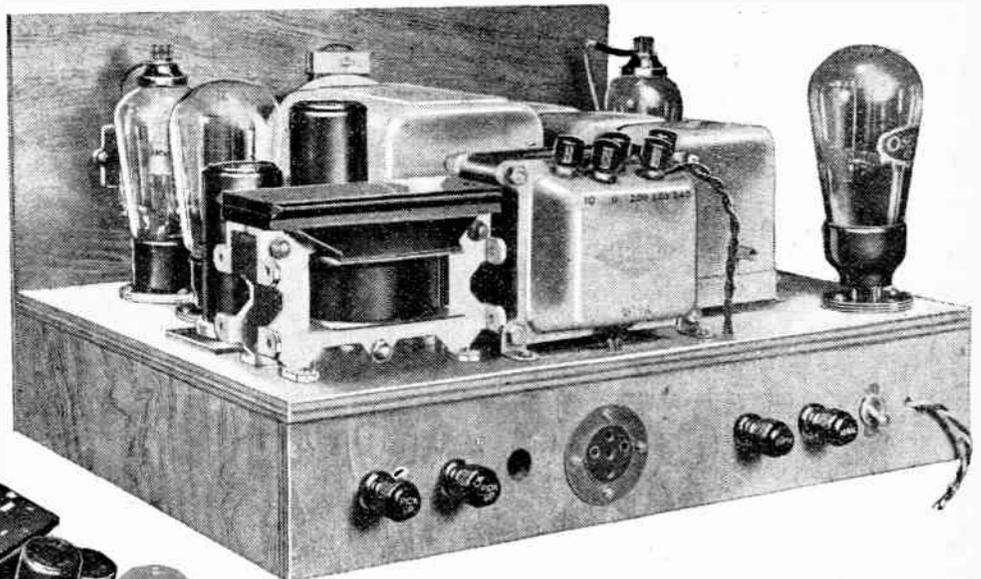
# A.V.C. Three

An Easily Assembled  
“Straight” Set Incorporating the Very Latest Design of Automatic Volume Control



**A**UTOMATIC volume control has hitherto been confined to the larger and more expensive class of receiver, and has found its chief application in the superheterodyne. One of the main difficulties in the way of fitting A.V.C. to a small, straight set has lain in obtaining simultaneously good A.V.C. action and reaction. These difficulties have now been overcome, and with the aid of the duo-diode-triode valve it is possible for the first time to construct a three-valve set which includes not only normally operating reaction but also delayed amplified automatic volume control.

The new receiver has a variable-mu screened H.F. pentode as the H.F. am-



Full-size blue print of the wiring connections will be available, price 1s. 6d. post free.

which enables any distortion introduced by reaction to be counteracted.

The output obtainable is 2,500 milliwatts, and the manual volume control is operative on both radio and gramophone. The smoothing equipment includes high-capacity electrolytic condensers in order to ensure hum-free operation from A.C. lighting mains.

The quality of reproduction reaches a high standard, and the volume obtainable is adequate for all normal requirements.

The descriptive article will be fully illustrated with circuits, drawings, wiring diagram and photographs. For the convenience of readers contemplating the building of this receiver a full list of the parts to be used will be found on page 294 of this issue.

plifier, and it is preceded by a band-pass filter employing iron-core tuning coils. Reaction is obtained from the duo-diode-

triode valve on to the iron-core intervalve tuned circuit, which is of the shunt-fed transformer type, and this stage is coupled to the output pentode by means of a tone-correction L.F. transformer

The sensitivity and selectivity are sufficiently high to permit reception at entertainment value of the principal Continental stations, even at short distances from high-power local transmitters.

# NEWS of the WEEK

## Current Events in Brief Review

### 150 Kilowatts from Oslo

THE Oslo Broadcasting Station will shortly double the existing aerial power of 75 kilowatts in time for the inauguration of the Lucerne Plan in January next.

### Incitement to Murder?

WHEN the Swanscombe Urban District Council was approached in regard to the noise from wireless sets in council houses, the clerk stated that this was a matter for the tenants themselves to take action.

### Bremen To-morrow

TO-MORROW sees the opening of the new Bremen relay station on a power of 1.5 kilowatts, *i.e.*, about six times the power of the existing transmitter. Bremen will work on a common wavelength of 227.4 metres with Flensburg and Hanover.

### Algiers on High Power

RADIO ALGIERS should obtain fresh fame next spring when its power is increased to 75 kilowatts. The local enthusiasts welcome the Lucerne Plan, which enacts that their station shall work on 318 metres and thus avoid the interference of Stuttgart and Barcelona. Only one thing remains to contribute to the general satisfaction, and that is the voting of the necessary credits by the French Government.

### Strasbourg, Too

YET another station is to increase its power, namely, Strasbourg, which it is claimed must work on a considerably higher output if it is to maintain its prestige.

### Camping Habit Spreads

GERMANY'S concentration camps are steadily filling up with persons who listen-in to broadcasts from Moscow. Moscow has lately been broadcasting a special Communist news service for Nazi Germany.

The strict censorship of news in the German press has increased the habit of tuning-in foreign news bulletins, but it would appear that in Germany to-day there are distinct dangers in reproducing anything Russian on the loud speaker.

### Radio-controlled Train

A "DUMMY" train operated by radio with the object of hoodwinking bandits is to be tested by the Japanese army in Manchukuo. It is planned to run the empty train at a distance of a quarter of a mile ahead of one fully manned by armed troops. It is expected that the bandits will fall upon the decoy train, to be fallen upon in turn by the Japanese troops. The idea should work, unless this copy of *The Wireless World* should reach the bandits before the experiment is tried.

### New Moscow Radio House

A COMPETITION has been organised for the best architectural designs for a new Radio House for Moscow. Eight prizes of 30,000 roubles each are offered.

### Helpful

"CAN you tell me what I can do to cut out interference from foreigners?"—Querist in a daily paper.

Answer: "The surest method is the purchase of another and more selective receiver."

### German Television Developments

TELEVISION at the 1933 Berlin Radio Exhibition is the title of a lecture to be given by Mr. Ernest H. Traub, at a meeting of the Television Society at University College, Gower Street, London, W.C.1, on Wednesday next, October 11th, at 7 p.m.

Cards of invitation for non-members of the society may be had on written application to Mr. J. J. Denton, 25, Lisburne Road, Hampstead, N.W.3.

### Lectures on Television

A COURSE of lectures on television has been started at the Borough Polytechnic, Borough Road, London, S.E.1, under the direction of Mr. J. J. Denton, A.M.I.E.E., hon. secretary of the Television Society. Lectures, which are illustrated by experiments and demonstrations, are given weekly on Thursdays from 8-9.30 p.m.

Full particulars of the course may be obtained on application to the principal of the Polytechnic.

### America's Radio Centre

LESS than two weeks after American broadcasting celebrates its thirteenth birthday on November 2nd, the National Broadcasting Company will inaugurate its elaborate new quarters in Rockefeller Centre, which will include what are claimed to be the largest and most completely equipped broadcasting studios in the world.

The formal opening date will be Tuesday, November 14th, when sixteen of the thirty-five studios will be employed in a great gala programme. One of the studios, which is called the Auditorium Studio, will be the largest in the world, measuring 78ft. x 132ft., and being three storeys in height.

It is understood that Sir John Reith, Director-General of the B.B.C., will be among those present at the opening ceremony.

### Anti-fading Aerials

VERY tall single masts are to be a characteristic of all German broadcasting stations in the near future, following upon the decision to use anti-fading aerials similar to that successfully tested at Breslau. Even Muhlackner,



THE COMPLETE "ULTRA-SHORT"—IST. Mr. A. E. Shaw ("Tuner" of the *Yorkshire Observer*) with his portable 5-metre receiving outfit on a Field Day.

Munich, and Leipzig, at present working with ordinary "T" aerials, will scrap their twin wooden masts and erect the single lattice tower necessary with the new ring-shaped antenna.

It is claimed that these aerials increase the local service area by from 20 to 25 per cent., but it is emphasised that the distant reception possibilities are not affected.

### Edinburgh's Radio Show

WAVERLEY Market, Edinburgh, will be the scene of the Fourth Annual Scottish Radio Exhibition, opening on October 11th. It is claimed that the exhibition is international in scope, as American and Continental sets will be on view. The B.B.C. is supporting the exhibition by installing a model studio, through the glass panels of which visitors to the exhibition will be able to watch a normal programme in course of presentation before the microphone.

The G.P.O. will also be represented with a replica of the Post Office exhibit at Olympia, London, dealing with the cause and prevention of electrical interference.

The exhibition will remain open from 2 to 10 p.m. each day until Saturday, October 21st.

### THE WIRELESS ENGINEER

Special Articles in the October issue:

#### NEW TYPES OF TRANSMITTING AERIALS

#### APPLICATIONS OF THE DYNATRON

Characteristics and operating conditions of the servon-grid valve used as a Dynatron.

#### S.G. VALVE AS SUPERHET DETECTOR

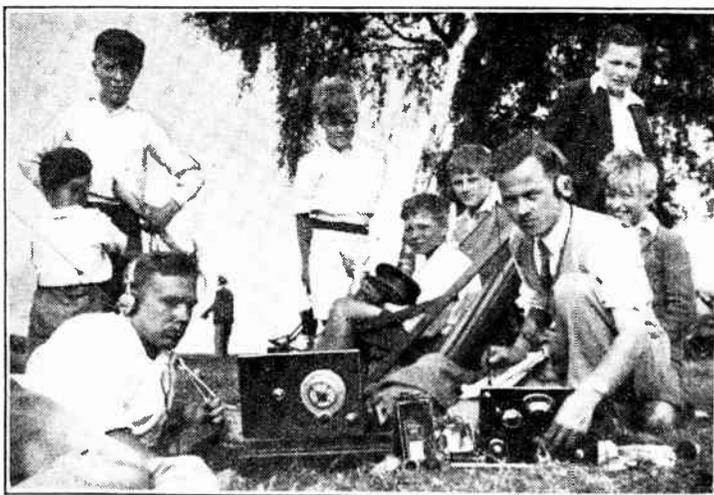
#### OLYMPIA 1933

A review of exhibits of special technical interest at the recent Show.

#### MEASURING RESISTANCES

The issue also contains monthly abstracts of the world's wireless literature and abstracts of recent patents.

Copies are now on sale, price 2/6, or post free from the publishers, 2/8.



KITE-FLYING WITH SHORT WAVES. Members of the International Short-wave Club on a recent successful Field Day at Parliament Hill. An effective aerial was suspended from a kite. Kite cord and aerial can both be seen in this picture.

### No Fairy Tales

THE Brazilian Government has forbidden broadcasting stations to transmit fairy tales for the children after dark, it being considered that stories of this kind may be over-stimulating to the youthful imagination.

A correspondent points out that it would be a good thing if the European stations were forbidden to broadcast the fairy tales which are normally intended for adult consumption throughout the evening.

### Broadcasting the "Fire" Trial

THE Recording Department of the German Broadcasting organisation have been busy throughout the Reichstag Fire Trial, and it is understood that the entire proceedings are being recorded for broadcasting purposes. Usually excerpts from the records are broadcast just before the News Bulletin each evening at 10 o'clock, all German stations participating.

# FOREIGN PROGRAMME SUPPLEMENT



## SUNDAY

OCTOBER THE EIGHTH

### ALGIERS

824 kc/s, 364 metres; 13 kW.—7.20 p.m., Accordion Music. 7.55, News. 8.0, Time Signal. 8.2, Symphony Concert. 8.35, Aria from La Juive (Halévy). 8.45, News. 8.50, Symphony Concert (contd.). 9.30, News. 9.35, Dance Music.

### ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—8.30 p.m., Time Signal. 8.31, Concert by the Station Orchestra. 8.50, Soprano Solos by Eileen Driscoll. 9.5, Gas—Sketch by Dorothy Day and Company. 9.35, Orchestral Concert (contd.). 10.0, Jack MacGarvey (Entertainer). 10.20, Pipe Solos by Sean O'Laoghaire; Gaelic Songs by Denis Cox. 10.50, Irish Music by the Station Orchestra. 11.0, Time Signal, News, Weather Report, and Close Down.

### BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—11.0 a.m., Chimes from the Cathedral and Weather. 1.0 p.m., Gramophone Music. In the interval at 1.30, Theatre Notes. 2.0, Sextet Concert. 3.0, Programme for Hospitals and other Benevolent Institutions, with Gramophone Records. 4.0 to 5.30, Interval. 5.30, Agricultural Talk in Catalan, followed by Gramophone Music. 6.0, Concert by the Station Orchestra. 6.30, Programme by Juan Roca. 7.0, Concert by the Station Orchestra. Soloist: Francesca Marlet (Soprano). 8.0, Dance Music, relayed from Hollywood Bar. 9.0, Extracts from Musical Comedies on Gramophone Records. 10.45, Chess Lesson. 11.0 (approx.), Close Down.

### BARI

1,112 kc/s, 269.8 metres; 20 kW.—9.0 a.m., See Rome. 9.30, Agricultural Talk. 9.45, Bible Reading. 10.0 a.m., See Turin. 11.30 a.m.—6.20 p.m., See Rome. 6.20, Announcements and Gramophone Music in Albanian, in honour of H.R.H. King Zog I of the Albanians. 6.30 till Close Down. See Rome.

### BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—5.55 p.m., Time and Programme Announcements. 6.0, Gramophone Music. 6.30, Talk. 7.0, Violin Concerto in D (Mozart). 7.30, Choral Concert of Popular Songs. 9.0, Time, Sports Notes, News and Gramophone Music. 9.40, Dance Music relayed from the Auto-Club.

### BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—5.0 a.m., Gymnastics, from Berlin (Funkstunde). 5.15, Press Review and the Day's Motto. 5.35, Concert from Hamburg. 7.0, Agricultural Talks. 7.45, Divine Service, from St. Mary's Church. 8.30, Mother and Child—Programme of Music and Literature. 9.5, Weather Report, from Berlin (Funkstunde). 10.0, Reading (Jacob Knipp). 10.15, Weather. 10.30, In a Rhinish Village Inn. 11.0, Military Band Concert, conducted by Willi Schoenfeld. 11.55, Time Signal. 12 Noon, Concert (contd.). 1.0, Radio Report of a Visit to the Young Hitlerites. 1.30, Children's Songs. 2.0, Karl Hans Strobl reads from his own works. 2.30, Ministering Spirits—Radio Sequence. 3.30, Concert, from Stuttgart. In an interval at 4.10 (approx.), Radio Report from the Brinsdorf Fair. 5.0, Dialogue: Race and Language. 5.20, Talk on Hermann Reich, on his Sixty-Fifth Birthday. 5.45, Sports Notes. 6.5, See Munich. 7.0, Wedding Celebrations—Topical Programme. 8.10, Concert by the Station Orchestra, conducted by Hellmuth Thierfelder. 9.0, News, followed by Radio Report. 9.45, Weather. 10.0, See Munich. 11.0 (approx.), Close Down.

### BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—10.30 a.m., Concert of Light Music by Hans Bunn and his Orchestra. 12 Noon, Part Relay of the Bach Festival from Langenberg. 12.30 p.m., Report of the Stunt Gymnastics from the Wintergarten. 12.40, Music from Die Fledermaus (Joh. Strauss) on Gramophone Records. 1.0 to 2.0, Talk for Garden City Dwellers. 2.15, Talk: Curiosities of Berlin. 2.30, Talk: The History of Coffee and Coffee-making. 3.0, Concert of Light Orchestral Music. In the interval from 4.0 to 4.10, Sports Report from the Sportpalast. 5.35, Choral Music by Brahms. 6.0, Radio Report of the Fieseler-Detroyat Stunt Flying Contest from Paris (on Gramophone Records). 6.30, Talk: Walking through Berlin—the Museums. 6.50, Sports Notes. 7.0, Lottery Announcements. 7.5, Kiinneke Programme—The Berlin Wireless Orchestra, conducted by the Composer, Charlotte Boerner (Soprano) and Walter Ludwig (Tenor). 9.0, News. 9.20 (approx.), Dance Music from the Eden Pavilion. In the interval from 10.0 to 10.10, Topical Talk. 12 Midnight, Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER. — See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

### BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Dyk: Selection from Gohann (Weinberger); Romantic Concerto for Pianoforte and Orchestra (Mars); Slovak Dance Suite (Mory). 4.30, Reading from Slovak Literature. 4.55, Concert of Light Music. 5.25, Talk. 5.40, Gramophone Music. 5.55, Hints for the Housewife. 6.0 to 10.0, See Prague. 10.0 (approx.), Close Down.

BREMEN.—See Hamburg.

### BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—11.0 a.m., See Langenberg. 12.30 p.m., Concert by the Silesian Philharmonic Orchestra, conducted by Hermann Behr. 2.30, Programme for Children. 3.0, Recital of Zielowsky Songs, with Wind Instrument accompaniment. 3.30, Reading: Friedrich and Rubezahl, a Tale about Frederick the Great. 3.50, Zither Duet Recital. 4.30, Talk: Women Welfare Workers. 4.50, Talk: Productions at the Lobtheater in Breslau. 5.0, Orchestral Concert, conducted by Walter Mundry. 6.20, Variety Programme. 7.30, Concert by the Station Orchestra, conducted by Rischka. 8.35, Topical Programme. 9.0, Time and News. 9.30, Concert by the Station Orchestra, conducted by Rischka. 11.0 (approx.), Close Down.

### BRNO

878 kc/s, 342 metres; 35 kW.—10.0 a.m., Concert by the Opus Choral Society. 11.0, See Prague. 11.15, See Moravsko-Ostrava. 12.30 p.m., See Prague. 1.0 to 1.15, Agricultural Talk. 3.0, See Bratislava. 4.30, Talk: South Arabia. 4.45, Gramophone Music. 5.0, German Transmission: Concert of Schrammle Music. 6.0, See Prague. 10.0 (approx.), Close Down.

### BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—10.0 a.m., Gramophone Concert. 11.0, Concert by the Small Station Orchestra. 12 Noon, Concert, relayed from the Grand Hotel, Antwerp. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Station Symphony Orchestra, conducted by Kumps. In the interval at 1.30, Scene from Sappho (A. Daudet) on Gramophone Records. 5.0, Concert by the Radio Orchestra, conducted by Franz André. 5.30, Football Results. 6.0, Pianoforte Recital by Mlle. Gaillard: Finale from the Italian Concerto (Bach); Un Sospiro (Liszt); Ballad in G Minor (Chopin); Prelude in G Sharp Minor (Rachmaninov); Triana (Albéniz). 6.30, Concert by the Vox Vocal Quartet. 7.0, Le Préludes (Liszt) on Gramophone Records. 7.15, Religious Address. 7.30, Wireless Notes and Music Review. 8.0, Les Noces de Jeannette—Opéra-Comique in One Act (Masse) by the Symphony Orchestra and Soloists. 8.45, Reading of Poems dedicated to Sport. 9.0, Concert by the Radio Orchestra, conducted by Franz André and the Gaudier Vocal Quartet. 10.0, Le Journal Parlé.

### BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—10.0 a.m., Concert by the Small Station Orchestra. 11.0, Gramophone Concert of Classical Music. 12 Noon, Concert by the Station Symphony Orchestra, conducted by Kumps. 1.0 p.m., Orchestral Concert, conducted by André Fellenau, relayed from the Grand Hotel, Antwerp. 5.0, Dance Music, relayed from the St. Sauveur Palais de Danes. 5.30, Sports Notes. 6.15, Selection from Sigurd Jorsulfar (Grieg), on Gramophone Records. 6.30, Concert by the Small Station Orchestra, conducted by Lecmans. 7.15, Religious Address. 7.30, Talk on Music. 8.0, Concert by the Radio Orchestra, conducted by Franz André. 8.45, Humorous Items by M. Remes. 9.0, Concert by the Symphony Orchestra, conducted by Kumps. 10.0, Review of Periodicals. 10.5 (approx.), Close Down.

### BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 7.25 p.m. till Close Down.—7.30 a.m., Divine Service Relay. 9.45, News. 10.15, Divine Service Relay followed by Concert by the Opera House Orchestra, conducted by Fridl. 1.0 p.m., Gramophone Concert. 2.0, Agricultural Talk. 2.50, Ethnographical Report. 3.40, Talk. 4.0, Concert by the Weidinger Orchestra. 5.0, Hungarian Song Recital. 6.0, Reading. 6.30, Pianoforte Recital by Szatmari. 9.10, Sports Notes. 9.25, The Blue Mazurka—Operetta (Lehár), followed by Dance Music by Len Baker and his Band from the Ritz Hotel; Soloist: Karl Vajda (Songs). 11.0 (approx.), Close Down.

CASSEL.—See Frankfurt.

### COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—7.0 a.m., Gymnastics for Women. 7.15, Gymnastics. 8.0 to 8.30, Talk. 9.0, Divine Service Relay. 10.30, Weather and News. 11.0, Town Hall Chimes. 11.2, Concert by the Radio Orchestra, conducted by Fritz Mahler. 12 Noon, Talk in English:

A Tour of Scotland. 12.20 p.m., Talk in German: The German Language Club and its Work. 12.40, Reading in French: Forêt voisine (Maurice Genevoix). 1.0 to 1.25, Interval. 1.25, Gramophone Music—Well-known Soloists. 1.55, Programme for Children—Choral Concert. 2.25, Offenbach Concert from the State Broadcasting Building. The Radio Symphony Orchestra, conducted by Emil Reesen. Soloists: Ingeborg Steffen-son, Mary Alice Therp, Willie Hagbo Petersen, and Marins Jacobsen (Songs). 4.0, (also on Skarnlebaek, 31.51 metres), Divine Service Relay. 5.20, Talk: The Moorish Element in Spanish Poetry. 5.50, Weather and News. 6.15, Time Signal. 6.30, Talk: Youth and Art—Visits to Exhibitions and Museums. 7.0, Town Hall Chimes. 7.2, Orchestral Concert, conducted by Launy Gröndahl. 7.30, Talk: Sport in English Literature. 8.0, Concert (contd.). 8.25, The Hansen Family—Humorous Episode (Jens Locher). 8.40, News. 8.50, Concert (contd.). 9.10, Recital of Lange Muller's Songs. 9.30, Concert (contd.). 10.0, Dance Music from the Ritz Restaurant. In the interval at 11.0, Town Hall Chimes. 11.30 (approx.), Close Down.

CORK.—See Athlone.

### CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Miscellaneous Announcements. 6.30, See Warsaw. 6.45, Programme Announcements. 6.50 to 8.15, See Warsaw. 8.15, Humorous Programme, relayed from Lwow. 9.15, Sports Notes. 9.25, See Warsaw. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

### FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12.30 p.m., Programme in English by the I.B.C. 11.0, Happy Hour; Part I: Orchestral Concert: Signature Tune; A Supper with Sappé (arr. Morena); Entrance of the Little Fauns (Pierne); Scherzo from A Midsummer Night's Dream (Mendelssohn); Violin Solo: Spanish Dance (Fallá); The Fairy Garden (Revel); Tambourin (Choinis (Kreisler); On the Edge of the Lake (Coates); Ballet from the Petite Suite (Debussy); Part II: Organ Recital; Overture, Poet and Peasant (Suppé); Schön Rosmarin (Kreisler); Who ate our Nell? A brown Bird singing (Haydn Wood); Minuet Antique (Wattling); Toccata from Suite Gothique (Boelli); Waltz Suite No. 3 (Coleridge-Taylor); Signature Tune. 12 Noon, Variety Concert: Louisiana Bayride; Street of Dreams; Some Other Bird; Alice Blue Gown; Copenhagen Blues; The Language of Love; Dancing Butterfly; Memins you; Melody; When the Red Red Robin; Lover come back to me; Twelfth Street Rag; Just a Little Street; Selection from The Music Box. 12.30, Programme in French. 2.30 to 7.30, Programme in English by the I.B.C. 2.30, Orchestral Concert: Signature Tune. The Night by the Sea; Selection from Music in the Air; I kiss your Lips (Rudolph); Fairy Tale (Heykens); Rose music (Bose); Egyptian Serenade, Amina (Lincke); Pianoforte Solo: When Day is done (de Sylva); Play of Butterflies (Heykens); Der Weg zum Herzen (Lincke). 3.0, Light Music: There's Something in your Eyes (Grothe); Songs: (a) Roll up the Carpet (Klages). (b) Throw open wide your Window (Galsdon); The Old Spinning Wheel (Hill); Song, Down in the Valley (Harrington); Xylophone Solo, Dance of the Marionettes (Gaston); Song, Reflections in the Water (Webster); In the Valley where the Waterbirds sing (Salman). 3.30, I.B.C. Members' Request Hour: Silver Threads among the Gold (Danks); Danny Boy (Weatherley); Leave the pretty girls alone (Robeson); Cello Solo, The Broken Melody (Van Biene); Around the Volga (Borchert); The Old Rustic Bridge by the Mill (arr. Wood); The Cuckoo Waltz (Jonas-

OCT. 8th **SUNDAY** continued

son); Selection from The Maid of the Mountains (Fraser-Simson); Signature Tune. 4.0, Judge Rutherford's Address. 4.15, The Nursery Corner. 5.0, Orchestral Concert: Baccarolle from The Tales of Hoffmann (Offenbach); Xylophone Duet, Dance of the Nymphs (Bich); Fairy Tale (Heykens); Selection from Carmen (Bizet); Serenata (Toselli); Xylophone Solo, The Clatter of the Clogs (Flynn); The Valley of the Poppies (Ancliffe); Le cygne (Saint-Saëns). 5.30, Military Band Concert: Classical Memories (Ewing); Scotland's Pride; Glow-worm Idyll (Lincke); Xylophone Solo, National Emblem (Bagley); Jungle Drums (Kettelbey); Selection from The Country Girl (Monckton); The Policeman's Holiday (Ewing); On the Quarter Deck (Alford). 6.0, Musical Comedy Music: Selection from Wild Violets (Stolz); Selection from White Horse Inn (Stolz-Benatzky); Wayside Rose from Frederica (Lehár); Selection from Chu Chin Chow (Norton); Song, Live for To-day (Fraser); I give my Heart, from The Diary (Müllöcker-Mackeben); One Alone, from The Desert Song (Romberg); Selection from The Merry Widow (Lehár). 6.30, Dance Music: Oh, Johanna! (Lawrence); Adorable (Whiting); Lazybones (Mercer); Let's call it a Day (Brown); There's a Cabin in the Pines (Hill); Sundown in a Little Green Hollow (Baskette); Seven Years with the Wrong Woman (Miller); Sweet Dreams Pretty Lady (Handley). 7.0, Concert: The Skaters' Waltz (Waldteufel); My hero, from The Chocolate Soldier (O. Strauss); Masquerade; The Porter's Love Song (Lomhard); The Village Band (Fryburg); All over Italy (Munro); Waltz Favourites (arr. Ancliffe); Liebestraume. 7.30, Programme in French. 9.0 till Close Down. Programme in English by the I.B.C. 9.0, Concert of Dance Music: Signature Tune, Happy Feet; Down in the Valley (Harrington); I cover the Water-front (Heymann); Roll up the Carpet (Hoffmann); P.C. 123 (Butler); My Gipsy Rhapsody (Lawrence); My Lucky Day (Parr-Davies); Reflections in the Water (Loeb); Happy Ending (Parr-Davies); Signature Tune, Happy Feet. 9.30, Tunes from the Talks: Signature Tune, Sitting in the Dark; Smiling through (Penn); I've found the Right Girl (Lupino); Sweetheart Darlin' (Kahn); Let me give my Happiness to you (Kosford); The Gold-Diggers' Song (Dubin); There'll still be Love (Marvel); There's Magic in the Air (Eyton); Why has a Cow got Four Legs? (Ellis); Signature Tune, Sitting in the Dark. 10.0, Gramophone Concert: Potted Overtures (arr. Engleman); My Ain Folk (Leman); The Clatter of the Clogs (Flynn); Sam's Medal (Hogan); Selection from The Flower of Hawaii (Abraham); Song, Castles in the Sand (Landford); A Radio Roundabout (Noack); Rosa mia (Guiza). 10.30, Concert of Dance Music: Moonstruck (Coslow); Sweep (Ellis); Learn to croon (Coslow); A Girl like Nina (Hammerstein); Alive for Love (Abraham); I always keep my Girl out late (Abraham); I'll show you (Abraham); Let's call it a Day (Brown); Lazybones (Mercer). 11.0, Variety Concert. Dance Music by Tommy Kinsmann and his Band (Electrical Transcriptions). Signature Tune, Happy Days are here Again; Everyone Says I Love You; Live, Love and Laugh (Heymann); The Way with Every Sailor; Black Eyes (Ferraris); My Baby said "Yes, Yes" (Kalmor); They all make Love but Me; Cuban Love Song (Fields); Just once for all Time (Heymann); Signature Tune, Happy Days are here Again. 11.30, Concert by the International Broadcasting Company (Ireland), Ltd., on behalf of Hospitals' Trust, Ltd. Signature Tune, Come Back to Erin; Overture, Mignon (Thomas); Caprice Viennois (Kreisler); Slav Dance, No. 10 (Dvorak); London-derry Air (arr. Grainger); Scarf Dance (Chaminade); Waltz from The Sleeping Beauty (Tchaikovsky); Hejre Kati (Hubay); Selection from I Pagliacci (Leoncavallo); Signature Tune, Come Back to Erin. 12.5 a.m. (Monday), Late News in English. 12.10 (approx.), Club Concert for Stafford Listeners. Signature Tune, The Chum Song; Adorable (Whiting); Tick Tack (Vienna); Oh, Johanna (Lawrence); My Lucky Day (Parr-Davies); Let's all be happy Together (Thomas); Spanish Sweetheart (Hargreaves); Avalon (Rose); It's Sunday down in Caroline; Nobody's Sweetheart (Kahn); It was a Night in June (Gordon); A Woman should stick to her Man (Hida); I raised my Hat (Frazz); My Bluebird's singing the Blues (Rohin); Twelfth Street Rag (Buday); Signature Tune. 1.0, Dance Music. Signature Tune, Bulls of Normandy; I wish I had Wings; Someone stole Gabriel's Horn; Have you had a Good Day To-day; I'm getting Sentimental over You; That's what Life is made of; I can't Remember; Somebody Stole my Gal; There's a Cabin in the Pines; Jog Along; Peter, Peter; There's a Light in your Window; In the Valley of the Moon; Hold Me; I've got the World on a String; One tiny Tear; You're mine You; My! oh my!; Signature Tune. 2.0, I.B.C. Good-night Melody and Close Down.

**FLENSBURG.**—See Hamburg.  
**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, 1,220 kc/s, 245.9 metres, and Trier, 1,157 kc/s, 259.3 metres.—11.0 a.m., See Langenberg. 12.30 p.m., Gramophone Concert. 1.0, Two Agricultural Talks. 1.10, Talk. 1.30, See Stuttgart. 2.30, Talk: The

New Architectural Style of the Dritte Reich. 3.0, Concert from Stuttgart. 5.0, Report of the Cassel Remembrance Day, 1933 (on Gramophone Records). 6.0, Humorous Interlude. 6.30, Sports Report. 6.40, Talk: The Sky in October. 7.0, Programme to be announced. 7.10, Verdi Concert to commemorate the Anniversary of the Composer's Birthday, October 10, 1813. The Station Orchestra, conducted by Rosband, and Soloists. 9.0, Time and News. 9.20, See Stuttgart. 9.30, Local News, Sports Notes and Weather. 9.45, See Stuttgart. 10.0, Variety Programme from Langenberg. 11.0, Gramophone Concert. 1.0 a.m. (Monday), Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

Call ha 806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—10.0 a.m., Festival Concert on the opening of the Radio Exhibition at the Alsterdamm. Overture, Poet and Peasant (Suppé); Invitation to the Dance (Weber); Military March in D (Schubert); Badenweiler-Marsch (Fürst). 10.30 (from Flensburg), Brahm's Festival, from the Deutsches Haus. The Municipal Orchestra and two Choirs. Conductors: Johannes Röder and Olaf Nissen. Soloist: Emmi Leisner (Alto); Rhapsody for Alto, Male Chorus and Orchestra. Tragic Overture. 11.0 a.m., See Langenberg. 12.30 p.m., Time and Weather. 12.35, Gramophone Concert of Light Music. 1.0, Programme for Young Hitlerites. 2.0, From Foreign Lands—Concert by the Station Choir, conducted by Gerhard Gregor. 2.30 (from Kiel), Youth-Orchestral Concert, conducted by Hans Döring. 3.30, Choral Concert in North German Dialect. 4.10, Talk on Animals. 5.0, Concert by the Station Orchestra, conducted by Fritz Gartz. 5.45, Mandoline and Vocal Quartet. 6.35, Sports Notes and Weather. 7.0, Wagner Concert, conducted by Richard Richter. News in the interval. 9.0, Time and News. 9.20, A Review of Political, Cultural and Artistic Events in North Germany. 9.35, Programme from Berlin (Funkstunde). 12 Midnight, Close Down.

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—10.30 a.m., Sonata in C Minor, Op. 111 (Beethoven). 11.0, See Langenberg. 12.30 p.m., Chamber Music on Gramophone Records. 1.0, Talk on Chess. 1.30, Talk for Young People. 2.0, Choral Concert. 2.30, Folk Tales and Anecdotes. 3.0, Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang (Brückner). In the interval at 4.0, Sports Notes. 5.0 (from Danzig), Reading from the Works of Wilhelm Raabe. 5.35, Song, Flute, Violin and Pianoforte Recital. 6.45, Sports Notes. 7.0, Request Concert by the Small Station Orchestra, conducted by Eugen Wilken. 9.0, News. 9.20 (approx.), Dance Music from Berlin (Funkstunde). 11.0 (approx.), Close Down.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m., and 20 kW. from 5.40 p.m.—8.40 to 11.40 a.m., Programme of the Workers' Radio Society (V.A.R.A.). 8.40, Pigeon Flying and Football Report. 8.43, Horticultural Talk. 9.10, Orchestral Concert. 10.0 (in the interval), Recitations. 11.10, Address. 11.40 to 4.40 p.m., Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.). 11.40, Gramophone Music. 12.10, Concert by the Wireless Orchestra. 1.40, Interview with the President of the Dutch Journalists' Association, on the Golden Jubilee of the Association. 2.10, Concert by the Choir of the Scala, Milan, relayed from the Concertgebouw, Amsterdam. Conductor: Veneziani. Programme of Sacred Music and Italian Folk Songs. 3.40, Concert of Light Music by the Octophonikers. 4.25, Sports Notes and Gramophone Music. 4.40 to 5.40, Programme of the V.A.R.A. Children's Hour. 5.40 to 7.40, Programme of the Liberal Protestant Radio Society (V.P.R.O.). 5.40, Book Review. 6.25, Divine Service. 7.40 till Close Down. Programme of the A.V.R.O. 7.40, Time and News. 7.55, Concert by the Wireless Orchestra, conducted by Nico Treep. Soloist: Cornelius van Munster (Tenor). 8.55, Gramophone Music. 9.10, Recital of Sacred Music by Jo Vincent (Soprano) and Frans Hasselaer (Organ). 9.40, Songs by the Fidelity Singers. 9.55, Gramophone Music. 10.10, Concert of Light Music by the Octophonikers.

10.50, Gramophone Music. 11.40, National Anthem and Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. (until 3.40 p.m.). Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—8.10 to 9.10 a.m., Programme of the Catholic Radio Society (K.R.O.). 8.10, Religious Programme. 9.10 to 11.10, Programme of the Christian Radio Society (N.C.R.V.). 9.10, Sacred Music on Gramophone Music. 9.30, Divine Service relayed from an Amsterdam Church. 11.10, Sacred Music. 11.55 to 4.40 p.m., K.R.O. Programme. 11.55, Concert by the Vienna Octet. 12.40 p.m., Talk: Legends. 1.0, Concert by the K.R.O. Orchestra. 1.50, Literary Talk. 2.10, Concert by the K.R.O. Orchestra. 2.40, Gramophone Music. Concert by the Vienna Station Octet. In the interval at 3.10, Gramophone Music. 3.40, The K.R.O. Orchestra, conducted by Gerritsen. Overture, La chasse du jeune Henri (Méhul); Petite Suite (Ducasse). 3.55, Programme for Invalids. 4.40 to 7.25, N.C.R.V. Programme. 4.40, Sacred Concert by a Women's Choir, conducted by Kloek. 5.30, Divine Service relayed from a church in Beilân. 7.10, Gramophone Music. 7.25 till Close Down: K.R.O. Programme. 7.25, Football Results. 7.30, Technical Talk. 7.55, Concert by the K.R.O. Orchestra, conducted by Gerritsen. In the intervals at 8.40 and 9.55, News. 10.20, Epilogue. 10.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, Sports Notes, and News. 8.15, Radio Concert. 9.0, News. 9.15, Concert (contd.). 10.0, Request Half-Hour. 10.30 till Close Down, Programme in English by the I.B.C. 10.30, Concert of Light Music: Tales from the Vienna Woods (Joh. Strauss); The Grasshopper's Dance (Jessel); Pianoforte Solo, Selection from The Cat and the Fiddle (Kern); Serenade (Heykens); Violin Solo, Souvenir (Drdla); Hungarian Melodies (Korhay); Hawaiian Guitars: Hawaiian Love; Wine, Woman and Song (Strauss). 11.0, Song Recital: When the Sergeant Major's on Parade (Longstaffe); I Give my Heart, from The Embarry (Müllöcker); Hold Me (Schuster); Selection from Cavalcade (Coward); The Old Spinning Wheel (Hill); Kashmiri Love Song (Woodforde-Finden); Orchestra: Musical Comedy Medley (arr. Hall). 11.30, Military Band Concert: Galety Echoes; Song, The Vicar of Bray (arr. Tait); A Merry Hunting Day (Partridge); Song, Ho, Jolly Jenkin, from Ivanhoe (Sullivan); Carry On (Dundas); Wood Nymphs (Contes); Parade of the Tin Soldiers (Jessel). 12 Midnight, Dance Music: Don't be late in the Morning; I can't remember; Drifting down the Shalimar; Maybe I love you too much; Moon Song; Isn't it romantic? Butterflies in the Rain; In the Valley of the moon; It's within your power; I'll see you in the Morning; Standing on the Corner; Waltzing in a Dream; I'm one of the Lads of Valencia; Let's put out the Lights; Let's all dance the Polka; When my little Pomeranian. 1.0 a.m. (Monday), Close Down.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—11.0, Twentieth German Bach Festival, relayed from the Congress Hall, Cologne. 12.30 p.m., See Stuttgart. 12.45, Musical Programme. 1.30, Programme for Children, from Stuttgart. 2.30, Duets, with Lute Accompaniment. 2.45, Programme for Children. 3.0, Concert from Stuttgart. In the interval from 3.15 to 3.40, Horse Racing Reports. 5.0, Variety Programme. 6.0, Radio Report from Paris, of the Fieseler-Detroyat Stunt Flying Contest. 6.30, Variety Interlude. 6.45, Sports Notes. 7.0 to 9.20, See Frankfurt. 9.20, Talk from Stuttgart. 9.30, General News. 9.40, Light Music and Dance Music. 11.0, See Frankfurt. 1.0 a.m. (Monday), Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m., Concert by the Leipzig Symphony Orchestra. 1.0 p.m., Weather and News. 1.5, Talk: The Programme of the Week. 1.25, Agricultural Notes. 1.35, Hallo—here's the Radio Zoo. 2.10, Choral Concert, relayed from Jena. 2.40, Talk: Down The Elbe. 3.0, Concert by the Leipzig Symphony Orchestra, conducted by Hilmar Weber. 4.30, Saving one's Neck—Humorous Radio Sequence. 4.50, Talk: The Oldest German Regiment. 5.20, Pianoforte Recital by Walter Bohle. 6.0, The Wine Harvest in Central Germany—a Radio Picture (Dr. Herbert Roth). 7.10, Verdi Concert, relayed from Frankfurt. 9.0, News. 9.30, Radio Report on Gramophone

Records: The Fieseler-Detroyat Stunt Flying Contest in Paris.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—3.30 p.m., Dramatic Programme. 4.30, Light Music. 7.0, Dance Music by the Station Orchestra. 7.30, Gramophone Music. 8.0, Songs and Guitar Solos. 8.30, Weather and News. 9.0, Dance Music by the Radio Jazz Band 10.0 (approx.), Close Down.

**LUXEMBOURG**

252 kc/s, 1,191 metres; 200 kW.—12.30 p.m., Variety Concert by the Station Orchestra conducted by Henri Pensis: Overture, The Bohemian Girl (Balfe); The Skaters' Waltz (Waldteufel); Selection from Aida (Verdi); Simple Chanson (Mammaert); Intermezzo, Coquette (Danjaume); Wedding Scenes (Smetana). 1.30, Gramophone Concert. 7.30 till 9.45, English Programme. 7.30, Symphony No. 5 in E minor, Op. 95—From the New World (Dvorak), by the Royal Albert Hall Orchestra conducted by Sir Landon Ronald (Gramophone Records). 8.25, Recital of Popular English Songs by Mme. Schaus-Arend. 8.50, News in French. 9.0, Concert of English Music by the Station Orchestra, 9.45, News in German. 9.55, Concert by the Station Orchestra, conducted by Henri Pensis; Selection from Madame Butterfly (Puccini); Frétillette (Wagner); Waltz, Dynamiden (Jos. Strauss); Selection from Orpheus in the Underworld (Offenbach). 10.30, Dance Music on Gramophone Records.

**MADRID**

ARANJUEZ, EAQ, 9,860 kc/s, 30.43 metres; 20 kW.—10.30 p.m., Concert of Light Music. In the interval at 10.45, Humorous Talk. 11.35, Talk. 11.45, Light Music. 12 Midnight till Close Down, Programme in English by the I.B.C. Concert by the International Broadcasting Company (Ireland), Ltd., on behalf of Hospitals' Trust, Ltd.; Signature Tune, Come back to Erin; Now I am in Love; Mama Ines; All through the Night; The Love Lieutenant; A South American Romance; Hawaiian Waltz Medley; Blues I love to sing; That's my Home; Signature Tune, Come back to Erin. 12.30 a.m. (Monday), I.B.C. Goodnight Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—8.0 to 9.0 a.m., Topical Review. 2.0 p.m., Chimes, Time, Theatre Notes and Popular Concert. 4.0 to 7.0, Interval. 7.0, Chimes, Radio Journal and Dance Music. 8.30 to 10.0, Interval. 10.0, Chimes and Time. 10.5, Concert and Dance Music. 12.30 a.m. (Monday), Chimes. 1.0 to 2.0 a.m. (Monday), Programme in English by the I.B.C. (Concert: P.C.123; The Skaters' Waltz (Waldteufel); A Woman should stick to her Man; Two Buck Tim from Timbuctoo; Black Eyes; Sweetheart Darlin'; At the Old Pig and Whistle; Stay out of my Dreams; Someone stole Gabriel's Horn; Viejo Ciego; Peter, Peter; I'm getting sentimental over you; The Rosary; One Tiny Tear; March from The Vagabond King (Friml); Let's all be happy together. 2.0, I.B.C. Goodnight Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—11.15 a.m., Concert by the Station Orchestra, conducted by Plichta. 12.30 to 1.15 p.m., See Prague. 3.0, See Bratislava. 4.30, See Prague. 10.0 (approx.), Close Down.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—2.0 p.m., Request Concert. 3.0, English Lesson. 3.30, Literary and Musical Review. 4.30, Radio Play for Young People. 5.30, Beethoven Concert by the Symphony Orchestra, conducted by Orlov; Soloists: Borovsky (Pianoforte), Furer (Violin), and Kunshevitzy (Cello). 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—10.0 a.m., Concert by the Station Orchestra, conducted by Winter. Soloist: Elizabeth Bisehoff (Violin). 11.0, Military Band Concert, relayed from the Feldherrnhalle. 12 Noon, Time, Weather and Programme Announcements. 12.10 p.m., Agricultural Talk: Cheese-making in the Allgäu. 12.30, Famous Singers on Gramophone Records. 1.0, Autumn in the Palatinate—Concert relayed from the Saalban, Neustadt. 2.30, Talk, relayed from the Daglight Racecourse. 2.45, A Play for Children. 3.15, Orchestral Concert. 4.30, Fritz Schätzler reads from his War Reminiscences. 4.50, Gramophone Concert. 5.25, Talk: On the Baltic Coast. 5.55, Introductory Talk to the Following Transmission. 6.5, Cavalleria rusticana—Opera in One Act (Mascagni) and I Pagliacci—

OCT. 8th **SUNDAY** continued

Opera in Two Acts and a Prelude (Leoncavallo), relayed from the National Theatre. In the Interval at 7.10, Weather and Sports Notes. 9.0, Time, Weather and News. 10.0, Dance Music. 11.0, Close Down.

NAPLES.—See Rome.

NOTODDEN.—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—9.15 a.m., Traffic Report and Weather. 9.20, Chimes from Trondheim, 605 kc/s, (495.8 metres). 9.30, Divine Service from Trondheim Cathedral. 4.0, Orchestral Concert. 5.0, Dramatic Programme. 6.15, Weather and News. 6.30, Talk: The Norwegian Society. 7.0, Time Signal. 7.2, Beethoven Concert by the Budapest Quartet: Quartets in B Flat, Op. 18 No. 6, E Flat Op. 74, and B Flat Op. 130; Grand Fugue, Op. 133. 8.0, Literary Talk. 8.30, Sports Notes. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Concert by the Station Orchestra. 10.0 (approx.). Close Down.

OSTERSUND.—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—9.25 a.m., Bible Reading. 9.40, Sacred Music. 10.5, Talk. 11.45, Giornale Radio. 12 Noon to 1.0 p.m., Concert of Light Music. In the interval at 12.30, Time, Announcements and Weather. 4.30 to 5.30, Gramophone Concert. 7.0, Dopohavro Announcements and Giornale Radio. 7.20, Sports Notes. 7.25, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Symphony Concert, conducted by La Rosa Parodi. In the interval, Talk. After the Concert, Light Music. 10.0, Giornale Radio.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—10.0 a.m., Gramophone Music. In the Interval at 10.20, Press Review. 10.30, Gramophone Concert. 11.0, Concert by the Station Quintet. 12.15 p.m., Sound Film Music on Gramophone Records. 12.45, Sponsored Programme. 12.50, Paul Weil in his Repertoire. 1.30, Gramophone Music. 2.0, Interval. 7.0, Le Journal Parlé. 7.5, Sports Talk. 7.15, Spanish Caprice (Rimsky-Korsakov), on Gramophone Records. 7.30, Catholic Address. 8.0, Gramophone Music. 8.30, Gramophone Music. 9.15, Le chapeau chinois—Play in One Act (Franc-Nohain). 9.45, Organ Recital—Maurice Durulé in a Programme of his own Compositions, with Instrumental Music by Boulez (Flute), and Villain (Viola). Prelude in E Flat Minor; Prelude, Recitative and Variations for Flute, Viola and Pianoforte; Variations on Veni Creator. 10.30, News.

**PARIS**

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.45 a.m., Gramophone Music. 8.0, Press Review and Weather. 8.30, Physical Culture. 12 Noon, Religious Address. 12.20 p.m., Sacred Music. 12.30, Gramophone Concert. 1.30 to 2.30, Programme in English by the I.B.C. 1.30, Concert of Gramophone Records: Danse (Granados) (recorded by La Argentina); Petite Suite de Concert (Coleridge-Taylor); Noce Bretonne (Williaume); Allegro Vivace, from the Roma Suite (Bizet); Violin Solo, Tambourin Chinois (Kreisler); Valse Tzigane (Zubalov); Slav March (Tchaikovsky). 2.0, Concert of Dance Music: Signature Tune, Happy Feet; There's no harm in Hoping (Connely); Lay your head on my shoulder (Campbell); Oh, Johanna (Hall); Sweet Dreams, pretty lady (Hanley); I've found the right girl (Gay); An Orchid for you (Revel); If I had somebody to love (de Rose); My Mother's Garden (Hanley); Signature Tune, Happy Feet. 3.0 to 3.30, Programme in English by the I.B.C. 3.0, Orchestral Concert: March, Boys of the Old Brigade (Barri); Opera Potpourri (arr. Bidgood); Selection from Lilaie Time (Schubert-Berté); Bird Songs at Eventide (Coates); Selection from Tom Jones (German). 5.30, Gramophone Music. 6.0, Light Concert. 7.0, Popular Concert. 8.0, Radio Paris Circus. 8.30, News and Weather. 8.45, Music Hall Programme by the Robert Macey Orchestra. In the interval at 9.15, Press Review and News. 10.0, Gramophone Music.

**PITTSBURGH**

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.86 metres, and 25.27 metres.—6.30 p.m., Old Songs of the Church. 6.45, Among the Masters. 7.0, Boys of Wynnecastle. 7.15, Int'l Radio Forum. 7.30 to 10.0, New York Relay. 7.30, Popular Concert. 8.0, National Opera Concert. 9.0, Gould and Sheffer. 9.15, Mirin Sisters. 9.30, Organ Recital. 10.0, Vesper Services. 10.30, Grand Hotel, from New York. 11.0, Pathé News. 11.15, Weather and Sports

Notes. 11.30, Happy Felton's Orchestra. 12 Midnight, Popular Programme. 12.30 to 2.45 a.m. (Monday), New York Relay. 12.30 a.m., Desert Guns. 1.0, Light Opera Nights. 2.0, Gulf Headliners. 2.30, Walter Winchell. 2.45, Marvellous Melodies. 3.0, Mountain Music from New York. 3.15, Anton Doinis, from New York.

PORSGRUND.—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—9.30 a.m., Programme for the Fiftieth Anniversary of the National Theatre. 10.0, See Brno. 11.0, Chimes. 11.5, News. 11.15, See Moravská-Ostrava. 12.30 to 1.15 p.m., Agricultural Programme. 1.15 to 1.25, Social Report. 3.0, See Bratislava. 4.30, Travel Talk. 4.45, Gramophone Music. 5.0, German Transmission: Review of the Music Programmes of the Czechoslovakian Broadcasting Stations, followed by Susanna's Secret—Opera in One Act (Wolf-Ferrari), by Members of the German Theatre. 6.0, News. 6.5, Topical Talk. 6.20, Talk on the following Transmission. 6.30, Turandot—Opera in Three Acts (Puccini), relayed from the State Opera House. 9.0, Time and News. 9.30, Gramophone Music. 10.0 (approx.). Close Down.

**RADIO-SUISSE ROMANDE**

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and Geneva, 395 kc/s, 760 metres.—8.55 a.m., (from Lausanne), Chimes. 9.0, Protestant Service, relayed from Neuchâtel. 10.0 (from Lausanne), Gramophone Concert. 11.30, News and Weather. 11.40 (from Lausanne), Gramophone Concert. 1.0 to 2.30, Interval. 2.30 (from Lausanne), Light Orchestral Music, relayed from the Hotel Splendid. 4.30 to 6.0, Interval. 6.0 (from Lausanne), Catholic Address. 6.30 (from Lausanne), Sports Report. 7.0, Concert by the Radio-Suisse Romande Orchestra, conducted by Echenard. Part I—Opera Music. 8.0 (from Lausanne), Chamber Music by the Hertel Quartet. 8.50, News and Weather. 9.0 (from Lausanne), Pianoforte Recital by Francis Lombriser. 9.30 (approx.). Close Down.

**REYKJAVIK**

250 kc/s, 1,200 metres; 21 kW.—11.40 a.m., Weather. 12 Noon, Divine Service. 4.30, Afternoon Concert. 7.45, Programme for Children. 8.30, Weather. 8.40, Musical Programme. 9.0, Chimes and News. 9.30, Reading. 10.0, The Kreutzer Sonata (Beethoven) on Gramophone Records, followed by Dance Music. 1.0 a.m. (Monday), Close Down.

RJUKAN.—See Oslo.

**ROME**

Call IRO, kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Bari, 1,112 kc/s, 269.8 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.45 p.m. and 2RO, 11,810 kc/s, 25.4 metres from 4.15 p.m.—9.0 a.m., News, Sports Notes and Amusement Guide. 9.30, Agricultural Notes. 9.45, Bible Reading. 10.0 to 11.0, See Turin. 11.30, Gramophone Music. 11.45, Sponsored Music. 12 Noon to 1 p.m., See Turin. 1.0, Time and Announcements. 4.0 (Naples), Programme for Children, Weather and Sports Notes. 4.15, Vocal and Instrumental Concert. Mary Luisa Sardo (Violin), Berenice Siberi (Mezzo-Soprano), Veola Capuano (Soprano), and Alfred Sernicoli (Tenor). Sports Notes in the interval. 5.30, Weather. 6.30, Sports Notes and News; Soprano and Mezzo-Soprano Duets. 7.0, Time and Announcements. 7.25, Sports Notes. 7.45, Operetta Programme. Reading in the interval. 10.0, Giornale Radio.

SALZBURG.—See Vienna.

**SCHENECTADY**

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—7.0 to 9.0 p.m. (approx.), New York Relay. 7.0, Gene Arnold and the Commanders. 7.15, Pop Concert. 8.0, Wayne King's Orchestra. 8.30, Radio Pulpit. 12.45 a.m. (Monday) to 3.45, New York Relay. 12.45, Popular Programme. 1.0, Variety Programme. 2.0, Popular Programme. 2.30, American Album of Familiar Music. 3.0, Variety Programme. 3.30, Impressions of Italy. 3.45, Sunday at Seth Parker's, from New York, followed by Programme Résumé.

**SCHWEIZERISCHER LANDESENDER**

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—9.0 a.m. (from Berne), Catholic Address. 9.45 (from Berne), Chamber Music. 10.20 (from Berne), Readings from Swiss Authors. 10.45 (from Berne), Popular Songs. 11.15 (from Berne), Gramophone Music. 11.30, Time, Weather and News. 11.40 (from Zürich), Concert by the Station Orchestra. 12.30 p.m. (from Berne), Concert by an Accordion Club. 1.0 (from Berne), Talk: Deciduous Trees. 1.30

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OCT. 8th **SUNDAY** continued

to 4.0, Interval. 4.0 (from Berne). Concert. 5.0 (from Berne). Anecdotes of the Sanatorium at Heiligenschwendi. 5.25 (from Berne). Gramophone Music. 5.30 (from Berne). Talk: Madame de Staël in Switzerland. 6.0 (from Berne). Time and Sports Results. 6.10 (from Berne). Gramophone Concert. 6.25 (from Berne). Talk with Illustrations: The Swiss Folk Song. 7.35. Concert by the Station Orchestra. 8.0, News. 8.20 (from Berne). The Dark Lady of the Sonnets—One Act Play (Bernard Shaw). 9.0 (from Berne). Dance Music. 9.20 (from Berne). Sports Notes and Close Down.

SOTTENS.—See Radio-Suisse Romande.

**STOCKHOLM**

669 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—8.0 a.m. (from Göteborg). Rural Programme. 8.30, Gramophone Music. 9.10, Talk for Workers. 9.30, Talk. 10.0, Divine Service Relay. 11.45, Weather. 2.0 p.m., Gramophone Music. 3.0, Elementary English Lesson. 3.30, Programme for Children. 4.5, Swedish Folk Song Recital by Edit Widmark-Lundblad. 4.25, Talk. 5.0 (from Göteborg). Evensonc. 6.15, Weather and News. 6.35, Concert by the Station Orchestra and Choir; Soloists, Greta Söderman (Songs) and Astrid Berwald (Pianoforte). 8.45, Weather and News. 9.0, Light Music by Georg Ender's Orchestra, relayed from the Bern Hall. 10.0 (approx.). Close Down.

**STRASBOURG**

669 kc/s, 345 metres; 11.5 kW.—9.30 a.m., Protestant Service in German. 10.30, Tercentenary Festival Programme of the Cession to France in the Thirty Years' War of the Towns of Bouxwiller, Neuwiller, and Ingwiller, relayed from Bouxwiller. 11.30, Catholic Service. 12 Noon, Gramophone Concert of Classical Music. 12.45 p.m., News. 1.0, Time. 1.1, Popular Music on Gramophone Records. 1.30, Interval. 2.0, Speeches, relayed from the Tercentenary Festival Programme at Bouxwiller. 3.0, Radio Report of the Arc de Triomphe Raet, relayed from Longchamp. 4.15, Agricultural Talk. 4.30, Symphony Concert by the Pasdeloup Concert Society, relayed from Paris. 6.30, Concert by the Parisien Trio; François Cholé (Pianoforte), Dany Brunschwig (Violin), and André Huvelin (Cello); Trio (Chausson); Trio (Ravel). 7.30, Time and News. 7.45, Sports Notes. 8.0, Press Review, Lottery Results,

and Announcements. 8.30, Bérénice—Tragedy in Five Acts (Racine), with Incidental Music by Rousseau. In an interval at 9.30, Press Review. 10.30, Dance Music, relayed from the Savoy.

**STUTTIGART**

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—10.15 a.m., Missa solenne (Boezi). 11.0, See Langenberg. 12.30 p.m., Topical Talk. 12.45, Gramophone Records of Popular Music. 1.15, Talk on Handicraft. 1.30, Programme for Children. 2.30, Men and Animals—Talk, with Illustrations from Works on Music. 3.0, Concert by the Station Orchestra, conducted by Otto Seyfert. 5.0, Military Band Concert, from London. 5.30, Oktoberlied—Programme of Songs and Recitations. 6.15, Sports Notes. 6.30, Violin Recital. 7.0 to 9.20, See Frankfurt. 9.20, Talk: You must know. . . . 9.30, Local News. 9.45, Gramophone Music. 10.0, Programme from Langenberg. 11.0, See Frankfurt. 1.0 a.m. (Monday). Close Down.

SUNDSVALL.—See Stockholm.

**TOULOUSE**

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—11.0 a.m., Dance Music. 11.30, Light Music. 11.45, Music from Opéra-Comique. 12 Noon, Symphony Music: Salomé's Dance (R. Strauss); Selection from Le roi malgré lui (Chabrier). 12.15 p.m., Chansonnettes. 12.30, Organ Solos. 12.35, Viennese Music. 12.45, Airs from The Magic Flute (Mozart) and La Favorita (Donizetti). 1.0, Amusement Guide and Market Prices. 1.5, Operetta Music. 1.15, Songs. 1.30, Accordion Music. 2.0, Airs from Opéra-Comique. 2.15, Military Music. 2.25, Agricultural Notes. 2.30, Extracts from The Barber of Seville—Opera (Rossini). 3.15, Orchestral Music. 3.30, Chansonnettes. 3.45, Balmusette Music. 4.0, Operetta Music. 4.15, L'Arlesienne (Bizet). 5.0, The Bamsant. 5.45, Viennese Music. 6.0, News. 6.15, Sound Film Music. 6.45, Choral Music. 7.0, Hunting Horn Music. 7.15, News and Racing Results. 7.30, Chansonnettes. 7.45, Orchestral Music. 8.0, Operetta Music. 8.15, Military Music. 8.30, Songs. 8.45, Hawaiian Guitar Music. 9.0, Operetta Music. 9.30, Concert by a Viennese Orchestra. 10.0, Opera Music. 10.15, North-African News

and Local Notes. 10.30, Programme for Listeners in Morocco. 11.0, Sound Film Music. 11.15, Musette Music. 11.30, Jazz Music. 11.45, Airs by an Argentine Orchestra. 12 Midnight, News, Weather, and Announcements. 12.5 a.m. (Monday), Orchestral Concert: German Dances (Mozart); Selection from The Good-humoured Ladies (Searlatt-Tommasini); Selection from Tiefland (d'Albert). 12.30 (approx.). Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—8.40 a.m., Giornale Radio. 8.55, Mass from the Cathedral of San Giusto. 10.0, Religious Address. 10.20, Agricultural Talk. 11.0 till Close Down. See Turin.

TRONDHEIM.—See Oslo.

**TURIN**

273.7 metres; 7 kW. Relayed by Milan, 331.5 metres; Genoa, 312.8 metres; and Florence, 500.8 metres.—8.40 to 8.55 a.m., Giornale Radio. 9.40, Agricultural Talk. 10.0, Mass from the Church of the Annunciation, Florence. 11.0 to 11.15, Religious Address. 11.30, Gramophone Music. 11.45, Sponsored Music. 12 Noon, Time and Announcements. 12.5 p.m. (approx.), Orchestral Concert. 3.30, Concert of Variety Music. 5.15, Weather and Gramophone Music. 5.30, Sports Notes. 6.0, Time, Sports Results, Dopolarovo Announcements and Gramophone Music. 6.10, Gramophone Concert. 7.0, Announcements and Sports Notes. 7.25, Introductory Talk on the following Transmission. 7.30, La Wally—Opera in Four Acts (Catalani). In the intervals: Talk, Theatre Notes and Giornale Radio.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,200 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 213.5 metres.—9.0 a.m., Bach Pianoforte and Organ Recital by Franz Schütz. Choral Prelude, Schmiecke dich, o liebe Seele; Second French Suite in C Minor; Prelude and Fugue in B Minor. 9.30, Talk in Dialect. 9.50, Chamber Music. Hans Kanesch (Oboe), Sigfried Siedner (Oboe), and Alexander Wunderer (Pianoforte); Sonata (Handel); Sonata (Fasch); Concerto

(Vivaldi). 10.20, Religious Programme. 11.0, Concert by the Wiener Symphoniker, conducted by Anton Konrath. 1.0 p.m., Report on Gramophone Records of the International Riding and Jumping Contest, from the Prater Polo Ground. 1.10, Time and Announcements. 1.30, Inauguration of the New Organ in the Parish Church of Gross-Weikersdorf. 2.15, Agricultural Talk. 2.35, Book Review. 3.0, Concert by the Galimir Quartet. String Quartet in F. (Mozart); Introduction and Fugue on a Theme of Paul Juon, Op. 12 (Langstroth); String Quartet in C. Op. 37 (Szymanowski). 4.0, Talk: With the Last Coral Fishers of the Adria. 4.25, Concert by Wilhelm Wacek and his Wind Instrument Orchestra. 5.30, Talk: Gorch Fock, the Man and his Work. 6.0, Instrumental Concert. Anton Kamper (Violin), Scuta Benesch (Cello) and Jakob Gimpel (Pianoforte). In an interval at 6.35, Time and Weather. 7.0, Bunter Abend. The Wiener Symphoniker, conducted by Josef Holzer, and Soloists. 9.0, Announcements. 9.15, Dance Music on Gramophone Records, followed by Announcements.

**WARSAW**

212.5 kcs, 1,411 metres; 120 kW.—8.0 a.m., Time Signal and Sacred Music. 8.5, Gymnastics. 8.20, Gramophone Music. In the interval at 8.35, Radio Journal. 8.52, Hints for the Housewife. 8.55, Programme Announcements. 9.0, Divine Service, relayed from Lwów. 9.45, Sacred Music on Gramophone Records. 10.57, Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Programme Announcements. 11.10, Weather. 11.15 Concert by the Philharmonic Orchestra, conducted by Oziminski. 12 Noon, Talk. 1.0 p.m., Agricultural Talk. 1.15, Agricultural Prices. 1.20, Gramophone Music. 2.0, Agricultural Talk. 2.20, Announcements. 2.25, Concert by a Village Orchestra. 3.0, Programme for Children, relayed from Lwów. 3.30, Violin Solos by Szigeti on Gramophone Records. 3.45, Reading. 4.0, Talk for Women. 4.15, Popular Programme, relayed from Lwów. 5.0, Programme to be announced. 5.40, Mezzo-Soprano Song Recital. 6.5, Miscellaneous Items. 6.30, Review of the Week's Events, for Young People. 6.45, Programme Announcements. 6.50, Radio Journal. 7.0, Concert by the Station Orchestra, conducted by Nawrot. 8.0, Topical Talk. 8.15, Humorous Programme, relayed from Lwów. 9.15, Sports Notes. 9.25, Dance Music. In the interval at 10.0, News, Weather and Police Notes. 10.30, Close Down.

ZURICH.—See Schweizerischer Landessender.

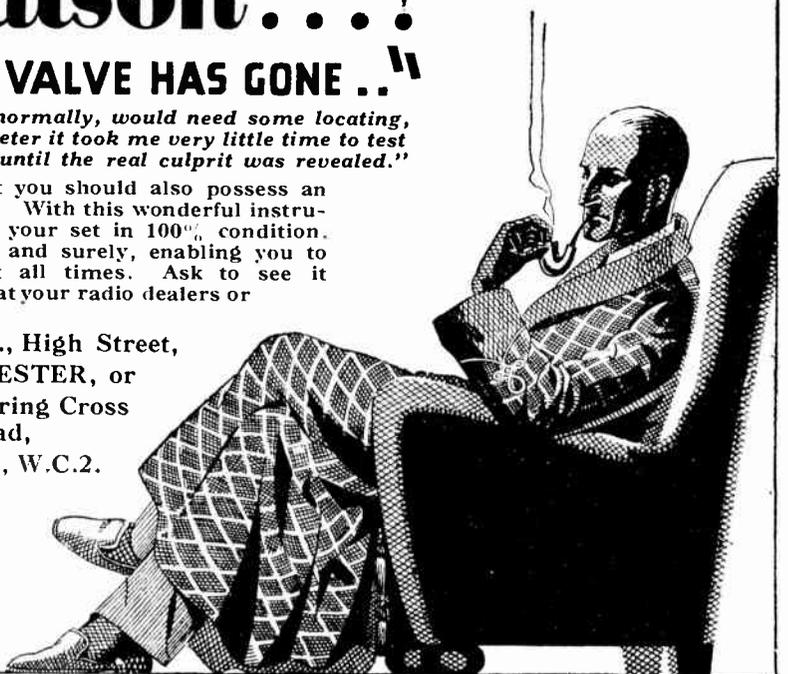
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# MONDAY

OCTOBER THE NINTH

## ALGIERS

824 kc/s, 364 metres; 13 kW.—7.20 p.m., Songs from Sound Films. 7.55, News. 8.0, Time Signal. 8.2, Lottery Results. 8.10, Symphony Concert: Symphony in D (Mozart). 8.35, News. 8.40, Aria from The Barber of Seville (Rossini). 8.45, Symphony (contd.): Spanish Symphony for Violin and Orchestra (Lalo); Les Préludes (Liszt). 9.25, News. 9.30, Instrumental Solos. 9.55, News.

## ATHLONE

725 kc/s, 413 metres; 60 kW.—Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Report and Gramophone Music. 6.0, Programme for Children. 6.45, News. 7.0, Gaelic Talk. 7.15, Recitations of Poems by John Stephen. 7.30, Time. 7.31, Concert of Opera Music by the Station Orchestra. 8.0, Operatic Songs by H. J. McCormick (Bass). 8.15, Literary Talk. 8.40, The Station Orchestra. 8.55, Soprano Solos by Jean Nolan. 9.15, Piccolo Solos by Mollie Flynn. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Concert of Dance Music. Little Sunshine (Krauss); Everyone says I Love You (Kalmán); Argentina Moon (Elkins); Shuffle off to Buffalo (Dubin). 9.45, Pianoforte Concert. Etude in A Flat (Chopin); Musical Box (Poushinov); Berceuse (Faure); Country Gardens (Grainger); Wireless World Announcement. 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of Hospitals Trust, Ltd. My Wishing Song (Kahal); You've got me Crying Again (Newman); I want to go Home (Sanders); The Moment I saw You (Gay); Racing Commentary; What have we got to Lose? (Kent); No more Love (Friend); Maybe I love you too Much (Berlin). 10.30, I.B.C. Good-night Melody, followed by News and Weather. 10.40, Music by the Fintan Lator Pipe Band. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Military Polonaise (Chopin); Minuet (Massenet); Piece (Chaminade); Selection from Norma (Bellini); Rondo on a Theme of Beethoven (Tavan); Serenade (Boland); Selection from Le roi d'Ys (Lalo). 7.0, Request Gramophone Records. 7.20, Sports Notes. 7.30, Exchange and Talk in Catalan. 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices. 9.5, Humorous Review of the Week in Verse. 9.15, Concert of Sardanias. 10.0, Concert by the Station Orchestra. 11.0, News and Dance Music, relayed from the Casa Llibre. 12 Midnight (approx.), Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—11.30 a.m. to 1.0 p.m., Concert by the Radio Quintet. 1.0 to 3.30, See Rome. 3.30, Gramophone Music. 3.55 to 5.35, See Rome. 5.35, News in Albanian. 5.45 (approx.) till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—5.55 p.m., Time and Programme Announcements. 6.0, Talk. 6.30, Viola Recital by Johan Zorko; Sonata in G (Marcello); Sonata in D (Ariosti); Sonata in G (Bach); Romance in F (Beethoven). 7.30, Rigoletto—Opera (Verdi) on Gramophone Records. In an interval at 9.0, Time and News.

## BERLIN

DEUTSCHLANDSENDER (REICHSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—11.5 a.m. (approx.), Famous Composers—Gramophone Concert: Wilhelm Furtwängler. The Death of Isolde from Tristan and Isolde (Wagner); Leopold Stokovsky. The Nutsacker Suite (Tchaikovsky); Richard Strauss, Trio and Finale from Der Rosenkavalier (Richard Strauss); Willem Mengelberg. Overture, Egmont (Beethoven); Erich Kleiber. Danse macabre (Saint-Saëns). 11.55, Time Signal. 12.45 p.m., News. 1.0, Gramophone Records of Enrico Caruso: Beim Licht des Mondes (Anton); Aria from Il Trovatore (Verdi); Aria from Faust (Gounod); Aria from Ma non (Massenet); Aria from La Bohème (Leoncavallo); Melody (de Crescenzo); Aria from Tosca (Puccini); Overture, Mignon (Thomas); Selection from Masaniello (Auber); Sailors' Chorus from The Flying Dutchman (Wagner); Hungarian Rhapsody No. 1 in F (Liszt). 2.0, Talks for Women. 2.30, Weather and Exchange. 2.45, Review of Books. 3.0, See Breslau. 4.0, Talk. Town Children. 4.25, Modern Music by Gustav Cords by the Station Orchestra, conducted by the Composer, Gustav Cords. Soloist, Fred Drissen (Songs); Suite in Old Style (Gustav Cords); Songs (Richard Strauss); (a) Ruhe meine Seele. (b) Ach weh mir unglückhaftem Mann. (c) Nachtgesang. (d) Freundliche Vision. (e) Selbsteck. Wetter. (f) Traum durch die Dämmerung. (g) Ständchen. 5.0, Poems. 5.5, Talk. 5.25, Talk: Sport for Young People. 5.45, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, Today's Motto. 7.5, A Journey (on Gramophone Records). 8.0, Dancing for the Coming Winter—Dance Music with Commentary. 9.0, News, followed by Report of the Training of Five Hundred Boys for the

Olympic Games in the German Stadium. 9.45, Weather. 10.0, Concert from Hamburg. 11.0 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—3.45 p.m., Concert by the Station Orchestra, conducted by Helmar Kähler: Prelude to the Second Act of Herzog Philipps Brautfahrt (August Reuss); German Folk Song Fantasia, Op. 72 (Theodor Blumer); Waltz and Cradle Song (Franz Friedl); Wedding Music, Op. 54 (Kretzschmer). 4.30, Talk on his Experiences by Hans Bertram the World Flyer. 4.50, Honour Labour—Radio Sequence (Hans Rehberg). 5.10, Pianoforte Recital: Chaconne in F Minor (Pachelbel); Variations on the Italian Folk Song, Vien' ça dorina bella (Weber). 5.30, The Funktunde informs its Listeners. 5.45, Topical Talk. 6.0, Transmission for all German Stations relayed from Heilsberg. 7.0, Lottery Announcements. 7.10, See Langenberg. In an interval from 7.55-8.30, From another World—Encounters with the Supernatural. 9.0, Weather and News. 9.15 (approx.), Dance Music from the Tiergarten. In the interval from 10.0-10.5, A Warning by the Chief of Police. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.5 p.m., Organ Recital from the Franciscan Church: Fantasia from the Sonata in A, Op. 188 (Rheinberger); Festival Prelude in D (Springer); Improvisation on a Theme from Bruckner's Mass in F Minor (Messner). 4.35, Talk: Education in Manners at Home and at School. 4.45, Gramophone Music. 5.10, Talk. 5.25, Divertissement for Violin, Viola, and Cello (Mozart). 5.55, Hints for the Housewife. 6.0, See Prague. 6.10, See Brno. 6.25, See Prague. 7.5, The Lighthouse Keepers—One-Act Play (Antier and Cloguennin). Translated from the French by Jesensky. 7.30 to 9.15, See Prague. 9.15 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW.—Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—1.10 p.m., Pianoforte Recital. Sonata in E (Handel); Sonata in G Minor (Schubert). 1.30, Gramophone Concert of Songs and Choral Music. 2.0, Market Prices. 2.15, Review of Books. 2.35, Talk: The Heavens in October. 3.0, Concert by the Station Orchestra, conducted by Rischka. Overture, The Nuremberg Doll (Adam); Selection from Czar and Carpenter (Lortzing); Suite for Orchestra No. 2 (Richtka); Waltz from The Sleeping Beauty (Tchaikovsky); Three Pieces (Grieg): (a) A Wedding Day on Troldhaugen, (b) Lied der Bauern, (c) Erotika Veil intermezzo (von Schillings); Waltz, Bei uns z'Haus (Joh. Strauss). 4.30, Market Prices. 4.32 (approx.), Review of Politics and Topical Events. 4.50, Topical Talk. 5.10, Violin Recital. Spanish Dance (Granados); Sonata in E Minor (Paganini); Polonaise in A (Wiennawski); Hungarian Rhapsody (Hauer). 5.30, Talk: The Peasants Property Law. 5.50, Meat Market Prices. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, News. 7.10, Chamber Music, conducted by Prade. 7.40, Reading (Otto Weddigen). 8.0, Dance Music by the Station Orchestra, conducted by Topitz, and the Songs by Lotte Leffler (Soprano). 9.0, See Munich. 9.20, Time and News. 9.45, Wireless Technical Talk. 9.55, Dance Music by the Station Orchestra conducted by Ernst Topitz with Songs by Lotte Leffler (Soprano). 11.0 (approx.), Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—6.10 p.m., Musical Talk. 6.25, Fucik Concert by the Station Orchestra, conducted by B. Bakala: March, Entry of the Gladiators; Waltz, Frühlingsbotschaft; St. Hubert Overture; Bells of Prague; Humorous Polka for Bassoon; Waltz, Winterstürme; March, Hot Teddy. 7.5, Czech Song Recital. 7.30, See Prague. 9.30 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra, conducted by Lemans: Circus March (Guillemin); Overture, Lysistrata (Lincke); Waltz, Dorfschwalben aus Oesterreich (Strauss); Serenade (Dearly and Leslie); Selection from La Mascotte (Audran); Violin Solo, Andalous (Sarasate); In the Valley of the Moon (Tobias and Burke); Selection from Bouche à Bouche

(Yvain); Two-step, Angelina (Ricardo). 1.0 p.m., Le Journal Parlé. 1.10, Gramophone Concert. 5.0, Concert of French Music by the Radio Orchestra, conducted by Walpot: French Military March (Saint-Saëns); Overture, The Black Domino (Auber); Selection from Lakmé (Delibes); Bruissement sous Bois (Razigade); Selection from Hans the Flute Player (Ganne); Ave Maria (Gounod); Divertissement from Les Erynnies (Massenet). 6.0, Talk on Folklore. 6.15, Trio Concert: Trio in G minor (Jougen); Trio in G (Haydn), Ein Heldenleben (Richard Strauss) on Gramophone Records. 7.30, Film and Theatre Review. 8.0, Concert by the Radio Orchestra, conducted by Walpot: March, The Washington Post (Souza); Overture, Les Saltimbanques (Ganne); Waltz, Cuckoo (Jonasson). 8.15, La Paix chez soi—Sketch (Georges Courteline). 8.30, Concert (contd.): In the Harbour of Port Saïd (Armandola); Selection from La Bohème (Puccini); Fantaisie Ballet (de Bériot). 9.0, L'Article 330—Sketch (Georges Courteline). 9.20, Concert (contd.): In a Persian Market (Ketelhey); Waltz, Mon rêve (Waldteufel); Rendez-vous (Laetter); Selection from Le Chemin du Paradis (Heymann); The Student passes by (Ibanez). 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—12 Noon, Gramophone Concert of Popular Music. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans: March (Heymann); Waltz, Violettes (Waldteufel); Serenade (Eynde); Millécker Potpourri (Morena); Pianoforte Solos (Mayerl): (a) Sleepy Piano, (b) Antiquary; Masquerade from The Merchant of Venice (Sullivan); Tendre sérénade (Boland); Foxtrot, I owe you (Hartman-Goodhart). 6.0, Gramophone Music: Ballet Music from The Seasons (Glazunov); Symphonic Rhapsody, With a Song in my Heart (Rodgers). 5.45, Programme for Children. 6.30, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Rosamunde (Schubert); Légende for Cello (Hullebroeck); Flemish Divertissement (Vidal); Historiette pour bébé (Dejoncker); Selection from The Jewels of the Madonna (Wolf-Ferrari); Pianoforte Solo: Rapsodie fantastique (Douliez); Serenade (Glydnark); Slav Dance No. 8 (Dvorák). 7.12, News. 7.15, Talk. 7.30, Programme by Pirreke Pirrewit. 8.0, Italian Serenade (Hugo Wolf) on Gramophone Records. 8.8, Freddy—One-Act Play (Monet). 8.42, News. 8.45, Talk. 9.0, Wagner Concert by the Augmented Station Orchestra, conducted by Menlemans: Overture, Rienzi; Prelude to Lohengrin; Good Friday Magic from Parsifal; The Ride of the Valkyries from The Valkyrie; Albnunblatt; Forest Murmurs from Siegfried; Overture, The Mastersingers. 10.0, Le Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra. March (Tanasco); Waltz (Lumbye); La scarabée d'or (Chillemont); Selection from Tosca (Puccini); Selection from Sylvia (Delibes). 5.0, Radio Journal. 5.15, Song Recital by Theodorian. 5.30, Concert (contd.). Ballet Music from The Demon (Rubinstein); Cello Solo: Aubade (Caludi); Idyll (Königsberger); Intermezzo (Jessel). 6.0, Educational Talk. 6.20, Songs on Gramophone Records. 6.40, Educational Programme. 7.0, Quartet in F (Rogalsky), by the Sarvas Quartet. 7.30, Talk. 7.45, Recital on Two Pianofortes by Maria Nitzescu Philippide and Clementine Cernetzky. Sonata in F (Mozart); Prelude in G (Maery); Prelude in E Minor (Maery). 8.15, Song Recital by Mme. Ligeo. 8.45, Radio Journal. 9.0, Light Music, relayed from a Restaurant.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 840 metres from 7.10 p.m. till Close Down.—4.30 p.m., Concert by an Orchestra of Unemployed Musicians, conducted by Bela Melles. 5.30, German Lesson. 6.0, Violin Recital by Johann Konez; La Folia (Corelli); Andantino (Padre-Martini); German Dance (Mozart); Waltz (Brahms); Tempo di Minuto (Pugnani-Kreisler); Cradle Song (Achron); Traum durch die Dämmerung (R. Strauss-Hubay); Slav Dance (Dvořák); Bolero (Sarasate). 6.35, Reading. 7.10, Karl Burian Memorial Programme. Talk and Gramophone Records. 8.0, News. 8.20, Concert by the Opera House Orchestra, conducted by Ludwig Raiter. Overture, Oberon (Weber); First Symphony in C Minor (Brahms). 9.20, Weather. 9.25, Concert by the Dező Csorba Cigány Band from the Hotel Britannia. In the interval at 10.0, Talk in French: Hungary in the eyes of the Foreign Press. 11.0 (approx.), Close Down. CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW.—Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Town Hall Chimes. 11.2 to 1.0 p.m., Concert from the Hotel d'Angleterre. 2.20, Talk for the Housewife. 2.30, Concert by the Radio Orchestra, conducted by Emil Reesen: Overture, Tancred (Rossini); Yesterthoughts (Herbert); Granada, from the Spanish Suite (Albeniz); Histoires (Herbert); Dance of the Hours from La Gioconda (Ponchielli); Overture, Zampa (Hérold); Waltz, Toujours on jamais (Waldteufel); Selection from The Three Musketeers (Friml); Saekkepie (Nielsen); Polonaise from Eugene Onegin (Tchaikovsky). In an interval at 4.15 (approx.), Reading. 4.30, Exchange and Market Prices. 4.45 Talk. 5.15, English Lesson. 5.45, Weather. 5.54, Report of the Workers' Radio Society. 6.0, News. 6.15, Time Signal. 6.30, Talk: Family Life and the Economic Crisis. 7.0, Town Hall Chimes. 7.2 to 10.15, A Discussion, relayed from the University. 9.15, News. 9.30, Concert of Contemporary Danish Music, by the Radio Orchestra, conducted by Lanny Gröndahl: Comedy Overture (Knudde Riisager). Concertino for Violin and Chamber Orchestra (Tarp); Festival Overture (Peder Gram). 10.0, Dance Music from the Lodberg Restaurant. In the interval at 11.0, Town Hall Chimes. 11.30 (approx.), Close Down.

CORK.—See Athlone.

## CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Miscellaneous Announcements. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45 till Close Down, See Warsaw. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C. 11.0 a.m., Happy Hour. Part I—Orchestral Concert. Signature Tune; The Skaters' Waltz (Waldteufel); The Butterfly (Nevin); Bandonian Solo: March, Father Rhine (Porschmann); The Nightingale in the Lilac Bush (Kromu); The Mill in the Forest (Eilenberg); March, Blaze Away (Holzmann); Serenade (Pierné); Monastery Bells (Wely). Part II—Dance Music. Since Maggie became Margaret; I can't remember (Berlin); I remember you from somewhere; There's a Cabin in the Pines (Hill); Let's all be happy together (Thomas); Meet me in the gloaming (Goodhart); With my Guitar and you; Lover (Rodgers); Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0 p.m., Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Orchestral Concert for Chiechester and Bognor: Signature Tune, The Night by the Sea; Colonel Bogy (Aldford); That dear old Song (Love); Gems of Robbie Burns (Beaton); Song: My Dream (Tosti); The Grasshopper's Dance (Bucalossi); In the Mystic Land of Egypt (Ketelhey); I pitch my lonely Caravan (Coates); The Whistler and his Dog (Pryor). 5.30, Concert for Hastings and Eastbourne: Hawaiian Band; My South Sea Home (Camillio); Lonely Little Vagabond (Seely); Three little words (Cleck); Tomi, Tomi (Traditional); Maui Girl (Libornio); Lazy Louisiana Moon (Donaldson); Kamschamola (Traditional); Reef of Stars (Watts); Signature Tune. 6.0, Programme in French. 10.0 p.m. to 2.0 a.m. (Tuesday), Programme in English by the I.B.C. 10.0 (approx.), Dance Music: Signature Tune, Bells of Normandy; You're telling me (Donaldson); Sweet dreams, pretty lady (Downey); Oh, Johanna (Lawrence); Roll up the carpet (Hoffmann); Sweetheart Darlin' (Kahn); Down in the Valley (Harrington); The Gold-Diggers' Song (Dublin); Lover (Rodgers); Someone stole Gabriel's Horn (Mills); Meet me in the gloaming (Goodhart); I'm getting sentimental over you (Baffmann); Sundown in a little Green Hollow (Whiting); Adorable (Marion); Nobody's Sweetheart (Kahn); Reflections in the Water (Webster); Let's call it a day (Brown); Signature Tune. 11.0, Tunes from the Talkies: Signature Tune, Sittin' in the Dark; Shuffle off to Buffalo (Warren); That's why Darkies were born; Moonstruck (Johnson); There's something about a soldier (Gay); Song of the West (Youmans); The Kiss Waltz (Burke); My Lucky Day (Parr Davies); Smilin' Through (Penn); Signature Tune. 11.30, Club Concert for Stoke-on-Trent Listeners. Part I—Military Band. Signature Tune, The Chum Song; March, Viscount Nelson March (Zehle); In a Persian Market (Ketelhey); Here, there, and everywhere (Bosc); Song: Temple Bells (Woodford-Finden); Ballad Memories (arr. Baynes); Song: Maire ny girl (Aitken); The Squirrel Dance (Elliot-Smith); Selection, San Toy (Monckton). 12.5 a.m. (Tuesday), I.B.C. Late News Bulletin in English. 12.10 (approx.), Club Concert Part II. I'm one of the lads of Valencia; Let me explain (Towers); Sloppy Joe (Bigard); Balloons (Magine); How can you say No (Dublin); Signature Tune. 12.30, Dance Music by Ambrose and his Orchestra (Electrical Transcriptions); I cover the Waterfront (Heymann); Maybe I love you too much (Berlin); Down the old Ox Road (Coslow); When

OCT. 9th

MONDAY

continued

Gimble hits the Cymbal (Gordon); All over Italy (Butler); Learn to Croon (Coslow); Under my Umbrella (Meyer); Good-night but not Good-bye (Roberts). 1.0, Dance Music: Signat'ne Tune, Bells of Normandy; My Lucky Day (Parr-Davies); It was a night in June (Gordon); Happy Ending (Parr-Davies); It's Sunday down in Caroline (Symes); From me to you (King); Lazybones (Mercer); Love Songs of the Nile (Freed); Isn't it Heavenly (Hamburg); A Woman should stick to her man (Hida); I raised my Hat (Steninger); At the Old Pig and Whistle (Butler); Twelfth Street Rag (Bowman); Peter, Peter (Connelly); In a second-hand store (Praise); One Tiny Tear (Connelly); Stay out of my dreams (Washington); Signat'ne Tune. 2.0, I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

## FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, 1,220 kc/s, 245.9 metres; and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35, Orchestral Concert, conducted by Sälzer; Overture, The Nuremberg Doll (Adam); Waltz, Lotusblumen (Ohlsen); Die Post kommt (Eilenberg); Selection from Romanesca (Zikov); Overture, Berlin wie es weint und lacht (Couradi); Potpourri (Wilhelm); Parade March, No. 1 (Möllerdorf). 2.30, Weather. 2.40, Time and Market Prices. 3.0, Concert. 5.0, See Stuttgart. 5.35, Talk: The Soldier-Politician Student. 5.50, Weather and News. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, Topical Talk. 7.10, Choral and Orchestral Concert from Langenberg. 9.0, Time and News. 9.20, See Stuttgart. 9.30, Time and News. 9.45, Orchestral Concert. 10.0, See Stuttgart. 11.0, Serenade from Langenberg. 12 Midnight, Close Down.

FREDRIKSSTAD.—See Oslo.

FREIBURG.—See Stuttgart.

GENEVA.—See Radio-Suisse Romande.

GENOA.—See Turin.

GLEIWITZ.—See Breslau.

GÖTEBORG.—See Stockholm.

GRAZ.—See Vienna.

HAMAR.—See Oslo.

## HAMBURG

Call ha (in Morse), 806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres, and Kiel, 1,292 kc/s, 232.2 metres.—4.30 p.m., Topical Programme. 5.0, Variety Programme. 5.40, Exchange and Market Prices. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, Political Announcements. 7.10, See Langenberg. 9.0, Time and News. 9.20 (from Kiel), Orchestral Concert, conducted by Hans Döring; Overture, Il Scraglio (Mozart); Selection from The Barber of Seville (Rossini); Tone Picture, Der Tag von Potsdam (Schmalstich); Veil Intermezzo from Mona Lisa (Max von Schilling); Potpourri. So singt man am Rhein (Haseloff); Air and Dance of the Apprentices from The Mastersingers (Wagner); Zeller Waltz Potpourri (Tijele); Plote Positionelle (Rathke); Gipsy Idyll (Wolff-Ferrari); Andalusian Serenade (Eilenberg); Waltz, Schwert und Leier (Strauss); March, Fürs liebe Vaterland (Blankenburg).

HANOVER.—See Hamburg.

## HEILSBURG

1,885 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 to 1.30 p.m., Gramophone Concert: Overture, Alessandro Stradella (Flotow); Aria from Alessandro Stradella (Flotow); Overture, Undine (Lortzing); Bass Solos from Undine (Lortzing); (a) Es wohnt am Seestade, (b) Im Wein ist Wahrheit; Melody; Selection from Der Waffenschmied (Lortzing); Overture, Der Schauspieldirektor (Mozart); March, Song and Air from The Golden Cross (Brüll); Overture, Der Wildschütz (Lortzing); Selection from Der Wildschütz (Lortzing). In the intervals at 12 Noon, Time and Weather, and at 12.20 and 1.0, News. 2.5, Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Lestoeq (Auber); Rhapsody (Elukhen); Suite, Carnival (Schmalstich); Waltz, Lustiges Wien (Meisel); Der Wolgazeuner (Spialek); Moonlight in Venice (Brase); Italian Barcarolle (Czibulka); Selection from Zigeunerprimas (Kálmán); Overture, Prinz und Maurer (Oehlsch). In the interval at 3.0, Book Review. 4.0, Talk: In a Collapsible Boat in Northern Seas. 4.25, Songs and Flute Music. 5.15, Market Prices. 5.25 (from Danzig), Talk: Danzig and its Literature in the Baroque Period. 5.50, Weather. 6.0, Transmission for all German Stations: When the Cock crows—Comedy (August Hinrichs). 7.0, Weather and News. 7.10, Concert of Light Music by the Station Orchestra, conducted by Eugen Wilcken. 8.30, Part Relay of the Bach Concert from Langenberg. 9.15 (approx.), Weather and News.

## HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to 5.40 p.m., and 20 kW from 5.40 p.m. Programme

by the Algemeene Vereeniging Radio Omroep (A.V.R.O.).—11.40 a.m., Time Signal. 11.41, Concert by the Station Orchestra, conducted by Nico Treep: March, Mit Standarten (Blon); Overture, Le puits d'amour (Balfe); Cradle Song (Fucik); La Serenata (Braga); Ballet Suite (Poppy); Gramophone Records: Selection from Cavalleria Rusticana (Mascagni); Melody (Siede); Japanese Polka (Berger); Waltz, Brune ou Blonde (Waldteufel); Gramophone Records: Selection from The Czarevitch (Lehár); Air (Noack); Japanese Bell Dance (Yoshitomo); Gallop, Durchs Ziel (Translatour). 1.55, Interval. 2.10, Gramophone Music. 3.40, Song Recital by Herta Glieckman. 4.10, Talk, with Gramophone Illustrations: The Organ and Organ Music. 5.10, Concert of Light Music by the Octophonikers. 6.10, Gramophone Music. 6.40, Musical Interpretation—A Lecture Recital by Annie Lambrechts (Soprano) and José Rodriguez Lopez (Pianoforte): Aria from Xerxes (Handel); Aria from Elijah (Mendelssohn); Pianoforte Solo: Impromptu in A Flat (Chopin); Song: Im Kahne (Grieg); 7.10, Talk. 7.40, Time and News. 7.45, Concert of Light Music by the Octophonikers. 8.55, Gramophone Music. 9.10, Christopher Columbus—Play (van Mowkerken). 9.40, Concert by the Station Orchestra, conducted by Nico Treep. Soloist: Rie Beute (Pianoforte); Overture, Athalie (Mendelssohn); Pianoforte Concerto in A minor, Op. 54 (Schumann). 10.40, News. 10.50, Gramophone Music. 11.40, National Anthem, Time and Close Down.

HORBY.—See Stockholm.

## HUIZEN

160 kc/s, 1,875 metres; 7 kW. (until 3.40 p.m.). Transmitted from Kootwijk on 5.0 kW. from 3.40 p.m. Programme of the Christian Radio Society (N.C.R.V.).—11.55 a.m., Gramophone Music. 12.10 p.m., Organ Recital by Jan Zwart: Three Pieces (Salomé); (a) March, (b) Eclogue, (c) Symphonic Minuet; Preludes and Chorals (Zwart); Three Pieces (Hollins); (a) Grand Choral, (b) Spring Song, (c) Trumpet Minuet; Preludes and Chorals (Zwart); Pieces (César Franck): (a) Andantino, (b) Pièce héroïque, (c) Cantabile; Preludes and Chorals (Zwart). 1.40, Broadcast for Schools. 2.15, Gramophone Music. 2.25, Talk for Housewives. 2.55, Dressmaking Lesson. 3.25 to 3.40, Interval. 3.40, Bible Reading and Sacred Music. 4.40, Gramophone Music. 4.55, Recital by Johannes de Heer (Songs) and Verver (Violin). 5.55, Gramophone Music. 6.10, Answers to Correspondence. 6.40, Police Notes. 6.55, Religious News. 7.10, Answers to Correspondence (contd.). 7.40, Concert by the Monnikendam Women's Choir, conducted by Siemer. In the intervals, Gramophone Music. 8.40, Talk. 9.10, Violin, Viola and Pianoforte Recital by Nolthenius (Pianoforte), Helden (Violin), and Joh. Helden (Violin and Viola): Trio No. 7 in E Flat (Mozart); Sonata for Two Violins (Honegger); Sonata No. 8 in D (Leclair). In the interval at 9.35 (approx.), News. 10.10, Gramophone Music. 11.10 (approx.), Close Down.

INNSBRUCK.—See Vienna.

KALUNDBORG.—See Copenhagen.

KIEL.—See Hamburg.

KLAGENFURT.—See Vienna.

KOSICE.—See Prague.

## LANGENBERG

635 kc/s, 473 metres; 60 kW.—12.35 p.m., Concert from Frankfurt. 1.35, Meat Market Prices. 2.0, Pictures of Kaiserswerth—Talks: (a) Twelve Hundred Years of German Culture and History, (b) The Centenary Festival of the Kaiserswerth Deaconesses (Protestant Sisters of Charity). 2.30, Exchange. 2.50, Political Announcements. 3.0, Concert from Frankfurt. 5.0, French Lesson from Stuttgart. 5.20, See Stuttgart. 5.35, Talk: Marxism and Superstition. 5.50, News. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, See Frankfurt. 7.10, Twentieth German Bach Festival—Choral and Orchestral Concert, relayed from the Gürzenich, Cologne; The Municipal Orchestra and the Concert Society Choir, conducted by Prof. Hermann Abendroth, with Soloists: Cantata No. 119, Preise, Jerusalem, den Herrn—for Solo Voices, Choir and Orchestra; Concerto in C for three Pianofortes and String Orchestra; The Braudenburg Concerto No. 3 in G; Der zufriedengestellte Aeolus—for Soloists, Choir and Orchestra. 9.0, See Frankfurt. 9.20, Talk from Stuttgart. 9.30, General News. 9.40 to 11.0, See Stuttgart. 11.0, Robert Schumann Concert, on Gramophone Records: Manfred Overture, Op. 115; Two Songs for Baritone: (a) Die Lotoslume, (b) Ich grolle nicht; Second Symphony in C, Op. 61. 12 Midnight (approx.), Close Down.

LAUSANNE.—See Radio-Suisse Romande.

## LEIPZIG

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—1.45 p.m.,

Spanish Dances on Gramophone Records: Three Dances (Sarasate): (a) Malagueña, (b) Habanera, (c) Jota Navarra; Spanish Dance No. 5 (Granados); Bolero (Ravel). 2.35, Exchange and Market Prices. 3.0, Famous German Books: Reading from Magelone. 3.30, Concert from Frankfurt. 4.50, Exchange, Weather, and Time. 5.0, Italian Lesson. 5.30, Schubert Songs and Dances—Recital by Willy Zilken (Tenor) and Theodor Blumer (Pianoforte): Sentimentale Walzer, Op. 50; Songs, with Pianoforte Accompaniment: (a) Der Entferten, (b) An den Mond, (c) Lebensmut; Letzte Walzer. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, Military Band Concert, relayed from Erfurt. 8.0, Humorous Programme. 8.30, Part Relay of Bach Festival Concert, from Langenberg. 9.0, News. 9.20 (approx.), Programme to be announced. 10.0, Concert of Light Music by the Emde Orchestra: Selection from Eva (Lehár); Intermezzo, Es war mal ein Zigeuner (Elneg); Finale from Lucia di Lammermoor (Donizetti); Liebesserenade (Waldau); Potpourri, Auf Wiederhören (Weinger); Schlosswache der Ameisen (Rathke); Song, Gute Nacht, du mein herziges Kind (Abt); March, Wiener-Jungarheiter (Stepani). 11.0 (approx.), Close Down.

LINZ.—See Vienna.

## LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Gramophone Music. 6.30, Programme for Listeners Abroad. 7.0, Gramophone Music. 7.30, Concert by the Station Orchestra. 8.30, Weather and News. 9.0, Light Music by the Station Orchestra. 10.0 (approx.), Close Down.

## LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—Polish Evening. 7.30 p.m., Gramophone Concert of Variety Music. 8.5, Talk on Chopin. 8.20, Song Recital by Josepha Eiltzinger. 8.50, News in French. 9.0, Polish Concert by the Station Orchestra, conducted by Henri Pénis. Soloist: Félicia Blumenthal (Pianoforte). Concerto (Fitelberg); Pianoforte Concerto in E minor (Chopin). 9.45, News in German. 9.55, Concert by the Station Orchestra, conducted by Henri Pénis: Ballet égyptien (Luigini); Brin de Muguet (Doulez); Overture, William Tell (Rossini). 10.25, Dance Music on Gramophone Records.

## LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.30 p.m., Radio Gazette for Lyons and the South-East. 8.30, Popular Concert.

## MADRID

ARANJUEZ (EAQ), 9,860 kc/s, 30.43 metres; 20 kW.—10.30 p.m., Light Music. In the interval at 10.45, Radio Chronique. 11.35, Sports Notes. 11.40, Light Music. 12 Midnight till Close Down, Programme in English by the I.B.C. 12 Midnight, Concert: Song of the Vagabonds; Montana Call; Speak Easy; Selection from The Flower of Hawaii; The Blue Danube; Hot Feet; Selection from Congress Dances; Black Eyes. 12.30 a.m. (Tuesday), I.B.C. Good-night Melody and Close Down.

MALMO.—See Stockholm.

MILAN.—See Turin.

## MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Plichta. 3.50, See Prague. 4.5, Gramophone Music. 4.15, See Prague. 4.25, Gramophone Music. 4.35, See Prague. 4.50, Gramophone Music. 5.5, Talk: Normal and Abnormal Children. 5.15, See Prague. 5.30, German Transmission: Sketch (Mannhous). 6.0, See Prague. 6.10, See Brno. 6.25, Concert of Light Music. 7.30, See Prague. 9.15 (approx.), Close Down.

## MOSCOW

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—11.45 a.m., Weather. 1.45 p.m., Weather. 2.0, Music about Stenka Razin—Concert. 3.0, German Lesson. 3.30, Literary Programme. 4.30, Talk: Air. 5.30, Concert relayed from the Radio Theatre: Spring Quartet (Debussy); Five Songs; Pianoforte Pieces (Ravel). 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

MOTALA.—See Stockholm.

MUHLACKER.—See Stuttgart.

## MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.5 p.m., Autumn in the Palatinate—Literary and Musical Programme relayed

from Begzaberu: Part I, Talk: Country and People in the Wasgau in Autumn; Part II: Autumn in the Palatinate Forest—Variety Programme. 4.45, Programme for Young People. 5.5, The Music of Gottlieb Feurburg—Vocal and Instrumental Concert. 5.25, Talk: Modern Iceland. 5.45, Time, Weather and Agricultural Notes. 6.0, Transmission for all German Stations relayed from Heilsberg. 7.0, Concert by the Small Station Orchestra, conducted by Erich Kloss: Soloist: Martha Martensen (Soprano). 8.0, The Smith of Schöffing—Folk Play (Gerstorfer). 9.0, Austria. 9.20, Time, Weather and News. 10.0, Serenade from Leipzig. 11.0, Close Down.

NAPLES.—See Rome.

NOTODDEN.—See Oslo.

## OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 463.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Concert by the Radio Ensemble: March, Matafori (Siede); Amoretentänze (Gungl); Overture, Raymond (Thomas); Mein süßer Ivan (Kálmán); Selection from Die Puppenfee (Bayer); Aria from La Wally (Catalani); Serenata capricciosa (Ranzato); Slav Dance No. 1 (Dvořák). 5.0, German Lesson. 5.30, Concert by the Jolly Accordion Quartet. 6.0, Announcements, Weather and News. 6.30, Talk, relayed from Bergen, 824 kc/s, 364 metres. 7.0, Time Signal. 7.2, Political Review. 7.30, Pianoforte recital of Norwegian Music by Frithjof Backer Grøndahl. 8.0, Talk by the Socialist Leader, Mowinckel: Before the Elections. 8.20, Norwegian Song Recital by Dagny Schjelderup. 8.40, News. 9.0, Topical Talk. 9.15, Sven Elvestad reads from his own Works. 9.45 (approx.), Close Down.

OSTERSUND.—See Stockholm.

## PALERMO

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolaro Announcements, Tourist Talk. Agricultural Report, Report of the Royal Geographical Society and Giornale Radio. 7.30, Gramophone Music. In the interval at 7.20, Announcements. 7.45, Chamber Music. Nicastro (Pianoforte), Aida Gonzaga (Soprano), and Lojaco (Violin). Pianoforte Solo, Sonata Eroica (MacDowell); Soprano Solos: (a) Canti della sera (Santoliquldo), (b) No e si (Chik); Violin Solos: (a) un poco triste (Stugi), (b) Prelude and Rondo (Mortari); Soprano Solos: (a) Stelle d'oro (Denza), (b) Aria from Fra Diavolo (Auber); Violin Solos: (a) Caprice (Kreisler), (b) Aria (Porpora-Corti), (c) Piedmontese Rhapsody (Sinigaglia); Pianoforte Solos: (a) Orientale (Albéniz), (b) Fantastic Dance (Turina). After the Concert, Light Music 10.0, Giornale Radio.

## PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Richard Strauss Music on Gramophone Records: Selection from Der Rosenkavalier; Dance of the Seven Veils from Salome. 7.15, Le Journal Parlé. 7.30, Gramophone Music. 8.0, Talk on Cars. 8.5, Gramophone Music. 8.20, Song Recital. 9.15, Gramophone Concert. 10.30, News.

## PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m., Weather and Physical Culture. 7.45, Gramophone Records: Marionnettes (Glazunov); Serenade (Micheli); Backfischerin (Ziehrer); Palikoko Blues. 8.0, Weather and Press Review. 12.0 Noon, Gramophone Concert of Modern Songs and Ballet Music: Three Airs from Le Couronnement de la Muse du Peuple (Charpentier); Four Songs and Ballet Music from Marouf (Rabaud); Scene from Pelléas et Mélisande (Debussy); Introduction to Act I of Fervaal (d'Indy); Two Airs from L'Heure espagnole (Ravel); Dance and Song from Penelope (Fauré); Variations on a Popular Theme from La Ronde des saisons (Busser); Adieux à la Forêt, from l'Attaque du Moulin (Bruneau); Selection from Love for the Three Oranges (Prokofiev). In the intervals at 1.0 p.m., Exchange, News, and Weather; at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.50, Film Review. 7.0, Book Review. 7.20, Gramophone Music: Quadrille from La Mascotte (Audran); Mignonne Amie (Pijan); Villanelle (Dell'Aqua); La Mousmée (Ganne); Tout Petit (Hartush); Puck's Minuet (Howells). 7.45, News and Horticultural Talk. 8.0, Miss Decima—Opera (Audran). In the intervals at 8.30, News and Weather. At 8.40, Review by Reboux; and at 9.15, Press Review and News.

## PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W3XK on 48.86 metres and 25.27 metres.—8.0 p.m., Programme to be announced. 8.15, Words and Music, from New York. 8.30, Popular Programme. 8.35, Pat Haley. 8.45, Human Values. 9.0, Bob and Betty, from New York. 9.15, Radio Guild, from New York. 10.15, KDKA Kiddies' Klub,

OCT. 9th **MONDAY** continued

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.  
**TRONDHEIM**.—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Gramophone Music, 5.0 to 5.5, Weather, 5.40, Giornale Radio, Dopolaro Announcements, and Gramophone Music, 6.0, Time, Tourist Talk and Gramophone Music, 6.10, Agricultural Notes and Market Report, 6.20, News in Foreign Languages, 6.40, Gramophone Music, 7.0, Announcements, Giornale Radio, and Weather, 7.15, Sponsored Concert, 8.15, A Comedy in One Act, 8.45, Concert of Chamber Music; Soloists, Marisa Merlo (Soprano) and Rina Galanti (Harp), 9.20, Orchestral Concert, conducted by Tito Petralia; Con me ti porterò (Profes-Ramo); Piece (Reyev); Intermezzo from Danzatrice (Petrasini); Selection from Suor Angelica (Puccini-Tavani); Piece (Spoliansky); Quando mi baci, 10.0, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning), and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—11.0 to 11.15 a.m., Religious Information in Italian, 8.0 to 8.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 213.5 metres.—11.0 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer. Soubrette-marsch (Rochlitzer); Overture, Die Diva (Weinberger); Song, Ein Märchen, vom Herrgott Erldacht (Gangelberger); Selection from The Czarevitch (Lehár); Lock-Polka (Strauss); Precieuse (Gillet); The Sultan's Dream (Stolz); Song, Schubert (Fohringer); Waltz, Ich laeh (Ziehrer); Potpourri, The Tyrol in Song and Dance (Erl); Waltz, Freut euch des Lebens (Strauss); Mein Lied (Gumbert); Intermezzo, Tituba (Neumann); Slow Waltz, Verklungene Liebe (R. Glück); Caprice, The Dance of the Wood Elves (Stix); Potpourri, Wiener Raketen (Mühlbacher). In the interval at 12 Noon, Time, Weather and Announcements, 1.0 p.m., Interval, 2.0, Time Weather and Exchange, 2.20, Talk: The Art of Gliding, 2.30, Programme for Children, 2.55, Symphony No. 4 (Tchaikovsky), by the Amsterdam Concertgebouw Orchestra, conducted by Mengelberg (on Gramophone Records), 3.35, Programme for Young People, 4.0, Talk: Schubert's Settings of Lyrics, 4.25, Song and Pianoforte Recital by Hilda Franz and Gisela Wagner-Beck; Aria from The Messiah (Handel); Aria from St. Paul (Mendelssohn); Three Songs (Brahms); (a) Von waldbekrönter Höhe, (b) Auf dem See, (c) Der Schmied; Pianoforte Solos: (a) Rondo in E Flat (Hummel), (b) Thirty-two Variations (Beethoven), 5.5, Theatre Review, 5.25, Books and Works of Reference in connection with the Week's Talks, 5.30, English Lesson, 6.0, Topical Talk, 6.15, Time, Weather and Announcements, 6.25, Schubert Pianoforte Recital by Stella Wang; Fantasia, The Wanderer; Impromptu in B Flat, Op. 142, 7.0, The Lady of the Rainbow—Operetta in Three Acts (Gilbert), relayed from the Theater an der Wien. In the interval at 8.45 (approx.), News, Weather and Announcements, 10.0, Serenade on Gramophone Records. After the Programme, Announcements.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow, 11.5, Gramophone Music, 11.30, Radio Journal, 11.35, Symphony No. 4 (Schumann) on Gramophone Records, 12 Noon, Interval, 2.30 p.m., Economic Notes, 2.40, Traffic Report, 2.45, Aviation Report and Anti-Gas Drill, 2.55, Concert by the Post Office Mandoline Club; Spanish Overture (Viehe); Aria from The Pearl Fishers (Bizet); Melody (Capitani); Serenade (Abt); A travers les vagues (Rosches); Intermezzo, Butterfly (Borquos); March (Viehe), 3.40, Elementary French Lesson, 3.55, Light Music by the Orchestra of the Bohemian Theatre, with Songs and Recitations, 4.50, Answers to Agricultural Correspondence, 5.0, Talk: Poland To-day, 5.20, Grieg Violin and Pianoforte Sonatas played by Oziminski and Rabczewicz; Sonata in F; Sonata in C minor, 6.5, Miscellaneous Items, 6.25, Talk: Beethoven, Chopin and Henriette Sonntag, 6.40, Programme Announcements, 6.45, Radio Journal, 8.0, Herbstmanöver—Operetta in Three Acts (Kálmán). In the interval, Topical Talk, 9.0, Sports Talk, 9.10, Dance Music, In the interval at 10.0, Weather.

**WILNO**

533 kc/s, 563 metres; 16 kW.—6.20 p.m., Miscellaneous Announcements, 6.25, See Warsaw, 6.40, Programme Announcements, 6.45 till Close Down, See Warsaw.

**ZURICH**.—See Schweizerischer Landessender.

gramme, 2.0, A. and P. Gipsies, 2.30, Popular Programme, 3.0, Contented Programme, 3.30, Musical Programme.

**SCHWEIZERISCHER**

**LANDESSENDER**

**BEROMUNSTER**, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,200 kc/s, 245.9 metres.—5.50 a.m. to 6.5 (from Berne), Gymnastics, 10.59, Time Signal from Neuchâtel Observatory, 11.0 (from Basle), Ländler and Yodels on Gramophone Records, 11.30, Time, Weather and News, 11.40 (from Basle), Gramophone Records, 12.25 p.m. (from Basle), Time, Weather and Exchange, 1.30 (approx.), to 4.0, Interval, 4.0 (from Berne), Talk for Women, 4.30 (from Berne), Gramophone Music, 5.30 (from Zürich), Talk: Swiss Statesmen in Time of Crisis, 6.0, Time and Weather, 6.5 (from Zürich), Gramophone Music, 6.30 (from Zürich), Elementary English Lesson, 7.0 (from Zürich), Othmar Schöckel Lieder Recital, 7.30 (from Zürich), Programme to be announced, 8.0, Weather and News, 8.10 (from Zürich), Concert of French Music by the Station Orchestra, 9.15 (approx.), Close Down.

**SOTTENS**.—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—12 Noon to 12.30 p.m., Broadcast for Schools, 4.5 (from Boden), Country Airs, 4.25, Reading, 4.45, Gramophone Music, 5.45, Elementary German Lesson, 6.15, Weather and News, 6.30, Talk on Heredity, 7.0 (from Göteborg), Violin and Song Recital by Lars Fermæus and Marianne Lagerholm, 7.45, Talk:

Sextet (Thuille); Pianoforte Solo: Petite Suite (D'Olone); Caprice on Danish and Russian Airs (Saint-Saëns), 7.30, Time and News, 7.45, Gramophone Music, 8.0, Press Review in German, Lottery Results and Announcements, 8.30, Concert, Part I—Chamber Music, Octet for Strings (Mendelssohn), Part II—Orchestral Music, conducted by Roskam, One-Step; Elle était au Nord (Calabrese); Hydropathen-Walzer (Gungl); Violin and Orchestra: Canzonetta (d'Ambrosio); Foxtrot, Gold River (Allouche); Tango (Moretti); The Kiss Serenade (Micheli); Selection from The Maid from the Black Forest (Jessel); Foxtrot, Gib's im Radio Tanzmusik? (Kolle); Whistling Waltz (Reaves-Evans); Foxtrot, You try Somebody Else; March, A petits pas (Sudesi); Foxtrot, Hello (Fraggi); Two-Step, Solera (Demon). In an interval at 9.30 (approx.), Press Review, 10.30 (approx.), Close Down.

**STUTTGART**

**MUHLACKER**, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.35 p.m., See Frankfurt, 1.30 to 2.30, Interval, 2.30, Provincial Programme—The Swabian Alps, 3.0, See Frankfurt, 5.0, French Lesson, 5.20, Talk: The First European to cross South Arabia, 5.35 (from Mannheim), Talk: Reckoning, 5.50, Time and Market Prices, 6.0, Transmission for all German Stations, relayed from Heilsberg, 7.0, See Frankfurt, 7.10, See Langenberg, 9.0, See Munich, 9.20, Talk: You must know, . . . 9.30, Time and News, 9.45, Local News, 10.0, Variety Programme, 11.0, See Langenberg, 12 Midnight (approx.), Close Down.

**SUNDSVALL**.—See Stockholm.

**TOULOUSE**

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News, 6.15, Orchestral Music, 6.30, Arias from Opera, 6.45, Overture, Fingal's Cave (Mendelssohn), 7.0, Chansonnettes, 7.15, News,



The complete musical staff of the new Hamburg station. In the right foreground are the four permanent soloists and behind them the regular orchestra of the Norddeutsche Rundfunk. In the background is the Nordfunk Dance Orchestra and the station choir.

Travel Experiences, 8.15, Cabaret Programme, 8.45, Weather and News, 9.0, Vocal and Instrumental Concert, relayed from Malmö, 1,301 kc/s, 231 metres; Axel Boberg (Organ), Ragnar Blennow (Songs), and Guido Vecchi (Cello), Organ Solo; Aria Pastorale (Fraeuck), Songs: (a) Aria from Samson (Handel), (b) Halleluja (Hummel), Cello and Organ: Largo and Allegro from the Sonata in F (Marcellini), Organ Solo: Benedictus (Reger), Two Hymns, Cello and Organ: (a) Adagio (Locatelli), (b) Pastorale (Boccherini), Organ Solo: Prelude and Passacaglia (Marteau), 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Classical Music on Gramophone Records, 12.45 p.m., News, 1.0, Time and Exchange, 1.5, Variety Music on Gramophone Records, 2.0, Interval, 5.0, Orchestral Concert, conducted by Roskam; March, El Capitau (Sonsa); Selection from La Traviata (Verdi); Sérénade à Graziella (Desprez); Waltz, Transaktionen (Joh. Strauss); Cello Solo: Berceuse (Dunkler); Mysterious Dance (Bühlow); Selection from The Girl in the Taxi (Gilbert), 6.0, Film Review, 6.15, Review of the Week in German, 6.30, Wind Instrument Concert, Pianoforte and Wind Instruments.

Racing Results and Market Prices, 7.30, Accordion Music, 7.45, Viennese Music: Selection from The Count of Luxembourg (Lehár); Gold and Silver (Lehár); Wiener Blut (Strauss); Strauss Potpourri (Suppé), 8.0, Sound Film Music, 8.15, Orchestral Concert: Marche héroïque (Saint-Saëns); In the Steppes of Central Asia (Borodin); Prélude à l'après-midi d'un Faune (Debussy); A Hunt in the Black Forest (Volcker); Overture, Light Cavalry (Suppé), 8.45, Extracts from The Valkyrie—Opera (Wagner), 9.15, Airs from Operetta, 9.30, Accordion Music, 10.0, Military Music, 10.15, North African News, 10.30, Concert for Listeners in Morocco; Ginger (Brunest); Divine Aida, from Aida (Verdi); Wine, Woman, and Song (Strauss); Melody (Zaka); Overture, Fizaro (Lozovt); Butterfly (Bendix); Si me vers vient des Ailes (Lahn); Maria Mari, 11.0, Request Music, 11.15, Dance Music, 12.0 Midnight, News, Weather, and Announcements, 12.5 a.m. (Tuesday), Opera Music: Airs from Manon (Massenet), Le Jongleur de Notre Dame (Massenet), Le Roi d'Ys (Lalo), and La Dame blanche (Boieldieu), 12.15 a.m., Orchestral Music: Un peu d'amour (Silés); En sens unique (Stellio); American Tango (Mimewitch); Sidi bel Abbas (Pasquali), 12.30 (approx.), Close Down.

10.30, The Singing Lady, from New York, 10.45, Orphan Annie, from New York, 11.0, Press News Reeler, 11.15, Sports: A Song, 11.30, Pittsburgh Spotlights, 11.45, Lowell Thomas, from New York, 12 Midnight, Amos 'n' Andy, from New York, 12.15 a.m. (Tuesday), Baby Rose Marie, from New York, 12.30, Popular Programme, 1.0, The Nottads, from New York, 1.30, Potash and Perlmutter, 1.45, Red Davis, from New York, 2.0, Sinclair Minstrels, from New York, 2.30, Melody Moments, from New York, 3.0, Silver-toppers.

**PORSGRUND**.—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Moravská-Ostrava, 3.50, Programme for Children, 4.5, Gramophone Music, 4.15, Educational Talk, 4.25, Gramophone Music, 4.35, English Lesson, 5.5, Agricultural Talk, 5.15, Talk for Workers, 5.25, News in German, 5.30, German Transmission: Talk on Franz Metzner, the Sculptor, 6.0, Time and News, 6.10, See Brno, 6.25, Military Band Concert, 7.5, See Brno, 7.30, Radio Sequence (Waltner), with Music by the Station Orchestra, 9.0, Time and News, 9.15, Talk in German: Minors in Czechoslovakia, 9.30 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**SOTTENS**, 743 kc/s, 403 metres; 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics, 11.28, Time Signal from Neuchâtel Observatory, 11.30, News and Weather, 11.40 (from Lausanne), Gramophone Concert of Sound Film Music, 12 Noon (from Lausanne), Financial News, 12.10 p.m. (from Lausanne), Gramophone Concert, Part I—Popular Orchestral Pieces; Part II—Opera Music: Part III—Violin Solos, 1.0 to 2.28, Interval, 2.28, Time Signal from Neuchâtel Observatory, 2.30 (from Lausanne), Concert by the Small Radio-Lausanne Orchestra, conducted by Moser, 4.0 (from Lausanne), Programme for Children, 4.30 to 6.0, Interval, 6.0 (from Lausanne), Talk on the Lausanne Musical Festival, 6.25 (from Lausanne), News, Announcements and Weather, 6.30 (from Lausanne), Talk: Criminology in the time of Lombroso and To-day, 7.0 (from Geneva), Commemorative Talk, 7.20 (from Geneva), Pianoforte Duets by Mme. Orloff and Marcel Millioud; Sonata in A GJ. (Cherubini) Bach; Fantasia in F (Mozart); Fugue in E (Schubert); Anies d'enfants (Cras); Two Pieces in Popular Ukrainian Style (Akinenko); Five Easy Pieces (Stravinsky), 7.50 (from Lausanne), Readings, 8.15 (from Lausanne), Concert of Slav Music, 8.50, News and Weather, 9.0 (from Geneva), Talk: The Work of the League of Nations, 9.30 (approx.), Close Down.

**REYKJAVIK**

250 kc/s, 1,200 metres; 21 kW.—8.5 p.m., Musical Programme, 8.30, Weather, 8.40, Musical Programme and Announcements, 9.0, Chimes and News, 9.30, Reading, 10.0, Popular Concert by the Station Quartet, with Songs.

**RJUKAN**.—See Oslo.

**ROME**

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres; and 2RO, 11,810 kc/s, 25.4 metres.—12 Noon, Gramophone Records of Operatic and Variety Music, In the interval from 12.30 to 12.45 p.m., Giornale Radio and Exchange, 1.0, Time and Announcements, 3.30, Children's Radio Review, 3.55, Giornale Radio and Exchange, 4.10, Weather, 4.15, Vocal and Instrumental Concert, Walter Sommer (Cello), Rina Andrimini (Soprano), and Guglielmo Castello (Baritone), Cello Solos: (a) Tocata (Frescobaldi-Cassadd), (b) Ballet (Rossini-Albini); Soprano Solos: (a) Aria from William Tell (Rossini), (b) Romance from Marcella (Giordano), (c) Air from Madame Butterfly (Puccini); Baritone Solos: (a) Ballata (Mascagni), (b) Aria from Tioffand (d'Albert), (c) Aria from Nero (Rubinstein); Cello Solos: (a) Chanson villageoise (Popper), (b) Tzigane (Gabriel-Marie), 5.40 (Naples), Shipping and Sports Notes, 5.45, Dopolaro Announcements and Tourist Report, 6.10, Grain Market Report, 6.20, News in Foreign Languages, 6.40, Giornale Radio, 7.0, Time and Announcements, 7.5, Gramophone Music, 7.30, Giornale Radio and Sports Notes, 7.45, Dramatic Programme, Last Scene from the First Act of La Gioconda (Ponchielli); First Scene from the Second Act of La Figlia di Jorio (d'Annunzio), 8.15 (approx.), Concert of Light Music and Variety Music, Talks in the interval, 10.0, Giornale Radio.

**SALZBURG**.—See Vienna.

**SCHENECTADY**

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres, 7.30 p.m., Revolving Stage, from New York, 8.0, Health Hunters, 8.15 to 8.30 (approx.), Soloist, 12.45 a.m. (Tuesday), Stock Reports, 1.0 till Close Down, New York Relay, 1.0, Seacotland Sketches, 1.30, Popular Pro-

## ALGIERS

824 kc/s, 354 metres; 13 kW.—7.20 p.m., Songs from Operetta. 7.40, Lottery Results. 7.55, News. 8.0, Time Signal. 8.2, Sonata No. 1 for Pianoforte and Violin (Beethoven). 8.25, Jean Marie—Play in One Act in Verse (Theuriet). 8.55, News. 9.0, Concert of Eastern Music. 9.55, News.

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.20 to 2.30 p.m., Time Signal, Weather Report, Stock Report and Gramophone Music. 6.0, Programme for Children. 6.40, News. 7.0, Gaelic Reading. 7.15, Talk. 7.30, Time. 7.31, Irish Music by the Station Orchestra. 7.50, Contralto Solos by Mrs. Hughes. 8.5, Pipe Solos by Leo Rowsome. 8.20, A Drama by The Mimmers. 9.0, The Station Orchestra. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Concert: Me and Mr. Sunshine (Gilbert); Balloons (Shawn); The Night is gone (Castello); Maybe I love you too much (Berlin). 9.45, Dance Music: Butterflies in the Rain; There's Something about a Soldier; Wireless World Announcement; Play Fiddle, Play (Lawrence); Hustlin' and Bustlin' for Baby (Woods). 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd. on behalf of Hospitals Trust, Ltd.: Waltz, The Blue Danube (Joh. Strauss); You are my Heart's Delight (Lehár); Glowing Embers (Marsden); Cuckoo Waltz (Jonasson); Racing Commentary; Selection from Cavalleria rusticana (Mascagni); Patiently Smiling (Lehár); The Toy-maker's Dream (Golden). 10.30, I.B.C. Goodnight Melody, followed by News and Weather. 10.40, Violin and Spanish Guitar Recital. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1; 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Selection from Tosca (Puccini); Reverie (Debussy); Waltz (O. Strauss); Intermezzo (Staffelli); Largo from the Quartet No. 12 (Haydn); Pavane (d'Ambrosio); Selection from The Prophet (Meyerbeer). 7.0, Request Gramophone Music. 7.30, Exchange, and Talk in Catalan. 8.0, Gramophone Music. 8.15, Football Results, Gramophone Music, and News. 9.0, Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices. 9.5, Sponsored Programme. 9.30, Katinska—Musical Comedy in Two Acts (Sorozábal). In the interval at 11.0, News. 12 Midnight (approx.), Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—12 Noon to 3.30 p.m., See Rome. 3.30, Quintet Concert: Overture to an Operetta (Lincke); Solennità della notte (Lattuada); Pikantier (Lehár); Selection from Marmitta (Allegro). 3.55 to 5.35, See Rome. 5.35, News in Albanian. 5.45 (approx.) till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—5.55 p.m., Time and Programme Announcements. 6.0, Talk. 6.30, Trio (Beethoven). 7.0, Song Recital by Krsta Ivic. Arias from La Gioconda (Ponchielli); Andrea Chénier (Giordano); and Turandot (Puccini); La danza (Rossini); Aria from The Mastersingers (Wagner). 7.30, Radio Play. 8.15, Concert by the Station Orchestra. In the interval at 9.0, Time and News. 9.40, Dance Music, relayed from the Ratnicki Dom Restaurant.

## BERLIN

DEUTSCHLANDSENDER (REICHSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—1.0 p.m., Music by Foreign Composers—Gramophone Concert: Prelude to Carmen (Bizet); Tango (Albeniz); Fantasia on a Theme of Verdi; Minuet from the Sonata (Ravel); Melody (Smetana); Spanish Song, The Farewell (Alvarez); A Festival in Seville (Albeniz); Intrada Adagio (Desplantes); Minstrels (Debussy); Hymn to the Sun (Rimsky-Korsakov); Spanish Dance (Falla); Caucasian March (Ippolitov-Ivanov); Oriental March (Glazunov). 2.0, Concert of Light Music by the Willi Gensler Orchestra: Overture, Gri-Gri (Lincke); Lyric Suite (d'Albert); Selection from The Bird Fancier (Zeller); Humoresque (Dvorak); Jalousie (Gade); Second Rhapsody (Brahms); Minuet from the Divertissement in D (Mozart); Rusticanelle (Cortopassi); Serenade (Heykens); Valse romantique (Heinecke). 3.0, Reading (Karl Wagner). 3.15, Concert from Langenberg. 4.0, Women at Work—Radio Report from a Chocolate Factory. 4.20, Concert by the Ribert Gaden Band and Heinz Zelten (Songs). 5.0, Poems. 5.5, Talk: Preparations for the Olympic Games of 1936. 5.25, Political Press Review. 5.45, Weather and Announcements. 6.0, Transmission for all German Stations relayed from Stuttgart. 7.0, Talk. 7.10, Laughing Autumn—Variety Programme. 8.0, Concert of Contemporary Music by the Station Orchestra, conducted by Edwin Lindner: Variations on an Original Theme (Gerhard Frommel); Sinfonietta (Heinz Schubert). 9.0, News. 9.45, Weather. 10.0, Programme from Breslau. 11.0 (approx.), Close Down.

TUESDAY  
OCTOBER THE TENTH

## BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—4.0 p.m., Nietzsche Song Recital by Katharina Kirchheim (Soprano); Three Songs for Voice and Pianoforte: (a) Jung Fischerin, (b) Aus der Jugendzeit, (c) Nachspiel. Reading. Five Poems by Nietzsche set to Music by Georg Gähler: (a) Du hast gerufen, (b) In stillen Stunden, (c) Heimweh, (d) Schweifen o Schweifen, (e) Donnroschen. 4.50, Choral and Organ Recital by Blind Artists. 5.30, Funkstunde informs its Listeners. 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, Lottery Announcements. 7.5, At the Violin Maker's—A Radio Report. 7.25, Beethoven Concert by the Station Orchestra, conducted by Frickhofer. Soloist: Prof. Gustav Havemann (Violin): Overture in C, Op. 124, Die Weihe des Hauses; Concerto in D for Violin and Orchestra. 8.20, The Wisdom of the World in a Fool's Cap—Variety Programme. 9.0, News. 9.30 (approx.), See Hamburg. In the interval from 10.0 to 10.5, Talk: The Stage and Film World. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODEN.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.50, News and Exchange. 8.0, Gramophone Music. 8.15, News. 8.30, Symphony Concert relayed from Paris (Eiffel Tower).

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.50 p.m., Violin Recital: Czech Rhapsody, Op. 21 (Dndricek); Polonaise in A, Op. 4 (Wieniawsky); Viennese Caprice, Op. 2 (Kriesler). 5.15, Talk. 5.25, Gramophone Music. 5.40, Lesson in Morse. 5.55, Talk for the Housewife. 6.0, See Prague. 7.5, Symphony Concert by the Bratislava Symphony Orchestra, conducted by Karl Nedbal, relayed from the Slovak National Theatre; Soloist: Zofie Napravilova (Songs); Overture for Full Orchestra, Op. 50 (Holubek); Cycle of Songs, Op. 4, with Orchestral Accompaniment (Soehn); Symphonic Suite for Full Orchestra (Raiter); Symphony in G, No. 4 (Mahler). 9.0 to 10.0, See Prague. 10.0 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—1.10 p.m., Walter Schütt Song Recital by Alfred Rudolph (Baritone); Die Stadt; Und webte auch auf jenen Matten; Als ich dich kaum gesehn; Gefangen; Leonore; Auf der Gartenbank; Denn nicht; Der Dragoner; Der Grenadier; Im Feldquartier. 1.40, Gramophone Records of Classical Music. 2.0, Market Prices. 2.15, Review of Books on the German Frontier Problem. 2.36, Programme for Children. 3.0, Concert by the Station Orchestra, conducted by Ernst Topitz: Overture, Semiramis (Rossini); Suite, At the Circus (Armandola); Selection from Lakmé (Delibes); Waltz, Die Werber (Lanner); Selection from Die Folklinger (Kretschmer); Minuet (Bocherini); Suite campestre (Anadei); Rondo brillant for Clarinet (Wiedemann); Akelei (Ganglberger); Overture, Der Bettelstudent (Millbcker). 4.30, Market Prices. 4.32 (approx.), Talk: Luther's Struggle against Charles V and the Holy Roman Empire. 5.0, Flute Recital: Hungarian Fantasia (Doppler); Russian Carnival (Giardi); Concertino (Chaminade). 5.30, Political Press Review from Berlin (Deutschlandsender). 5.50, Meat Market Prices. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, News. 7.10, Choral Concert, relayed from the Konzerthaus. 8.10, Schlossballade Radio Play (Walter von Hollander). 9.30, Time and News. 9.55, Light Music and Dance Music from the Haus Metropol Hindenburg. 11.0 (approx.), Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission: News, Talk on Letter Writing and Agricultural Talk. 6.0, See Prague. 6.25, Reading. 6.40, Gramophone Music. 6.50, Programme to be announced. 7.5, See Bratislava. 8.5, The Wedding—One Act Comedy (Zoschenko). 8.30, See Prague. 10.0 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R.; 590 kc/s, 509 metres; 15 kW.—12 Noon, Operetta Music on Gramophone Records: Selection from White Horse Inn (Benatzky), The Desert Song (Romberg),

and Ciboulette (Hahn). 12.20 p.m., Pianoforte Recital by Jacques Stehman. First Prize Winner of the Brussels Conservatoire. Lesghinka (Liapunov); Sonata in D (Scarlati); Three Preludes (Stehman). 12.35, Opera Music on Gramophone Records: Selection from Penelope (Faure); Le Roi d'Ys (Lalo); and Romeo and Juliet (Gounod); Duet from Hansel and Gretel (Humperdinck); Selection from Tannhäuser (Wagner). 1.0 p.m., Le Journal Parlé. 1.10, Hot Jazz—Gramophone Concert. 5.0, Concert by the Symphony Orchestra, conducted by Kump; Overture, Le Carnaval romain (Berlioz); Suite No. 1 from Peer Gynt (Grieg); Suite of Viennese Waltzes (Gilsen). 5.30, Programme for Children. 6.5, Film Review. 6.15, Pianoforte Recital by Paulet: Sonata in A (Mozart); Ballade in F Minor (Chopin); Solei à midi (Jougen). 6.45, Sonata for Solo Violin (Bach). 7.0, Le Festin de l'araignée (Roussel), on Gramophone Records. 7.15, Report for Workers. 7.30, Art Notes and Review for Women. 8.0, Autumn Concert by the Station Orchestra, conducted by Walpot: Overture, La Chasse du jeune Henri (Méhul); Falling Leaves, from Thérèse (Massenet); Two Musical Sketches (Saey); Feuilles au vent (Gabriel Marie); Waltz, Autumn (Albeniz); Chasse joyeuse (Heller). 8.45, Interview with the President of the Confederation of Christian Syndicates: Christian Syndicates and Unemployment Benefit. 9.0, Concert by the Station Symphony Orchestra, conducted by Kump. Soloist, Abel Bourdaud (Violin). Overture, Gwendoline (Chabrier); Concerto No. 5 for Violin and Orchestra (Vieuxtemps); Spanish Rhapsody (Ravel). 9.40, Sonata de Camera for Flute, Cello, and Pianoforte (Pierné), on Gramophone Records. 9.55, Christus Vineit (Liszt). 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish. 12 Noon, Gramophone Concert of Light Music. In an interval at 1.0 p.m., Le Journal Parlé. 5.0, Concert by the Radio Orchestra, conducted by Walpot: March, Stars and Stripes (Souza); Suite of Modern Dances (Robrecht); Waltz, Wine, Woman, and Song (Joh. Strauss); Vibrant Solo, You are my Heart's Delight (Lehár); Xylophone Solo: Blues, Funny Notes (Nicholls); Selection from The Tales of Hoffmann (Offenbach); Marching Song (Eisler). 5.45, Programme for Children. 6.30, Gramophone Concert: Foxtrot, Manhattan; Waltz, Lelia; Foxtrot, It always starts to rain; Jazz-Intermezzo, Dancing Puppets; Tango, Miravilla; Foxtrot, If I could be with you; Tango, Miravilla; Foxtrot, A big Bouquet for you; One-Step, Rio de Janeiro; Waltz, For you; Foxtrot, You're just a Lover; Tango, Oh Rosalita; Foxtrot, My Cigarette Lady; When the Guards are on Parade. 7.15, Talk: Radio Interference. 7.30, Tourist Talk. 8.0, Mozart Concert by the Station Symphony Orchestra, conducted by Kump. Soloist, Mme. Weyler-Verhoeven (Songs). Overture, Figaro: Eine kleine Nachtmusik; Songs: (a) Wedding Song, (b) Ridente la calma, (c) Un moto di gioia; Minuet and French March; Overture, The Magic Flute. 8.45, Talk: A Nazi Concentration Camp. 9.0, Grieg Concert by the Radio Orchestra, conducted by Walpot. Soloist, Mme. Weyler-Verhoeven (Songs). Homage March; Two Norwegian Dances; Songs: (a) Die Prinzessin, (b) Ein Schwann, (c) Letzter Frühling, (d) Zwei braune Augen; Peer Gynt Suite No. 2. 10.0, Le Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Light Music and Romanian Music by the Motos Orchestra. In the interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Instrumental Music on Gramophone Records. 6.40, Educational Programme. 7.0, Song Recital by Mme. Babad. 7.20, Storm and Moonlight—Concert by the Station Orchestra. The Moonlight Sonata (Beethoven); Nocturne from A Midsummer Night's Dream (Mendelssohn); Abendlied (Schumann); Abendlied (Grieg); Clair de lune, from Werther (Massenet); Nocturne (Novak); Nocturne from Much Ado About Nothing (Körngold); Storm, from William Tell (Rossini); The Pastoral Symphony (Beethoven); Stormy Evening on the Coast, from the Peer Gynt Suite (Grieg); Prelude (Gliga); Overture, The Flying Dutchman (Wagner). In the interval at 8.0, Talk. 8.45, Radio Journal.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 840 metres from 6.25 p.m. till Close Down.—4.30 p.m., Gramophone Concert. 5.25, Dialogue. 6.0, French Lesson. 6.30, Ladislav Hunyadi—Opera in Four Acts (Erkel). After the Opera, Concert by the Rezsó Horváth Cigány Band from the Café Emke. Soloist:

Emmerich Laszlo (Songs). In the interval at 10.0, Talk in German: Hungary in the Autumn.

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall. 11.2, Concert by the Leonard Glydmark String Ensemble, relayed from the Bellevue Strandhotel. 1.0 p.m., Interval. 2.0, Concert by the Station Orchestra, conducted by Launy Granddahl. Overture, Le Brasseur de Preston (Adam); Waltz from The Sleeping Beauty (Tchaikovsky); Selection from La Traviata (Verdi); Norwegian Rhapsody, No. 3 (Svendens); March from Sigvard Jorsalfar (Grieg); Songs, Overture, Carnaval à Venise (Thomas); Siciliana (Gabriel-Marie); Symphonic Piece for String Orchestra (Schroder); Selection from Lucia di Lammermoor (Donizetti); Reverie orientale (Glazunov); Slav Dance, No. 1 (Dvorak); Tarantella from Napoli (Pavilli). 4.0, Programme for Children. 4.30, Exchange and Fish Market Prices. 4.45, Talk. 5.15, German Lesson. 5.45, Weather. 5.54, Wireless Notes. 6.0, Press Review. 6.15, Time Signal. 6.30, Talk: How to form a Radio Listener's Circle. 7.0, Time Signal from the Town Hall. 7.2, A Humorous Sketch. 7.20, Concert of English and American Music, The Station Orchestra, conducted by Emil Reesen. A Children's Overture (Quilter); Gipsy Waltz (Coleridge Taylor); Moorish Waltz (Coleridge Taylor); Serenade in E Minor for String Orchestra (Elgar); Variations on a once Popular Humorous Song (Haydn-Wood); Tarantella from the Gipsy Suite (German). 8.15, An Excursion with the Microphone. 8.45, Press Review. 9.0, Concert of Chamber Music. String Quartet in D, Op. 75 (Haydn); String Quartet in F Minor, Op. 95 (Beethoven). 10.0 (approx.), Close Down.

CORK.—See Athlone.

## CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Talk on Old Cracow. 6.20, Miscellaneous Announcements. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45 till Close Down, See Warsaw. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11. a.m. to 12 Noon, Programme in English by the I.B.C. 11.0, Happy Hour. Part I—Orchestral Concert: Les sirènes (Waldteufel); Woodland Peace (Favilla); Glockenspiel Solo: The Black Forest Chiming Clock (Doppler); Mon rêve (Waldteufel); Ocarina Solo: Under the Double Eagle (Tapiero); Wedgwood Blue (Ketelhey); Cœur brisé (Gillet); Waltz, Sari (Kálmán). Part 2—Dance Music: A Woman should stick to her man; Learn to croon; Thank Heaven for you; Down the old Ox Road; My bluebird's singing the Blues; I cover the waterfront; He was only a poor musician. Sweetheart Darlin'; Signature Tune. 12.0 Noon, Programmes in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.30, Programme for Children. 5.0, Organ Recital for Torquay and Exeter Listeners: Signature Tune; The Night by the Sea; Drifting down the Shalimar; My wishing Song; Hold me; Rain on the Roof; Xylophone and Organ Duet; Down South; Friends once more united; Clockwork. In the valley of the moon. 5.30, Concert of Gramophone Records for Plymouth and Devonport Listeners: Idylle bretonne (Gennin); My mother's garden (Hanley); Homing (del Riego); Sam's medal (Hogan); Pianoforte Solo: Selection from He wanted adventure; Reflections in the Water (Webster); We all go the same way; Pianoforte Solo: That futuristic Rag (Bloom); Signature Tune. 6.0, Programme in French. 10.0 till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune; Bells of Normandy; P.C. 123; Somebody stole my gal; Isn't it heavenly; Two Buck Tim from Timbuctoo; Let's all be happy together; Spanish Sweetheart; Tick, Tock; My Gipsy Rhapsody; My lucky day; It was a night in June; In Santa Lucia; It's Sunday down in Caroline; Thank Heaven for you; He was only a poor Musician; My Bluebird's singing the Blues; Learn to croon; Pop gun; Signature Tune. 11.0, Tunes from the Talkies: Signature Tune; Sittin' in the Dark; You're getting to be a habit with me; One little drink; Learn to croon; Come out Vienna; I got Rhythm; Let me give my happiness to you; You don't understand; Selection from The Crooner; Signature Tune. 11.30, Concert arranged by the International Broadcasting Company (Ireland), Ltd. on behalf of Hospitals Trust, Ltd.: Signature Tune; Come back to Erin; Salut d'amour (Elgar); Bacchanal from The Seasons (Glazunov); Irish Song Medley (arr. Griffiths); Humoresque (Dvorak); Song, Molly Bawn (Lover); Ballet Egyptian (Luigini); Suite, La Source (Delibes); Dream at Evening (Chaminade); Ballet from Petite suite (Debussy); Signature Tune, Come back to Erin. 12.5 a.m. (Wednesday),

OCT. 10th **TUESDAY** continued

News Bulletin in English. 12.10, Concert for Tamworth Listeners. Part 1: Signature Tune, The Chum Song; One hour with you; Cabin in the cotton; Get happy; A una rosa; One more kiss. Part 2—Electrical Transcriptions of Jack Payne and his Band: Sunlow in a little green hollow; Oh Johanna; Sweet dreams, pretty lady; Sweetheart darlin'; Adorable; Lazybones; Let's all be happy together; Let's call it a day; Signature. 1.0, Dance Music: Signature Tune, Bells of Normandy; Goodnight but not goodbye; And so I married the Girl; The old spinning wheel; Castles in the sand; Won't you stay to tea?; There's a tiny little hair upon your shoulder; When it's lamp-lighting time in the Valley; The language of love; My wishing song; You did everything for me; Hold me; That's my Home; Maybe I love you too much; Seven years with the wrong woman; The old spinning wheel; Avalon; Down in the valley; The village band; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

**FLENSBURG.**—See Hamburg.

**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, 1,220 kc/s, 245.9 metres; and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35, Classical Music on Gramophone Records. 1.30, Interval. 2.30, Weather. 2.40, Time and Economic Notes. 3.0, See Langenberg. 5.0, Italian Lesson. 5.20, Talk: Hans Böglin. 5.35, Talk: Experiences of a Publisher. 5.50, Weather and News. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, See Berlin (Deutschlandsender). 7.10, Carinthian Programme. 7.50, Concert. 8.20, See Berlin (Funkstunde). 9.0, Time and News. 9.20, See Stuttgart. 9.30, Local News and Weather. 9.45, Concert, from Langenberg. 10.0, Serenade, from Langenberg. 11.15 (relayed by Zeesen, 31.38 metres), Talk: The Psychology of the German Race. 12 Midnight, Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

Call ha, 806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 556 metres; and Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m., Transmission for all German Stations, relayed from Stuttgart. 7.0, See Berlin (Deutschlandsender). 7.10, New Gramophone Records. 7.30, Wo die Schwalben nisten—Play in Four Acts and a Prelude (Leo Kastner and Hans Lozenz). 9.0, Time and News. 9.30, Concert by the Station Orchestra, conducted by José Eihenschütz: Overture, Die sieben Raben (Rheinberger); Intermezzo from Cavalleria rusticana (Mascagni); Präludium (Järnefelt); Ballet Suite (Reger); Night on the Bare Mountain (Mussorgsky); Minuet (Bull); Selection from The Trumpeter of Sickingen (Nessler); Waltz, Donauweibchen (Jos. Strauss).

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert of German Music. In the intervals at 12 (Noon), Time and Weather, and at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office, with Gramophone Music. 2.30, Eurythmies for Children. 3.0, See Leipzig. In the interval at 3.50, Talk on Excursions. 4.50, Talk: The History of the Town and Castle of Insterburg, on the Three Hundred and Fiftieth Anniversary of the Town. 5.15, Market Prices. 5.25, Dialogue: The Daily Work of an East Prussian Commercial Traveller. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, See Berlin (Deutschlandsender). 7.10, Weather and News. 7.15 (from Danzig), Operetta Programme by the Danzig Municipal Theatre Orchestra, conducted by Ernst Senf; Selection from The Gipsy Baron (Joh. Strauss) and Der Bettelstudent (Müllbeck). 8.20, See Berlin (Deutschlandsender). 9.0, Weather and News.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m. and 20 kW.—5.40 p.m., Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.).—11.10 a.m., Violin and Pianoforte Recital: Le tombeau (Lecclair); Marche aux Tostis; Catari Catari (Cardillo); Italian Serenade (Linsky). 11.40, Concert of Light Music. Gramophone Music in the intervals. 1.55 to 2.10 p.m., Interval. 2.10, Gramophone Music. 2.40, Dressmaking Lesson. 3.40, Chopin, Pianoforte Recital: Ballad in F, Op. 38; Cradle Song in D flat;

Nocturne in B, Op. 62, No. 1; Rondo in E flat, Op. 16. 4.10, Gramophone Music. 4.40, Programme for Children. 5.10, Talk. 5.40, Gramophone Music. 6.10, Talk. 6.40, Concert by the Wireless Orchestra, conducted by Nico Treep: Overture, Berlin wie es weint und lacht (Conradi); Selection from Gri-Gri (Lincke); Two Pieces (Gillet): (a) Au moulin, (b) La toupie; Champagne Gallop (Lumbye). 7.10, English Lesson. 7.40, Time and News. 7.45, Concert by the Wireless Orchestra, conducted by Nico Treep: Jahrmachtsrunnel (Lincke); Waltz, Wiener Bürger (Ziehrer); Pumpernickel (Siede); Ballgüster (Meyer-Helmund); A Wedding in India (Percy); Jungle Drums (Ketelbey); Interlude by the Paradise Hawaiians: Barataria March (Sullivan-Konzak); Potpourri (Ciere); Dance of the Dervishes (Bendix); Orientzauber (Dieker); Time is money (Lincke); Love's Dream after the Ball (Zibulka); La Argentina (Nieland); Nights in Cairo (Gilbert); Wien bleibt Wien (Schrammel). 9.10, A Radio Play. 10.10, Gramophone Music. 10.40, News. 10.50, Concert of Light Music. 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,675 metres; 7 kW. (up to 3.40 p.m.). Transmitted from Kootwijk on 50 kW, from 3.40 p.m.—Programme of the Catholic Radio Society (K.R.O.). 11.55 a.m., Concert by the Vienna Station Octet. Motormarsch (Rosey); O Frühling wie bist du so schön (Lincke); Overture, The Italian Girl in Algiers (Rossini); Hungaria (Leopold); Invano (Micheli); Dance of the Dervishes (Bendix); Die kleinen Soldaten (Marx); Gramophone Music: Selection from Viktoria and her Hussar (Abraham-Dostal); Humoresque (Dvorak); Slav Dance, No. 8 (Dvorak); Waltz, Estudiantia (Waldteufel); Finale. 1.25 to 1.40, Interval. 1.40, Programme for Women. 2.40, Gramophone Music. 3.10, Recitations. 3.25, Recital by Mme. Dijs-Ochel (Songs), and Boshart (Pianoforte). Songs: (a) Im Kahne (Grieg), (b) Beim Sonnenuntergang (Grieg), (c) Der Jäger (Grieg), (d) All mein' Gedanken (R. Strauss), (e) Traum durch die Dämmerung (R. Strauss); Gramophone Music. Songs: (a) Ave Maria (Kabn), (b) Ninna-Nanna (Castellnuovo-Tedesco); Pianoforte Solos: (a) Pavane pour une Infante défunte (Ravel), (b) Au clair de lune (Debussy). 4.25, Recitations. 4.40, Concert by the Vienna Octet; El Capitan (Sousa); Erklängen zum Tanze die Geigen (Jessel); Overture, Frau Luna (Lincke); O Mädchen, Mein Mädchen, from Frederica (Lehár); Selection from The Czarevitch (Lehár); Potpourri (Morina); Selection from The Song of Songs (Moya); El Relicario (Padilla). 5.25, Gramophone Music. 5.40, Religious Address. 5.55, Octet Concert (cont'd.). Waltz Potpourri (Robrecht); Idylle passionelle (Ruzigade); Rusticarella (Cortopassi); Selection from Comtess Maritza (Kálmán); Two Guitars (Ferraris); Finale. 6.40, Police Notes. 6.55, Religious Talk. 7.15, Gramophone Music. 7.25, Educational Talk. 7.40, Concert by the K.R.O. Orchestra and the Utrecht Municipal Orchestra, conducted by Henri van Goudoever; Prelude to Lohengrin (Wagner); Selection from The Valkyrie (Wagner); Prelude to Parsifal (Wagner); Seventh Symphony (Bruckner). In the interval at 8.25 (approx.), News and Talk on Bruckner's Seventh Symphony. 9.55, Gramophone Music. 10.10, News. 10.15, Gramophone Music. 10.25, Concert by the Vienna Station Octet. 10.55, Gramophone Music. 11.10, Octet Concert (cont'd.). 11.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**KALUNDBORG.**—See Copenhagen.

**KATOWICE**

734 kc/s, 408 metres; 16 kW.—6.15 p.m., Announcements and Gramophone Music. 6.25, See Warsaw. 6.55, Sports Talk. 7.0 till Close Down, See Warsaw.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LAHTI**

167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—5.15 p.m., Talk. 5.40, Pianoforte Recital of Finnish Music. 6.5, Talk. 6.25, Song Recital. 6.45, Recitation. 7.5, Concert by the Station Orchestra, conducted by Haapanen. 7.45, News in Finnish and Swedish.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—12.35 p.m., Concert from Frankfurt. 1.30, Songs of the Hebrides—Talk with Gramophone Illustrations. 2.0, Talk on the Swabian Poet, Hermann Kurz and reading from his works. 2.30, Exchange. 2.50, Political Announcements. 3.0, Concert by the Fröhliche Fünf and Soloists: The Fröhliche Fünf; Andante from the Spanish Symphony (Lalo); La Precieuse (Couperin); Folk Song, Kommt ein Vogel geflogen The Spinner (Donatello); Variations on a Theme of Mozart (Sor); Minuet (Albert); The Fröhliche Fünf; Rondo in B flat (Weber); Bohemian Song (Pirani); Moment musical (Schubert); Saltarelle (Kossmann); The Fröhliche Fünf; Sonatina in F (Haesler); Rondo (Chopin); Humoresque, Vom Grashüpfer (Schmid); Hahn und gans (Schmid); Marehing Song, Wir sind jung (Stransky); The Fröhliche Fünf. 5.0, See Frankfurt. 5.35, Talk: Ferdinand Kürger, the veteran Wespallian Dialect Author. 5.50, News. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, See Berlin (Deutschlandsender). 7.10, See Frankfurt. 9.20, Talk from Stuttgart. 9.30, General News, followed by Weekly Review. 9.40, Light Music and Dance Music. 11.15, See Frankfurt. 12 Midnight, Close Down.

LAUSANNE.—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—12.30 p.m., Wine, Women and Song—Gramophone Concert. 1.15, News. 1.25, Talk on Art. 1.45, Book Review. 2.5, Down the Elbe—Radio Sequence. 2.35, Exchange and Market Prices. 3.0, Concert by the Dresden Philharmonic Orchestra, conducted by Hilmar Weber. Overture, Peter Schmall (Weber); Minuet and Variations from the Divertissement, No. 17 (Mozart); Alpine Suite (Hermann Grabner); Hungarian Rhapsody, No. 1 in F Minor (Liszt); Scandinavian Melodies (Grieg); Selection from The Taming of the Shrew (Goetz); Waltz, Seid unschlungen Millionen (Joh. Strauss). 4.50, Exchange, Weather and Time Signal. 5.0, Reading: The Blue Grotto of Capri (Heinrich Lersch). 5.20, Song Recital. 5.50, Review of the Day's News. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, Talk from Berlin (Deutschlandsender). 7.10, Programme for Boys. Part I: A Thousand Young Hitlerites Sing. Part II: Walter and Hildegund—Radio Play from the Old Germanic Legend (Arthur-Heinz Lehmann). 8.0, Symphony Concert by the Leipzig Symphony Orchestra, conducted by Theodor Blumer. Symphonic Pledge from La Donna Serpente (Casella); Symphonic Poem, Op. 16. Aus Italian (Richard Strauss). 9.0, News. 9.30, Talk: The Cosmic Rays. 10.0, Musical Programme (to be announced). 11.0 (approx.), Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., French Lesson. 6.30, History Lesson. 7.0, Baritone Recital of Slovak Songs. 8.30, Weather and News. 9.0, Light Music by the Station Orchestra. 10.0 (approx.), Close Down.

**LUXEMBOURG**

252 kc/s, 1,191 metres; 200 kW.—Belgian Evening. 7.30, Accordion Recital by Jean Meder. 8.15, Song Recital by Gustave Simon: La cloche fêlée (Knoepf); Kermesse (Delcroix); Jésus s'endort (Delme); Fiddité (Lambotte); L'Église paysanne (De Boeck); La sagesse (Jougen); Myrtha (Radoux-Rogier); La-bas (Moulaert); Le manoir bleu de Rosemond (Bouly). 8.50, News in French. 9.0, Concert by the Station Orchestra, conducted by Henri Pensis: Overture, Hamlet (Gade); Melody (Glazunov); Petite suite (Debussy); Songs of Spain (Albeniz); Interlude (Vreuls). 9.50, News in German. 10.0, Variety Music on Gramophone Records. 10.25, Dance Music by the Station Jazz Band conducted by Perry Jusá.

**LWOW**

788 kc/s, 381 metres; 16 kW.—6.5 p.m., Talk. 6.15, Announcements and Gramophone Music. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 10.5, Gramophone Music. 10.30 (approx.), Close Down.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.30 p.m., Radio Gazette for Lyons and the South-East. 8.30, Programme from Paris (Eiffel Tower). After the Relay, News.

**MADRID**

ARANJUEZ (EAJ), 9,860 kc/s 30.43 metres; 20 kW.—10.30 p.m., Concert of Popular Music. In the interval at 10.45, Radio Chronicle. 11.35, Spanish-American Talk. 11.45, Light Music; Programme in English by the I.B.C. 12 Midnight, Concert: Now I am in Love; The Cuban Love Song; Volga; The Land of Smiles; Beautiful Nice; Bidin' my time; Montana Moon; Fiesta. 12.30 a.m. (Wednesday), I.B.C. Goodnight Melody.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Radio Journal and Request Gramophone Music. In the interval. Talk. 8.15, Topical Review. 8.30 to 10.0, Interval. 10.0, Chimes, Time, and Topical Review. 10.20 (approx.), Musical Pro-

gramme. 12.15 a.m. (Wednesday), Topical Review. 12.30, Chimes. 1.0 to 2.0, Programme in English by the I.B.C.: Light Music: Sweetheart Darlin'; Street of Dreams; Mama Inez; Avalon; With you beside me; Nobody's Sweetheart; Cuban Love Song; Reflections in the Water; Wild Goose Chase; Blue Danube; Under a Blanket of blue; Song of the Islands; Love is the Thing; Learn to croon; Aloha Oe; Moonstruck. 2.0, I.B.C. Goodnight Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—4.50 p.m., Gramophone Music. 5.5, Talk: Creative Art in Ostrava. 5.15, Programme from Brno. 6.0, See Prague. 7.5, See Bratislava. 8.5, See Brno. 8.30, See Prague. 10.0 (approx.), Close Down.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather. 1.45, Weather Report. 2.0, Extracts from The Czar's Bride (Rimsky-Korsakov). 3.0, Reading from the Works of Marx and Lenin. 3.30, Literary and Dramatic Programme. 4.30, Literary Programme for Young People. 5.30, Symphony Concert. Symphony No. 4 (Brahms); Songs (Mahler and Wolf); Harry Janos (Kodaly). 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Orchestral Concert, conducted by Erich Kloss: Overture, Prince Methuselah (Joh. Strauss); Lyric Episode for String Quartet (Hornmann-Webau); Suite, Truderinger Kirchweih (Ridingner); Reverie (Scassola); Piedmontese Dance (Sinigaglia); Rose mouse (Bosc); Melody (Rosey); Selection from Die toten Augen (d'Alber). 4.45, Talk: With a Camera in Hellabrunn Park. 5.5, Lieder Recital by Ida Harth zur Nieden (Soprano). 5.25, Readings (Müller), with Introductory Talk. 5.45, Time, Weather and Agricultural Notes. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, See Berlin (Deutschlandsender). 7.10, Concert of Folk Music by the Fischer Quartet. 7.40, Talk: The German and Russian Revolutions. 8.0, Concert by the Station Orchestra, conducted by Winter. Soloist: Aho Schoen (Pianoforte); Rondo for Pianoforte and Orchestra (Beethoven); Third Suite for Orchestra (Tchaikovsky). 9.0, The Funeral—Comedy (Lankes). 9.20, Time, Weather, News and Sports Notes.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW.—Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Orchestral Concert. 5.0, Programme for Housewives. 5.45, Saxophone Solos. 6.0, News. 6.30, English Lesson. 7.0, Time Signal. 7.2, Talk on Johan Herman Wessel, the Norwegian Poet, with recitations from his works. 7.30, Orchestral Concert. 8.0, Political Talk by the Parliamentary President, C. Hambro (Conservative). 8.20, Orchestral Concert (cont'd.). 8.40, News. 9.0, Topical Talk. 9.15, Concert by the Jacobsen Horn Ensemble. 9.45, (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopplavoro Announcements, Tourist Talk, Agricultural Report, and Giornale Radiop. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Tavadot—Opera in Three Acts (Puccini). Talk and Announcements in the interval. After the Opera, News.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Music. 7.15, Le Journal Parlé. 7.30, Gramophone Music. 8.0, Legal Talk. 8.5, Film Review. 8.35, Phœbus and Pan—Cantata (Bach) for Orchestra, Choirs and Soloists; Symphony No. 6—The Pastoral (Beethoven). 10.30, News.

**PARIS**

RADIO-PARIS. Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m., Weather and Physical Culture. 7.45, Gramophone Music: Burlesques (Krebs); Gavotte en Rondeau (Lully); Minuet (Mozart); Bourrée fleurie (Lorenzetti-casadesus). 8.0, Weather and Press Review. 12.0 Noon, Gramophone Concert: Part I—French Opera Music: Seven Airs from Samson and Delilah (Saint-Saëns); Air from Henri VIII (Saint-Saëns); Melody from Aseano (Saint-Saëns); Aria from Parasytis (Saint-Saëns); Melody from Patrie (Paladilhe). Part 2—Nineteenth Century Russian Opera Music: Four Airs from Prince

OCT. 10th **TUESDAY** continued

Igor (Borodin); Prelude to Khovantschina (Mussorgsky); Four Airs from Boris Godunov (Mussorgsky); Three Songs from Sadko (Rimsky-Korsakov); Lel's Song from The Snow Maiden (Rimsky-Korsakov); Selection from The Golden Cockerel (Rimsky-Korsakov); Three Melodies from Eugen Onegin (Tchaikovsky); Two Arias from The Queen of Spades (Tchaikovsky). In the interval at 1.0 p.m., Exchange, News and Weather, and at 1.30, Exchange, 2.0, Exchange, 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.50, Gramophone Music: Pimpelle (Abita); Mary Ann (Abner Silver); Heart and Mind (Abraham). 7.0, Notes on Art. 7.20, Dance Music on Gramophone Records. 7.45, Review of the British Press. 8.0, Gramophone Records: Fête polonaise from Le Roi malgré lui (Chabrier); Retour de Vèpres (Busser); Waltz (Chopin). 8.15, Review by Dominique Bonnard. 8.30, Concert relayed from the Conservatoire. Conductor: Paul Monteux. Soloist: Marjorie Lawrence (Songs): Symphonie Fantastique (Berlioz); Overture (Talliferre); Penthésilée—Lyric Poem for Voice and Orchestra (Bruneau); La Peri (Dukas); Overture, Kamuntcho (Pierné). In the interval at 9.15, Press Review and News.

**PITTSBURGH**

KDKA, 980 kc/s, 306 metres; 50 kW. Relay by W8XK on 48.86 metres and 25.27 metres.—8.0 p.m., Programme to be announced. 8.15, Words and Music, from New York. 8.45, Congress of Clubs. 9.0, Brown Palace Orchestra. 9.15, Meredith Wilson's Orchestra. 9.30, News and Markets. 10.0, Uncle Tom and Betty. 10.15, Kiddies Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News. Piano Classique. 11.15, Sports. A Song. 11.30, Pittsburgh Spotlights. 11.45 to 12.30 a.m. (Wednesday), New York relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15, Marvellous Melodies. 12.30, What Would You Do? 12.45 to 2.30, New York Relay. 12.45, Carney's Dog Chats. 1.0, Crime Clues. 1.30, Adventures in Health. 1.45, The Rollickers. 2.0, Pastorale. 2.30, Pedro Via's Orchestra. 3.0, Musical Memories, from New York. 3.30, Miniature Theatre, from New York.

PORSGRUND.—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Karel Ancerl: Ballet Music from The Two Widows (Smetana); Selection from Jacobin (Dvůrák); German Dances (Schubert); The Lovers, from the Slovak Suite, Op. 32 (Novak); Serenade (Suk); Scherzo and Wedding March from A Midsummer's Night's Dream (Mendelssohn). 3.55, Programme for Children. 4.15, Talk for Workers. 4.25, Gramophone Music. 4.35, German Lesson. 4.50, Gramophone Music. 5.5, Agricultural Talk. 5.15, Topical Talk. 5.25, News in German. 5.30, German Transmission—Persecution—a Play (Hözlín). 6.0, Time and News. 6.10, Talk: Foreign Students. 6.25, Concert by the Bohemians (Accordions). 6.40, A Tour round the World on Gramophone Records—Black Africa (Karel Capek). 7.5, See Bratislava. 8.5, See Brno. 8.30, String Quartet in D, Op. 30, No. 2 (Fœrster), by the Ondricek Quartet. 9.0, Time and News. 9.15, Dance Music by the Jaroslav Cech Orchestra. 10.0 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Gramophone Concert. 12 Noon (from Lausanne), Financial News. 12.10 p.m. (from Lausanne), Gramophone Concert; Part I: Duets; Part II: Light Music; Part III: Brahms Pianoforte Music, played by Backhaus. 1.0 to 2.28, Interval. 2.28, Time Signal from Neuchâtel Observatory. 3.30 (from Lausanne), Concert by the Small Radio Lausanne Orchestra. 4.0 (from Lausanne), Programme for Women. 4.30 to 6.0, Interval. 6.0 (from Geneva), Music Criticisms. 6.15 (from Geneva), News, Announcements, and Weather. 6.45 (from Geneva), Wireless Notes. 7.0 (from Lausanne), Théodore Botrel—Programme of Literature and Music. 8.50, News and Weather. 9.0 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

**REYKJAVIK**

260 kc/s, 1,200 metres; 21 kW.—8.5 p.m., Musical Programme. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, Chimes and News. 9.30, Reading. 10.0, Pianoforte Recital by Amil Thoroddsen, followed by Arias on Gramophone Records.

**RIGA**

525 metres; 15 kW.—6.5 p.m., Verdi Concert. 7.0, News. 7.20, Concert (contd.). 7.40, First Suite for Orchestra (Massenet). 8.0, Weather and News. 8.15, Concert. 9.15 (approx.), Close Down.

RJKAN.—See Oslo.

**ROME**

Call 190, 680 kc/s, 441 metres; 50 kW. Relay by Naples, 941 kc/s, 319 metres; Milan

(Vigentino), 662 kc/s, 453.2 metres, from 7.30 p.m. (approx.), and 290, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—12 Noon, Trio Concert from Turin. In the interval from 12.30 to 12.45 p.m., Giornale Radio and Exchange. 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15 to 5.0, Orchestral Concert: Scusi, signora (Sini); Tarantella (Martucci); Guitar Solo, Moonlight (Serrill); Hungarian Caprice (Ferraris); Selection from Tell me to-night (Spoliensky); Waltz, Amaryllis (Escobar); Danza annamita (Hamud); Se diventassi un gran signora (Mascheroni). 5.40 (Naples), Shipping and Sports Notes. 5.45, Morse Signals and Dopolavoro Report. 6.0, Tourist Report. 6.10, Grain Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Sponsored Music. 7.25 (approx.), Talk on the following Transmission. 7.30, See Turin. Talk and News in the interval. Giornale Radio after the Opera.

SALZBURG.—See Vienna.

**SCHENECTADY**

WGY, 790 kc/s, 379.5 metres; 50 kW. Relay at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—12.45 to 3.45 a.m. (Wednesday), New York Relay. 12.45, Stock Reports. 1.0, Blackstone Plantation. 1.30, Wayne King's Orchestra. 2.0, Ben Bernie's Orchestra. 2.30, Popular Programme. 3.0, Lives at Stake. 3.30, Variety Programme. 3.45, National Radio Forum, from New York, followed by Programme Résumé.

**SCHWEIZERISCHER LANDESENDER**

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 a.m. to 6.5 (from Berne), Gymnastics. 10.59, Time Signal from Neuchâtel Observatory. 11.0 (from Zürich), Concert of Light Music. 11.30, Time, Weather and News. 11.40. (from Zürich), Concert (contd.). 12.25 p.m., (from Zürich), Time, Weather and Exchange. 12.30 (approx.) to 4.0, Interval. 4.0 (from Zürich), Concert by the Small Station Orchestra, conducted by Scherbaum. 4.30 (from Basle), Concert by the Station Quartet. 5.30 (from Basle), The Circus—A Programme for Children. 6.0 (from Basle), Time, Weather and Broadcast for Schools. After the Programme, Austrian Music on Gramophone Records. 6.45 (from Basle), Talk: Prince Eugene. 7.15 (from Basle), Concert by the Rheinfelden Mixed Choir, conducted by Kammerer. 8.0, Weather and News. 8.10 (from Basle), Organ Recital. 9.15 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relay by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—1.45 to 2.10 p.m., Broadcast for Schools. 4.5, Programme for Children. 4.30, Gramophone Music. 5.30, The Practical Corner. 5.45, French Lesson. 6.15, Weather and News. 6.30, Talk on International Economics. 7.0, Chopin Pianoforte Recital by Gummar de Frumeric. Ballad in A Flat; Prelude in C Sharp; Barcarolle; Scherzo in B Minor. 7.30, Literary Review, relayed from Malmö, 1,301 kc/s, 231 metres. 8.0, Concert by the Station Choir. 8.30, Radio Report. 8.45, Weather and News. 9.0, Light Orchestral Concert, relayed from Malmö. Waltz from Der Rosenkavalier (R. Strauss); Piece (Peterson-Berger); Selection from Katja the Dancer (Gilbert); Barcarolle (Hradecsky); Humoresque for Violin and Pianoforte (Andersberg); Hellmesberger Potpourri (Ischpold); Waltz, Foxtrot (Jurmann and Kaper). 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Variety Music on Gramophone Records. 12 Noon, Orchestral Concert, conducted by Maurice de Villers: Marche Bohémienne (Chauvet); Waltz, Lustige Wien (Joh. Strauss); Overture, Si j'étais roi (Adam); Selection from Le postillon de Longumeau (Adam); Suite gaie (Gabriel-Marie); Symphonic Sketches (De Taeye); Suite phrygienne (Brüsselmans); Suite, A Mediterranean Voyage (Jalowicz); Ballet Music from Parysatis (Saint-Saëns). 2.0, Interval. 4.45, Talk on the French Colonies: Reorganisation of Morocco. 5.0, Orchestral Concert, conducted by Roskam: Marche exotique (Heinecke); Waltz (Petras); Song, Le mariage des roses (Frank); Overture, The Crown Diamonds (Auber); Selection from The Gipsy Princess (Kálmán); Intermezzo, Réverie (Ganne); Orchestral Suite, En terre celtique (Duhamel); March, Novelty (Peloud). 6.0, History Talk. 6.15, Topical Talk.

6.30, Orchestral Concert, conducted by Maurice de Villers: Kermesse (Pierné); Pastorale (Pierné); Overture, Ilka (Doppler); Selection from Elektra (R. Strauss); Nocturne (Debussy); Esquisses symphoniques (Debussy); Divertissement on Russian Songs (Rabaud). 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Programme from Paris (Eiffel Tower). 10.30 (approx.), Close Down.

**STUTTGART**

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relay by Freiburg, 527 kc/s, 570 metres.—12.35 to 1.30 p.m., See Frankfurt. 2.30, Gramophone Records from the Opera, The Bartered Bride (Smetana). 3.0, See Langenberg. 5.0, See Frankfurt. 5.35, Tales of the Great War. 5.50, Time and Market Prices. 6.0, Transmission for all German Stations. Music by A Children's Orchestra, and Children's Choir. 7.0, See Berlin (Deutschlandsender). 7.10 to 8.20, See Frankfurt. 8.20, See Berlin (Funkstunde). 9.0, See Frankfurt. 9.20, Talk: You must know. . . 9.30, Local News, followed by Gramophone Music. 10.0, Programme from Langenberg. 11.15, See Frankfurt. 12 Midnight (approx.), Close Down.

SUNDSVALL.—See Stockholm.

**TOULOUSE**

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Argentine Music. 6.30, Sound Film Music. 6.45, Military Music. 7.0, Songs. 7.15, News, Exchange, Market Prices and Exchange. 7.45, Bal musette Music. 8.0, Concert of Opera Music: Overture, Mignon (Thomas); Intermezzo from I Pagliacci (Leoncavallo); Selection from Cavalleria rusticana (Mascagni); Beloved Swan from Lohengrin (Wagner); Aria from The Damnation of Faust (Berlioz); The King of Thule from Faust (Gounod); Aria from Hérodiade (Massenet). 8.30, Orchestral Music. 9.0, Concert of Italian Music: Melody from Aida (Verdi); Torna a Sorrento (de Curtis); Recondita harmonia from Tosca (Puccini); La Campana di San Giusto (Arena); Rosina's Aria from The Barber of Seville (Rossini); Selection from Andrea Chenier (Giordano); Miserere from Il Trovatore (Verdi); Neapolitan Melody. 9.30, Music by a Viennese Orchestra: Narcissus (Nevin); Pluie d'or (Waldeufel); Selection from Maritana (Wallace). 9.45, Opera Music: Duet from I Pagliacci (Leoncavallo); Aria from Le Roi d'Ys (Lalo); Melody from Le Châlet (Adam). 10.0, Orchestral Music. 10.15, North-African News. 10.30, Concert of Operetta Music for Listeners in Morocco. 11.0, Chansonnettes. 11.5, Organ Solos. 11.55, Dance Music. 12 Midnight, News, Weather and Announcements. 12.5 a.m. (Wednesday), Hawaiian Guitar Music. 12.15, Orchestral Music. 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

TRONDHEIM.—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relay by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Dance Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolavoro Announcements and Gramophone Music. 6.0, Time, Report of the Royal Geographical Society, and Gramophone Music. 6.10, Agricultural Notes and Market Reports. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements. Giornale Radio, Sports Notes, and Weather. 7.25, Introductory Talk on the Following Transmission. 7.30, William Ratcliffe—Opera in Three Acts (Mascagni). In the intervals, Talk and Art Notes. After the Opera, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning), and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—11.0 to 11.5 a.m., Religious Information in English. 8.0 to 8.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relay by Graz, 862 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres, and Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer: Basque March (R. Glück); Waltz, Pikanterien (Lehar); Potpourri, Wiener Spaziergänger (Komzak); Overture, Prince Meuselahl (Strauss); Song, Gute Nacht du mein herziges Kind (Abt); Viennese Waltz Song (Fueck); A Dream Idyll (Keteibey); Venetian Serenade (Burgmein); Spanish Serenade (Burgmein); Ein Waldkonzert (Eilenberg); Song, Einmal kommt der Tag (Benatzky); Selection from Der Obersteiger (Zeller). In the interval at

10.55, Weather. 12 Noon, Time, Weather and Announcements. 12.10 p.m., Famous Artists on Gramophone Records. 1.0, Interval. 2.0, Time, Weather and Exchange. 2.20, Talk: Photography by Artificial Light. 2.35, Programme of Modern Children's Songs. 2.55, Music from Sound Films on Gramophone Records. 3.35, Handwork for Children. 4.10, Talk: Gymnastics the Foundation of all Sport. 4.25, Violin Recital by Willy Boskovsky: Prelude, Loure and Gavotte from the Martita in E (Bach); Violin and Pianoforte Sonata in B flat (Mozart); Melody (Tchaikovsky); The Flight of the Bumble-Bee (Rimsky-Korsakov); Waltz Caprice (Wieniawski); Sonata (Paganini). 5.5, Talk: Austria's Contribution to German Mysticism. 5.36, Elementary French Lesson. 6.0, Technique and Sport in Music—Concert by the Wiener Symphoniker, conducted by Paumgartner: The Iron Foundry (Mossoff); Prelude to a Boxing Match (Tcherepin); Symphonic Poem, Rugby (Honegger); Sinfonia tecnica (Zador); Symphonic Poem, Pacific 231 (Honegger). In the interval at 6.35, Time, Weather and Announcements. 7.15, Discussion: Parachutes. 7.30, Topical Talk. 7.45, Concert of Carinthian Music for the Anniversary of the Plebiscite; The Vienna Chamber Music Orchestra, conducted by Jaschka; Carinthian March (Seifert); Waltz, Am Wortheser (Koschat); Fantasia, From the Hills of Carinthia. 8.15, Concert by the Vienna Chamber Orchestra, conducted by Jascha: Overture, To the Story of the Lovely Melusina (Mendelssohn); Suite, In Norway (Coard); Intermezzo from Cavalleria rusticana (Mascagni); Ballet Music from Faust (Gounod); Overture, Wiener G'schichten (Hellmesberger-Jascha); Military March (Schubert). 9.15, News, Weather and Exchange. 9.30, Jack Payne and his Band (on Gramophone Records). Foxtrot, The Old Spinning Wheel (Hilli); Foxtrot, Hiawatha's Lullaby (Young); Slowfox, Lullaby of the Leaves (Young); Foxtrot, It ain't no fault of mine (Williams); Waltz, When the wild wild roses bloom (Woolsey); Slowfox, Stormy Weather (Koehler); Foxtrot, How deep is the Ocean (Irving Berlin); Foxtrot, Always in my Heart (Turk); Slowfox, By the Sycamore Tree (Gillespie); Waltz, Let's all sing like the birdies sing (Hargreaves); Foxtrot, When the morning rolls around (Campbell); Foxtrot, Please (Robin); Waltz, Masquerade (Webster); Foxtrot, Smile and sing cares away (Scott-Coomber); One-step, I'd like to see a game of football (Evans); Waltz, Play, fiddle, play (Lawrence); The Lord Mayor's Show (Sarony); Foxtrot, Hey hey Fowler! After the Programme, Announcements.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Dance Music by the Wilkosz Jazz Band. 11.30, Radio Journal and Weather. 11.35, Dance Music (contd.). 12 Noon, Interval. 2.30 p.m., Economic Notes. 2.40, Talk with Gramophone Illustrations: The Quartets of Beethoven. 3.25, Announcements. 3.40, Answers to Correspondence. 3.55, Concert of Sixteenth Century Music by the Station Orchestra, conducted by Glinksi. Soloists: Szabraska (Songs), and Dworakowski (Violin). Introductory talk. Extracts from a Suite (Praetorius); Dance Suite (M. Franck); Violin Concerto in A Minor (Vivaldi); Extracts from La rappresentazione (Cavaliere); Prologue to Euridice (Peri); Recitative and Aria from Arianna (Monteverdi); Concert grosso, No. 8 (Corelli). 4.50, Agricultural Notes. 5.0, Talk: Naturalism in Landscape Painting. 5.20, Pianoforte Recital by Szpinalski. Three Pieces (Paderewski); (a) Melody in G, (b) Nocturne in G Flat, (c) Cracovienne fantastique; Two Pieces (Rachmaninov); (a) Prelude in G Sharp Minor, (b) Polka; Spinning Chorus from The Flying Dutchman (Wagner-Liszt); Two Pieces (Debussy); (a) Reflets dans l'eau, (b) Puck's Dance; Bourée fantasque (Chabrier). 6.5, Miscellaneous Items. 6.25, Topical Talk. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Concert by the Symphony Orchestra, conducted by Oziminski. Soloist: Downar-Zapolska (Soprano); Overture, Flys (Moniuszko); Suite (Chopin-Balakirev); Aria from La Traviata (Verdi); Two Arias from Lakme (Delibes); Aria from Louise (Charpentier); Solitude on the Mountain (Bull Svendsen); Slav Rhapsody (Ovinsky); Dance of the Brigands from Janek (Zelenski); Valse triste (Nedbal); Introduction and Cracovienne from The Wedding at Ojcow (Korpiński); Spanish Dance from the Ballet, Monte Cristo (Moniuszko); Soprano Solos: (a) Aria from The Magic Flute (Mozart), (b) Song (R. Strauss); Waltz (J. Strauss); Peasant Dance (Polinski); Mazurka (Lewandowski); In the interval at 8.0, Reading from The Adventures of a Black Girl in her Search for God (Bernard Shaw). 9.0, Sports Notes. 9.10, Dance Music. In the interval at 10.0, Weather and Police Notes.

**WILNO**

533 kc/s, 563 metres; 16 kW.—6.20 p.m., Miscellaneous Announcements. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 7.0, Symphony No. 9 (Beethoven) on Gramophone Records. Introductory Talk by M. Huliewicz. 9.0 till Close Down, see Warsaw.

ZURICH.—See Schweizerischer Landessender.

# WEDNESDAY

## OCTOBER THE ELEVENTH

### ALGIERS

824 kc/s, 364 metres; 13 kW.—7.20 p.m., Songs from Opera. 7.55, News. 8.0, Time Signal. 8.2, Lottery Results. 8.10, Symphony Concert: Overture, Tannhäuser (Wagner); Cello Concerto (Saint-Saëns). 8.45, News. 8.50, Arias from Opera. 9.0, Concert (contd.): Pavane pour une Infante défunte (Ravel); La Procession nocturne (Rabaud); Danccs from Prince Igor (Borodin). 9.40, News. 9.45, Recitations. 9.55, News.

### ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time, Weather, Stock Report and Gramophone Music. 6.0, Programme for Children. 6.45, News. 7.0, Gaelic Talk. 7.15, German Lesson. 7.30, Time Signal. 7.31, The Station Orchestra. 8.0, Song Recital by Mr. and Mrs. P. J. Duffy. 8.15, The Station String Orchestra. 8.30, Song Recital (contd.). 8.45, The Station Orchestra. 9.0, The Matchmaker by the Metro-Radio Players. 9.30 to 10.30, Programme by the I.B.C. (Ireland) Ltd. 9.30, Orchestral Concert: Selection from Manon (Massenet); Aria from Il Trovatore (Verdi); Ballet Music from Rosamund (Schubert); Wireless World Announcement; Selection from La Bohème (Puccini); Prelude to Carmen (Bizet); Frühlingsstimmen (Strauss). 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of Hospitals Trust, Ltd.: Log along (Arnold); My Wishing Song (Burke); They've taken away my Sally (Traynor); Racing Commentary; I lay me down to sleep (Wrubel); When my little Pomeranian; Tonight (Valero); When the Moon came out (Miller). 10.30, I.B.C. Goodnight Melody, followed by News and Weather. 10.40, Traditional Trio. 11.0 (approx.), Close Down.

### BARCELONA

EAJL, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio (Contest: Selection from Samson and Delilah (Saint-Saëns); Minuet (Gervasio); Cantabile (Cui); Selection from Tannhäuser (Wagner); Canzonetta (Tchakovsky); An den Frühling (Grieg); Selection from La Navarraise (Massenet). 7.0, Request Gramophone Records. 7.30, Exchange and Gramophone Records (contd.). 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices. 9.5, Concert by the Radio Orchestra. 10.0, Reading of Poems (Quintana). 10.15, Concert. In the interval at 11.0, News. After the Concert: Gramophone Music. 12 Midnight (approx.), Close Down.

### BARI

1,112 kc/s, 269.8 metres; 20 kW.—11.30 a.m., Quintet Concert. 12 Noon (approx.) to 3.30, See Rome. 3.30, Programme for Children. 3.55 to 5.35, See Rome. 5.35, News in Albanian. 5.45 (approx.) till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

### BELGRADE

397 kc/s, 430.4 metres; 2.8 kW.—5.55 p.m., Time and Programme Announcements. 6.0, Concert by the Station Orchestra. 7.0, An Opera relayed from the National Theatre. In an interval at 8.30, Time and News. After the Opera, Dance Music on Gramophone Records.

### BERLIN

DEUTSCHLANDSENDER (Reichsander), 183.5 kc/s, 1,635 metres; 80 kW.—1.0 p.m., Gramophone Concert. Wilhelm Backhaus (Pianoforte); Berceuse (Chopin); Pablo Casals (Cello); Moment musical (Schubert); Dusolina Giannini (Soprano); Aria from Aida (Verdi); Enrico Caruso; Aria from Rigoletto (Verdi); Claudio Arrau (Pianoforte); Waltz in F (Chopin); Ivar Andresen (Bass); In diesen heiligen Hallen (Mozart); Laszlo Szentgyörgyi (Violin); Malagueña (Sarasate); Mafalda Salvatini (Soprano); Verrätene Liebe (Cornelius); Alfred Piccaver (Tenor); Legend of the Grail from Lohengrin (Wagner); Alexander Brailowski (Pianoforte); (a) Ballad in G Minor (Chopin); (b) Etude in A (Chopin) 2.0, Programme for Children. 2.30, Weather and Exchange. 2.45, Reading. 3.0, See Hamburg. 4.0, Talk: Twenty-Four Hours in a Lighthouse. 4.15, Topical Programme. 4.30, Music of the Eighteenth Century—Song and Pianoforte Recital by Eva Knopf (Songs), and Adolf Schütz. Sonata in A (Carl Philip Emanuel Bach); Polonaise in F (W. F. Bach); Songs: Kunst des Küssens Von der Modenarrtheit; Ein Mädchen, das auf Ehre hielt; Nonnelied; Die Jugend; Interessierte Heirat; Glück. 5.0, Poems. 5.5, Religious Address and Sacred Music. 5.55, Wireless Technical Talk. 5.50, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, To-day's Motto. 7.5, The Art of being a Crook—Warning against a dangerous profession—a Literary Radio Sequence (Klaus Richter). 8.0, Favourite Dance Bands. Gramophone Concert. 9.0, News. 9.45, Weather. 10.0, Programme from Hamburg. 11.0 (approx.), Close Down.

### BERLIN

FUNKSTUNDE; 715 kc/s, 419.5 metres; 1.5 kW.—3.30 p.m., Concert from the Café Corso at the Zoological Gardens: Waltz, Die Schönbrenner (Lanner); Serenade, Carmen-cita (Manfred); Polka-Intermezzo, Wenn der

Wecker weckt (Landschulz-Schoppe); Tango, Fern im sonnigen Süden (Fronke-Klahunde); Tango (Clutsam-Wiga); Waltz, Es rauscht das Meer (Kauler); Es war an der alten Mühle im Park von Sanssouci (Niel). 4.10, Lyric Suite for Soprano and Six Instruments (Hans Chemin-Petit). 4.25, The Theatre: Interviews with Hildegard Barko, Clara Savio, and Ruth von Zerboni. 4.45, Bach Organ Recital: Prelude and Fugue in G; Toccata and Fugue in D Minor. 5.5, See Berlin (Deutschlandsender). 5.35, The Funkstunde informs its Listeners... 5.45, Topical Talk. 6.0, Transmission for all German Stations: Rheinsberg. 7.0, Lottery Announcements. 7.5, Recital of Folk Songs. 7.40, A Trip to Berlin in the Olden Days—Humorous Sketch (Louis Angely). 8.30, Topical Programme. 9.0, News. 9.15 (approx.), Dance Music from the Sprengarten, Treptow. In the interval from 10.0 to 10.5, Radio Report from Moabit. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender. BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

### BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.55 p.m., Hungarian Programme—Talk, followed by Pianoforte Recital; Old Dance Melodies (Bela Bartok); Suite, Op. 14 (Bela Bartok); Hungarian Melodies (Weiner). 5.55, Hints for the Housewife. 6.0, See Prague. 6.10, See Moravská-Ostrava. 6.25 to 9.15, See Prague. 9.15 (approx.), Close Down.

BREMEN.—See Hamburg.

### BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.45 p.m., Time, Weather, News and Exchange. 1.10 (from Gleiwitz), Recital of Rhine Songs and Student's Songs by Walter Geiser (Baritone). 1.40, Gramophone Concert. 2.0, Agricultural Prices. 2.15, Concert by the Station Orchestra, conducted by Rischka: Overture, The Princess in the Golden Slippers (Rust); Sorenade (Juel-Fredrikson); Selection from Fidelio (Beethoven); Norwegian Wedding Procession (Grieg); Canzonetta (Boccherini); In Sunny Spain (Elliot); Waltz, Bürgerweisen (Strauss); German Colonial March (Harder). 3.0, Talk: Teaching Love of Nature in the Modern Schools. 3.30 (from Gleiwitz), Concert by the Gleiwitz Orchestra: Jetzt wird's gemütlich (Leuschner); Bavarian Ländler and Clog Dances (Dachsberger); Immer lustig und adel (Gulden). 4.10, Readings from Upper Silesian Authors. 4.30, Agricultural Prices. 4.35 (approx.), Concert by the Gleiwitz Women's Voice Quartet: Quartets (Brahms); Nun stehen die Rosen in Blüte, Die Berge sind spitz, Am Wildbach die Weiden, Minnelied, Der Bräutigam, Fragen, Gesang der Fingal; Three Folk Songs (arr. Fuchs): (a) Das zerbrochene Ringelien, (b) Heimliche Liebe, (c) Das Lieben bringt gross' Freud; Two Folk Songs (arr. May): (a) Dort unter in jenem Tale, (b) Wenn zu meinem Schätzel kommt. 5.0, Industry in Silesia: Radio Report from a Steel Works. 5.30, Programme to be announced. 5.50, Market Prices. 6.0, Transmission for all German Stations relayed from Berlin (Funkstunde). 7.0, News. 7.10, The Silesia Falstaff—Radio Comedy (Schall). 8.10, Military Band Concert of Soldiers' Songs and Marches. 9.0, See Munich. 9.20, Time, Weather and News. 9.45, Military Band Concert (contd.). 11.0 (approx.), Close Down.

### BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission: News, Talk on Protection of Animals, Talk for Workers and Educational Talk. 6.0, See Prague. 6.10, See Moravská-Ostrava. 6.25, A Radio Report from the Chicago World's Fair. 6.55, Gramophone Music. 7.0, See Prague. 9.30 (approx.), Close Down.

### BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Orchestral Concert, conducted by Leemans. In the interval at 1.0 p.m., Le Journal Parlé. 1.10, Orchestral Concert, conducted by André Felleman, from the Grand Hotel, Antwerp. 6.0, Dance Music relayed from the St. Sauveur Palais de Danse. 6.0, Talk: The Ambly Valley. 6.15, Pictures from an Exhibition (Mussorsky-Ravel) on Gramophone Records. 6.15, L'homme qui fait parler les morts—Sketch (Lauville). 7.0, Delcroix Pianoforte Recital by Jeanne Graindore: Five Sketches; Slow Dance. 7.15, Stenka Razin (Glazunov) on Gramophone Records. 7.30, Medical Talk. 8.0, Suite, Falstaff (Elgar) on Gramophone Records. 8.30, Hamlet, Prince of Denmark—Tragedy (Shakespeare) adapted for the Radio by Jean Variot. 9.25, Concert, conducted by

Felleman, relayed from the Grand Hotel, Antwerp.

### BRUSSELS (No. 2)

I.N.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish. 12 Noon, Concert of Light Music relayed from the Grand Hotel, Antwerp. Conductor: André Felleman. March (Ciere); Selection from Madame Butterfly (Puccini); Foxtrot, Akrobatik (Capshat); Selection from Marietta (O. Straus); Saxophone Solo (Phillips); Foxtrot (Buehholz); Foxtrot, Speaking of the Devil (Manner). 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans. Soloist: Gilman (Flute). Marche sçgovienne (Berry); Scènes brabantines (Sarly); Selection from Rip (Planquette); Flute Solo: Concert Mazurka (Doppler); L'orgue de barbare (Candiolo); Tango, Jealousy (Gade); Selection from White Horse Inn (Benzky-Stolz); Foxtrot, Crazy People (Leslie-Monaco). 5.0, Acts II and III of Andrea Chénier—Opera (Giordano) on Gramophone Records. 6.15, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Der Waffenschmied (Lortzing); Suite, An Evening in Lilliput (Berry); Violin Solo: Berceuse (Sneys); Gentiment (Saeys); Selection from The Queen of Sheba (Gounod); Night in the Bay of Palma (Turina); Melody from the Suite, En Bretagne (Baton); Petite suite (Chaminade). 7.15, Economic Notes. 7.30, Le Journal Parlé. 8.0, Concert by the Augmented Station Orchestra, conducted by Désiré Defaux. Soloist: Alfred Dubois (Violin). Variations on a Theme of Haydn (Brahms); Violin Concerto (Brahms); Marine (Hoeyens); Adagio for Strings (Lekeu); Fireworks (Stravinsky). In an interval at 8.45, Humorous Anecdotes. 10.0, Le Journal Parlé.

### BUCHAREST

761 kc/s, 394 metres; 12 kW.—2.0 p.m., Concert of Light Music and Romanian Music. 4.0, Concert by the Iordachescu Orchestra. In the interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Symphony Music. 6.40, Talk. 7.0, Concert of Polish Music by the Station Orchestra. 7.30, Talk. 7.45, Polish Song Recital by Mme. Dora Massini. 8.15, Concert of Polish Music (contd.). 8.45, Radio Journal.

### BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 7.0 p.m. till Close Down.—4.30 p.m., Pianoforte Recital by Maria Comensoli. 5.0, Talk. 5.30, Concert by the Budapest Concert Orchestra, conducted by Ferdinand Zsolt. 7.0, Humorous Dialogue. 8.15, Car and Carpenter—Opéra-Comique (Lortzing). Concert Version on Gramophone Records. 9.0, Weather. 9.20 (approx.), The Georg Guttenberg Jazz Band and the Lajos Veres Cigány Band from the Café Ostend; Soloist: Paul Kalmár.

CASSEL.—See Frankfurt.

### COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Katundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall. 11.15, Broadcast for Schools. 11.45, Concert by the A. Bendix String Ensemble, relayed from the Wivex Restaurant. 1.0, Interval. 2.0, Gramophone Concert of Variety Music. 2.30, Concert of Jazz Music. In an interval at 3.15 (approx.), Talk for Women. 4.30, Exchange and Fish Market Prices. 4.45, Talk. 5.15, French Lesson. 5.45, Weather. 5.54, Announcements. 6.0, News. 6.15, Time Signal. 6.30, Agricultural Talk. 7.0, Time Signal from the Town Hall. 7.2, Recital of Danish Songs by Aage Thygesen, with Introductory Talk by T. Wellejus. 7.45, Concert of Scandinavian Music by the Station Orchestra, conducted by Emil Reesen: Overture, The Maid of Orleans (Söderman); Incidental Music to Svanevit (Sibelius); Symphonic Rondo on Swedish Students' Songs (Westberg); Air with Variations and Bourrée from the Suite ancienne (Halvorsen); Prelude to Völund Smed (Ienriques). 9.30, Talk: The International Conference in Paris. 9.0, News. 9.15, Concert of Operetta Music by the Station Orchestra, conducted by Emil Reesen: Overture, Der Operball (Heuberger); Selection from Monsieur Beaucaire (Messager); Waltz from Die geschiedene Frau (Fall); Selection from The Rose of Stamboul (Fall); Two Melodies (Lehár); Overture, Der Göttergatte (Lehár). 10.0, Dance Music by the Jous Waryn Band, relayed from the Nimb Restaurant. In an interval at 11.0, Time Signal and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

### CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Talk. 6.20, Miscellaneous Announcements,

6.25, See Warsaw. 6.40, Programme Announcements. 6.45 to 9.10, See Warsaw. 9.10, Talk in Esperanto: Esperanto and the Blind. 9.25 till Close Down, See Warsaw. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

### FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C. 11.0 a.m., Happy Hour: Part I—Request Programme: Signature Tune; Harry Lauder Fantasy; Pale Volga Moon (O'Hagan); Daisy Bell (Dacre); Selection from Cavalcade (Coward); Bitter Sweet Waltz (Coward); Get away, Old Man (Crumbit); Songs made famous by Gus Glen; March, Stars and Stripes (Souza). Part II—Request Dance Programme: Alabama Song (Weill); Alice Blue Gown (Tierney); Put on Your Old Grey Bonnet (Weinrich); The Village Band (Fryburg); Tiger Rag (La Rocca); Brighter than the Sun (Noble); Rossa mia (Potter); In Santa Lucia (Strausky); Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0 p.m., Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Concert for Isle of Wight Listeners: Pianoforte Recital; Signature Tune, The Night by the Sea; Selection from Rigoletto (Verdi); Arabesque (Debussy); Song: Whither (Schubert); Sous les Palmiers (Albéniz); Liebesträume (Liszt); Song: By the Sea (Nebolt); Spanish Dance No. 5 (Granados); Prelude in C Sharp Minor (Rachmaninov). 5.30, Concert of Light Music for Portsmouth and Southsea: The Blue Bird (Bordin); Roll up the Carpet (Klages); Rhapsody in Blue (Gershwin); Lay your head on my Shoulder (Conrad); The Little Company (Spahn); Let me give my happiness to you (Posford); The Birth of the Blues (Henderson); The Enchanted Forest (Ganglberger); Signature Tune. 6.0, Programme in French. 10.0 (approx.) till Close Down, Programme in English by the I.B.C. 10.0 (approx.), Dance Music: Signature Tune, The Bells of Normandy; Shuffle off to Buffalo (Dubin); I shall still keep smiling along (Wallace); You'll never get to heaven that way (Lerner); I wake up smiling (Ahler); I've told every little star (Kerri); Under a blanket of Blue (Symes); Down in the Valley (Harrington); Sundown in a little Green Hollow (Whiting); Sweet dreams, pretty lady (Downey); Two Buck Tim from Tin-buctoo (Goodhart); Reflections in the Water (Loeb); Nobody's Sweetheart (Kahn); It was a Night in June (Gordon); My Gipsy Rhapsody (Lawrence); Avalon (Rose); It's Sunday down in Caroline (Symes); Signature Tune. 11.0, Tunes from the Talks: Signature Tune, Sitkin' in the Dark; Selection from Love me To-night; Love Songs of the Nile (Brown); Let the World go drifting by; I've found the right girl (Lupino); You are my heart's delight (Lehár); Happy Ending (Parr-Davies); To-day I feel so happy (Carter); Please (Robin); Signature Tune. 11.30, Club Concert for Wolverhampton Listeners: Part I—Gramophone Records: Signature Tune, The Chum Song; L'Entente Cordiale (Allier); Pianoforte Solo: Butterflies in the Rain; The Two Grenadiers (Schumann); A Radio Roundabout (arr. Noack); My Life is Love (Fraser-Simson); Many Happy Returns (de Bear); Veterans of Variety; My Darling (Heymann). 12.5 a.m. (Thursday), I.B.C. Late News Bulletin in English. 12.10 (approx.), Club Concert, Part III: Fiddlin' Joe (Cavanaugh); Honeysuckle Rose (Waller); My gal Sal (Dresser); Hoho, you can't ride this train (Armstrong); Heebie Jeebies (Tenbit); Signature Tune. 12.30, Dance Music by Jack Hylton and his Orchestra (Electrical Transcriptions): You're mine, you (Green); What a lady Josephine must have been (Pola); Hold Me (Schuster); Waltzing in a dream (Young); Out in the Open (Edgar); Pop Gun (Sarony); Dancing Butterfly (Young); It's the Band (Steinger). 1.0, Dance Music: Signature Tune, Bells of Normandy; My Lucky Day (Parr-Davies); Goodnight, but not Goodbye (Roberts); Happy Ending (Parr-Davies); I can't remember (Berlin); Twelfth Street Rag (Bowman); Down the Old Ox Road (Coslow); I raised my hat (Steinger); Learn to Croon (Coslow); My Bluebird's singing the Blues (Robin); Meet me in the gloaming (Goodhart); Thank Heaven for You (Rainger); Lover (Rodgers); Stay out of my dreams (Washington); Lazybones (Mercer); Sweetheart Darlin' (Kahn); Oh! Johanna (Lawrence); Signature Tune. 2.0, I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

### FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, 1,220 kc/s, 245.9 metres; and Trier, 1,157 kc/s, 259.3 metres.—11.0 a.m., Extracts from The Mastersingers (Wagner), on Gramophone Records. 12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35, Concert from Stuttgart. 1.30, See Langenberg. 2.30, Weather. 2.40, Time and Economic Notes. 3.0, Orchestral Concert. Soloist: Justus Ringelberg (Violin). 5.0, See Langenberg. 5.35, Topical Talk. 5.50, Weather and News. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Topical Talk. 7.10, See Stuttgart. 9.0, See Munich. 9.20, See Stutt-

gart. 9.30, Time and News. 9.40, See Langenberg. 11.0, Serenade from Stuttgart. 12 Midnight, Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

## HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., Concert by the Small Station Orchestra, conducted by Secker: Overture, Light Cavalry (Suppe); Scandinavian Suite (Frideriksen); Selection from The Merry Widow (Lehar); Ballet Suite (Popy). 4.0, Reading. 4.30, Topical Talk. 5.0, Talk: German Heroes (53). 5.20, Variety Programme. 5.40, Frankfurt Exchange and Market Prices. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0 (from Hanover), Military Band Concert. 8.10, Berend Jacob Karpfanger—Radio Sequence for the 250th Anniversary of his Death. 9.0, Time and News. 9.20, Concert by the Small Station Orchestra, conducted by Gerhard Maasz: Hymn (Puccini); Overture, Carneval in Rom (Strauss); Ballet Suite, The Source (Debussy); An der schönen, grünen Nareita (Komzak); Faun and Nymph (Königsberger); Selection from Where the Lark sings (Lehar); Three Dances for Pianoforte (Schubert); Aquarellen Walzer (Strauss); Two Old Dutch Dances (Heykens); Old Berlin Barrel Organ (Leuschner); March Potpourri, The Singing Battalions (Robrecht). **HANOVER.**—See Hamburg.

## HEILSBURG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert. In the intervals at 12.20 and at 1.0, News. 1.30, Programme arranged by the Post Office with Gramophone Records. 2.0, Exchange and Market Prices. 2.20, Hints for the Housewife. 2.30, Programme for Children. 3.0 (from Danzig), Concert by the State Theatre Orchestra, conducted by Lenzer: Overture, Indra (Flotow); Selection from Tieland (d'Albert); Norwegian Dances (Grieg); Overture, The Kiss (Smetana); Overture, Waldmeister (Strauss); Selection from The Daughter of the Regiment (Donizetti); Egyptian Suites, 1 and 3 (Proffes); Fantasia, Mozartiana (Kling). In the interval at 3.50 (approx.), Book Review. 4.45, Talk: Eugenies and its Significance for Family and Race. 5.15, Agricultural Prices. 5.20, The Art of Pianoforte Playing—Talk with Illustrations: Etudes, Op. 10 (Chopin). 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, Weather and News. 7.10, Dance Music by the Small Station Orchestra, conducted by Wileken, and the Börschel Dance Band. 8.45, Discussion: The National Movement and Physical Culture. 9.10, Weather, News and Sports Notes. 9.30, Concert Relay. 11.0 (approx.), Close Down.

## HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. (up to 5.40 p.m.) and 20 kW. (from 5.40 p.m.)—11.40 a.m. till Close Down, Programme of the Workers' Radio Society (V.A.R.A.). 11.40 a.m., Concert by De Filerelinters. 1.40 to 1.55 p.m., Interval. 1.55, Concert: Valse triste (Berger); Humoresque (Dvorak); Larghetto (Handel); Liebeslied (Kreiser); Zwei Märehenaugen (Kálmán); Espagnole (Moszkowsky); Volgalied (Lehar); Selection from Mariska (Lehar); Napoli (Mezzacapo); Melody (Leopold). 2.40, Programme for Children. 5.10, Orchestral Concert: Overture, Morning, Noon and Night (Suppe); Chanson villageoise (Marie); Jalousie (Gade); Czardas (Monti); Dance of the Dervishes (Bendix). 5.40, Organ Recital: Overture, The Barber of Seville (Rossini); Indian Love Call (Friml); Swinging in a Hammock (Wendling). 6.0, Concert (cont.): Waltz, Les Sirènes (Waldteufel); Berceuse from Jocelyn (Godard); Japanese Carnival (Basque); Aubade (Wailly); Selection from La Traviata (Verdi); Tempo-Tempo (Schootemeyer). 6.40, Talk. 7.0, Light Music by Les Chansonniers and Steyn (Accordion). 7.40, S.O.S. Messages. 7.42, Concert by the Station Philharmonic Orchestra, conducted by Prof. Ehrlich. Soloist: Joseph Schmidt (Tenor). Symphony in C. Op. 16, No. 3 (Boccherini); Old Italian Airs for Tenor and Orchestra; Symphony in D (Polaec). 8.25, News. 8.40 (Concert (cont.): Selection from Russian and Ludmilla (Glinka); Kamarinskaja (Glinka); Night on the Bare Mountain (Mussorgsky); Selection from Prince Igor (Borodin). 9.25, Dramatic Programme. 9.55, Concert (cont.): Popular Russian Songs for Tenor and Orchestra (Steinberg); The First Symphony (Schostakovitch). 10.45, Gramophone Music. 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm

OCT. 11th **WEDNESDAY** continued

## HUIZEN

160 kc/s, 1,875 metres; 7 kW. (until 3.40 p.m.). Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—Programme of the Christian Radio Society (N.C.R.V.). 10.40, Baritone Song Recital by Meyer: Du bist wie eine Blume (Schumann); Erstes Grün (Schumann); Du bist die Ruh' (Schubert); Das Geheimnis (Blume). Gramophone Music: Torna a Sorrento (de Curtis); Musica proibita (Gastaldon); Nog eenmaal jong en kind te zyn (van Amstel); Ous Vaderland (Hol); Jesu, allerliebtste kind (Amstel); Allerziele (Reckers); Moederziel alleen (Reckers). 11.40, Police Notes. 11.55, Gramophone Music. 12.10 p.m., Quintet Concert with Choral Interludes: Een liefde lot den Heiland (de Wolf); Song (Egberts); Hymn No. 198; N.C.R.V. Anthem; Flute and Piano Concerto in C (Friderick the Great); Naastenliefde (Brandts-Buys); De Herder (Worp); Beter te geven dan te ontvangen (van de Broeke). Gramophone Music: Selection from Sylvia (Delibes); La Carmine (Ganne); Suite (Popy); The Canary (Poliakini); Selection from Alessandro Stradella (Plotow). 1.40 to 2.10, Talk for Stamp Collectors. 2.40, Talk for Women. 3.10, Chamber Music: Mlle. Goossens (Cello); Degeller (Violin). Franken (Violin and Viola); and Brandes (Hornium). 4.40, Programme for Children. 5.40, Talk. 6.10, Programme to be announced. 6.40, Police Notes. 6.55, Religious News. 7.10, Talk. 7.40, Gramophone Music. 7.55, Concert by the Arnhem Orchestra, conducted by Jaap Spaanderman. Soloist: Madame van Bremen (Soprano). Overture, The Bartered Bride (Smetana). Soprano Solos: (a) Prayer from Werther (Massenet), (b) Aria from The Damnation of Faust (Berlioz); Ballet Music from Faust (Gounod); Viennese Rhapsody (Florent Schmitt). Soprano Solos: Arias from: (a) Aida (Verdi), (b) La Bohème (Puccini); Overture, The Barber of Seville (Rossini). In the interval at 8.40, Talk. 9.40, News. 9.50, Gramophone Music. 11.10 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

## LANGENBERG

635 kc/s, 473 metres; 60 kW.—11.0 a.m., Gramophone Concert from Frankfurt. 12.15 p.m., News from Frankfurt. 12.25, News and Weather. 12.35, Concert from Stuttgart. 1.30, Programme for Children. 2.30, Economic Notes. 2.50, Political Announcements. 3.0, Concert from Frankfurt. 5.0, German for Germans. 5.20, Talk: The Racial Question. 5.35, Reading (Frank). 5.50, News. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, See Frankfurt. 7.10 to 9.0, See Stuttgart. 9.0, See Munich. 9.20, See Stuttgart. 9.30, News, Weather and Sports Notes. 9.40, Light Music on Gramophone Records. 10.0, Dance Music, conducted by Kühn. 11.0, Serenade from Stuttgart. 12 Midnight, Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

## LEIPZIG

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m., Concert by the Halle Kampfbund Orchestra, conducted by Zschiesing. Selection from Stradella (Flotow); Jonathon Waltz (Müllacker); Selection from Der Obersteiger (Zeller); Two Character Pieces (Meyer-Helmund): (a) Rocco Serenade. (b) Wellenspiel; Quadrille from The Queen's Kerechief (Strauss); Selection from Die Irrfahrt uns (Gluck (Suppe); Waltz, So wie zu Hans (Delinger); Selection from Fra Diavola (Auber); Character Piece, Wedgwood China (Kotelybey); Operetta Potpourri (Fetras); March (Dreyer). In the interval at 12.15 p.m., News and Programme Announcements. 1.0, News. 1.30, Talk for Motorists. 2.0, Talk: The Reorganisation of the Peasant Class in Thuringia. 2.15, Reading: Nationalism and Democracy in the France of the Third Republic (Walter Frank). 2.35, Economic Notes and Market Prices. 3.0, Variety Programme. Part I. Brave Boys and Girls—Radio Sequence (Roth). Part 2. Folk Songs and Children's Songs on the Accordion. Part 3. An Autumn Day—Songs by a Girl's Choir. 4.50, Economic Notes, Weather and Times. 5.0, Mozart Violin and Pianoforte Sonatas, played by Fritz Heing and Theodor Blumer. Sonata in F for Violin and Pianoforte, Pianoforte Sonata in C; Sonata in E flat for Violin and Pianoforte. 5.50, Review of the Day's Events. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Concert by the Ende Orchestra. 8.0, Egerland Programme. 9.0, News. 10.0, Dance Music by the Emdé Orchestra. 11.0 (approx.), Close Down.

**LINZ.**—See Vienna.

## LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Talk on Religion. 6.30, Literary Talk. 7.0, Opera Relay. In the interval at 8.30, Weather and News. 9.30 to 10.0, Programme in English by the I.B.C. Concert: For you, Rio Rita; Sweet Amanda; Play Fiddle, play; I'll never have to dream again; Silver Hair and Heart of Gold; The Oi Song; Someone to Care for; This is no Dream. 10.0 (approx.), Close Down.

## LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—Luxembourg Evening. 7.30 p.m., Violin Concert in D, Op. 61 (Beethoven) by Kreisler and the Berlin State Opera Orchestra, conducted by Leo Blech (Gramophone Records). 8.20, Bass Song Recital by Victor Jaans: Aria from Boris Godunov (Mussorgsky); Song of the Volga Boatmen (Kolemei-Chaliapin); Aria from The Tales of Hoffmann (Offenbach); The Two Grenadiers (Schumann). 8.50, News in French. 9.0, Concert by the Station Orchestra, conducted by Henri Pensis: Two Pieces (Foes); (a) Serenade for Cello and Pianoforte, (b) Elegy for Violin and Pianoforte; Hindu Sketch, Vivanitra et Menaka, for Flute, Saxophone, English Horn and Pianoforte (Kowalsky); Show Waltz, Lore-Lore (Koster); Onstep, Oh, Marieche löss dech Zössen (Albrecht). 9.30, Concert by the Station Orchestra, conducted by Henri Pensis: Carnival Overture (Glanzov); Hungarian Rhapsody No. 2 (Liszt); Flirtations (Stek); Potpourri, Servus Wien (Dostal). In the interval at 9.50, News in German. 10.25, Dance Music on Gramophone Records.

## LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.30 p.m., Radio (Gazette) for Lyons and the South-East. 8.30, Two Plays (de Musset): (a) On ne badine pas avec l'amour, (b) Le caprice. After the Programme: News.

## MADRID

ARANJUEZ (EAQ), 9,860 kc/s, 30.43 metres; 20 kW. 10.30 p.m., Concert of Spanish Music. In the interval at 10.45, Radio Chronicle. 11.40, Light Music. 12 Midnight, Concert arranged by the International Broadcasting Company (Ireland), Ltd. on behalf of Hospitals' Trust, Ltd.: Signature Tune, Come back to Erin; Butterflies in the Rain; On a little Street in Honolulu; The Russian Princess; Kissing is no Sin; The Skaters' Waltz; Soft Lights and sweet Music; A Penny for your Thoughts; There's a House on a Hill; Signature Tune, Come back to Erin. 12.30 a.m. (Thursday), I.B.C. Good-night Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

## MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Plichta. 3.50, See Prague. 4.35, Gramophone Music. 4.45, See Prague. 4.55, Talk on Weaving. 5.5, Reading. 5.15, See Prague. 5.25, Concert by a Peasant Orchestra. 6.0, See Prague. 6.10, Talk: Vivisection. 6.25, Choral Concert. 6.55, See Prague. 9.15 (approx.), Close Down.

## MOSCOW

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather. 1.45 p.m., Weather Forecast. 2.0, Concert with Talk. 3.0, Wireless Talk. 3.30, Golden Childhood—Play (Schatunovsky, after Glaeser's Book, (Class 1902), with Music by Kobalecky. 4.30, Concert by the Neapolitan Orchestra. Part I: Italian Music. Part II: Russian Music. 5.30, Programme of Cigany Music and Hungarian Songs and Dances. 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

## MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30, See Leipzig. 4.45 (from Nürnberg). Talk: German Soldiers in North America. 5.5, Spanish Guitar Recital by Miguel Llobet. 5.25 (from Nürnberg). Talk on Mountaineering. 5.45, Time and Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Variety Programme. Part I. Concert by the Small Station Orchestra, conducted by Erich Kloss, and Soloists. Part II. Answers to Correspondents and Unpractical Advice for Everybody. Part III. The Garden—Radio Puzzle (Hanns Knan), with Music by the Reithemer Orchestra. 9.0, Austria. 9.20, Time and News. 10.0, Concert, relayed from Hamburg. 11.0 (approx.), Close Down.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

## OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Gramophone Concert. 5.0, French Lesson. 5.30, Programme for Boys. 6.0, News. 6.30, Talk. 7.0, Time Signal. 7.2, Concert by the Station Orchestra, conducted by Hugo Kramm. Soloist: Soffi Schöning (Songs). Overture, William Tell (Rossini); Songs: (a) Aria from Don Giovanni (Mozart); (b) Aria from Figaro (Mozart); Overture and Aria from Der Freischütz (Weber); Aria from La Traviata (Verdi); Prayer and Temple Dance from Sigurd Jorsalfar (Grieg). 8.0, Political Talk by the President of the Workers' Party. 8.20, Gramophone Music. 8.30, Agricultural Report and News. 9.0, Topical Talk. 9.15, Choral Concert, conducted by Hellberg. 9.45 (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

## PALERMO

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopplavoro Announcements, Tourist Talk, Agricultural Report, and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Variety Concert: Soloists, Diamante (Flute) and Mazzotti (Tenor); Suite from The Tale of the Tsar Saltan (Rimsky-Korsakov); Flute Solo, Four Medieval Dances (Lauer); Andante (Gemini-Marinuzzi). Talk. Tenor Solos: (a) Tormento (Tosti); (b) Siciliana (Mazzotti); Invitation to the Waltz (Weber); Flute Solos: (a) The Nightingale (Conperin), (b) Gigue (Zipoli); Tenor Solos: (a) Tristezza (Tosti), (b) Colombo bianco (Manno); Overture, Joan of Arc (Verdi). After the Concert, Light Music. 10.0, Giornale Radio.

## PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Falla Music on Gramophone Records. 7.15, Le Journal Parlé. 7.30, Sponsored Concert. 8.0, Social Assurance Societies' Reports. 8.5, Wireless Technical Talk. 8.35, L'Invitation au voyage—Play (Bernard). 10.30, Dance Music relayed from the Lido. 11.0, News.

## PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m., Weather and Physical Culture. 7.45, Gramophone Records: Blaze away (Holzmann); L'Horizon d'or (Defrance); Rallye Perchois (Richard-Rossignon); Colonel Bogey (Alford). 8.0, Weather and News. 12.0 Noon, Educational Talk. 12.15 p.m., Gramophone Music: Melody (Aleksandrov); Irish Airs (Greenbaum); Sospiro (Coppola); Potpourri of Popular Melodies: Le Mariage du Coucou (Dalcroze). 12.30, Organ Recital, relayed from the Gaiumont Palace: Viendrez-vous prendre le thé (Rayel); Selection from Comtesse Maritza (Kálmán); Santa Lucia (Mario); Ce sera vous (Young). 1.0, Exchange, News and Weather. 1.5, Gramophone Concert of Offenbach Music: Selection from La Vie Parisienne; Overture, Orphans in the Underworld; Selection from Les Braconniers; Rondo from Madame Favart; Le plus gentil des trois from Madame l'Archiduc; Selection from La belle Hélène; La lettre, from La Perichole; Four Airs from Les Brigands. In the interval at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.50, Gramophone Music. 7.0, Medical Talk. 7.20, Concert by the Maey Orchestra. 7.50, Commercial Prices and News. 8.0, Readings. 8.30, News and Weather. 8.40, Fashion Review. 8.45, Pianoforte Recital by Jean Doyen: The Harmonious Blacksmith (Handel); Rondo (Mozart); Rondo Capriccioso (Mendelssohn); Au Bord d'une Source (Liszt); Scherzo No. 3 (Chopin). 9.15, Press Review and News. 9.30, Gramophone Concert: Extracts from El Amor Brujo (Fallá); Two Arias from Les Troyens à Carthage (Berlioz); Escapes (Dert); Le Bestiaire (Poulenc); Four Suites for Wind Instruments from Die Dreigroschenoper (Weill).

## PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by WBXK on 48.86 metres and 25.27 metres.—8.0 p.m., Programme to be announced. 8.15, Utility Hall, from New York. 8.30, Popular Programme. 8.35, Dixie Days, from New York. 9.0, Betty and Bob, from New York. 9.30, Frances Ingram. 9.45, News and Markets. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, The Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News, Talk. 11.15, Sports. A Song. 11.30, Pittsburgh Spotlights. 11.45, Lowell Thomas, from New York. 12 Midnight, Amos 'n' Andy, from New York. 12.15 a.m. (Thursday), Programme to be announced. 12.30, Richard Himber's Orchestra. 1.0 to 2.0, New York Relay. 1.0, Crime Clues. 1.30, Potash and Perlmutter. 1.45, Red Davis. 2.0, 20,000 Years in Sing Sing. 2.30, John McCormick and Orchestra. 3.30, Around the Cracker Barrel.

**PORSGRUND.**—See Oslo.

OCT. 11th WEDNESDAY continued

PRAGUE

614 kc s, 488.6 metres; 120 kW. 3.0 p.m., See Moravská-Ostrava. 3.50, A Puppet Play. 4.35, Gramophone Music. 4.45, Reading. 4.55, Gramophone Music. 5.5, Agricultural Talk. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission. Talk: Modern Prison Life, followed by Talk for Women. 6.0, Time and News. 6.10, See Moravská-Ostrava. 6.25, Variety Programme. 6.55, Gramophone Music. 7.0, Napoleon—Play in Five Acts with a Prologue (André Lord and Jean Marsch), translated and adapted for Radio by Cvanera. Interludes of Music of the Period. In the interval at 8.0, Time Signal. 9.0, Time and News. 9.15, Foreign News in French. 9.30 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc s, 403 metres; 25 kW.; and Geneva, 395 kc s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Operetta Music on Gramophone Records. 12 Noon (from Lausanne), Financial News. 12.10 p.m. (from Lausanne), Gramophone Concert. Part I—Popular Melodies; Part II—Extracts from Pictures from an Exhibition (Mussorgsky); Part III—Classical Music. 1.0 to 2.28, Interval. 2.28, Time Signal from Neuchâtel Observatory. 2.30 (from Geneva), Gramophone Music. 4.0 to 5.0, Interval. 5.0 (from Geneva), Programme for Children, relayed from the Kursaal. 6.0 (from Lausanne), Reading from The History of Switzerland (Maxime Reymond). 6.25 (from Lausanne), Agricultural Report, News and Weather. 6.30 (from Lausanne), Talk: The Autumn Ball Show. 7.0, Concert by the Radio-Suisse Romande Orchestra, conducted by Echenard. Soloist: Paul Goldschmidt (Pianoforte). Overture. The Bartered Bride (Smetana); Serenade in C Minor for Wind Instruments (Mozart); Pianoforte Concerto in C Minor, Op. 37 (Beethoven); Serenade for Orchestra (Schoeck); March from Le Convent sur Feu (Casella). 8.20 (from Lausanne), Music by the Lyrette de Montreux. 8.50, News and Weather. 9.0 (from Geneva), Talk: The Work of the League of Nations. 9.15 (from Lausanne), Dance Music. 10.0 (approx.), Close Down.

REYK JAVIK

250 kc s, 1,200 metres; 21 kW.—8.5 p.m., Musical Programme. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, Chimes. 9.2, News. 9.30, Reading. 10.0, Carmen Opera (Bizet).

TRJUKAN.—See Oslo.

ROME

Call 1RO, 680 kc s, 441 metres; 50 kW. Relay by Naples, 941 kc s, 319 metres; Milan (Vigentino), 662 kc s, 453.2 metres, from 7.45 p.m., and 2RO, 11,810, kc s, 25.4 metres, from 4.15 p.m. 11.30 a.m., Gramophone Music. 12 Noon, Orchestral Concert of Light Music. 1.0 p.m., Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio, Exchange, and Report of the Royal Geographical Society. 4.10, Weather. 4.15 to 5.0, Orchestral Concert. 5.40 (Naples), Shipping and Sports Notes. 5.45, Popolavoro Report and Tourist Notes. 5.47, Report of the International Institute of Agriculture (in Italian and English). 6.10, Grain Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time, Announcements, and Gramophone Music. 7.15, Medical Talk. 7.30, Giornale Radio and Sports Notes. 7.45, Variety Concert; Soloist, Margherita Cossa (Soprano); Mandoline Quartet: (a) Aria with Variations (Martini), (b) Canzonetta from the Quartet, Op. 12 (Mendelssohn); Four Songs (Brahms); (c) An die Nachtigall, (d) Liebeslied, (e) Wiegenlied, (f) Sonntag; Mandoline Quartet: (a) Minuet (Lulli), (b) Gigue (Vivaldi), (c) Allegro con spirito (Scarlatti). 8.30, The Poet—Comedy in One Act (Nicolodi). 9.0 (approx.), Song Recital by Emilio Livi (Tenor): Bimba, bim-betta (Sibella); Aria from L'Amico Fritz (Mascagni); Aria from L'Arlesienne (Cilea); Theatre Notes, followed by Dance Music after the Programme. 10.0, Giornale Radio.

SALZBURG.—See Vienna.

SCHENECTADY

WCY, 790 kc s, 379.5 metres; 50 kW. Relay by intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—7.30 p.m., Two Seats in the Balcony, from New York. 8.0 to 8.30 (approx.), Grande Trio, from New York. 12.45 a.m. (Thursday), Stock Reports. 1.0 to 2.30, New York Relay. 1.0, Popular Programme. 1.30, Variety Programme. 2.0, Musical Programme. 2.30, Popular Programme. 3.0, Variety Programme, relayed from New York. 3.30, Ship of Joy, from New York, followed by Programme Réssumé.

SCHWEIZERISCHER LANDESENDER

BEROMUNSTER, 653 kc s, 459 metres; 60 kW.; Basle, 1,229 kc s, 244.1 metres; and Berne, 1,220 kc s, 245.9 metres. 5.50 a.m. to 6.5 (from Berne), Gymnastics. 10.59, Time Signal from Neuchâtel Observatory. 11.0 (from Berne), Gramophone Concert. 11.30, Time, Weather, and

News. 11.40 (from Berne), Gramophone Concert. 12.25 p.m. (from Berne), Time, Weather and Exchange. 12.30 (approx.) to 4.0, Interval. 4.0 (from Berne), Programme for Children. 4.30 (from Berne), Gramophone Music. 5.30 (from Zürich), Talk: In the Miniature Republic of Andorra. 6.0 (from Zürich), Time, Weather, and Market Prices. 6.10 (from Zürich), Elementary English Lesson. 6.45 (from Berne), Introductory Talk to the following transmission. 7.0 (from Berne), Così fan Tutte—Opera in Two Acts (Mozart), relayed from the Municipal Theatre. In the interval at 8.25, Weather and News. 10.0 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

STOCKHOLM

689 kc s, 436 metres; 55 kW. Relay by Boden, 244 kc s, 1,229.5 metres; Göteborg, 932 kc s, 322 metres; Hörby, 1,166 kc s, 257 metres; Motala, 221.5 kc s, 1,354.4 metres; Östersund, 389 kc s, 770 metres; and Sundsvall, 554 kc s, 542 metres.—12 Noon to 12.30 p.m., Broadcast for Schools. 4.5, Songs and Music by a Mandoline Orchestra. 4.45, Gramophone Music. 5.45, Talk. 6.15, Weather and News. 6.30, Talk on Alexis Kivi, a Famous Finnish Author. 7.0, Creditors' Play (August Strindberg). 8.0 (from Göteborg), Symphony No. 1 in B flat Op. 60 (Beethoven). 8.45, Weather and News. 9.0, Dance Music, relayed from the Bern Hall. 10.0 (approx.), Close Down.

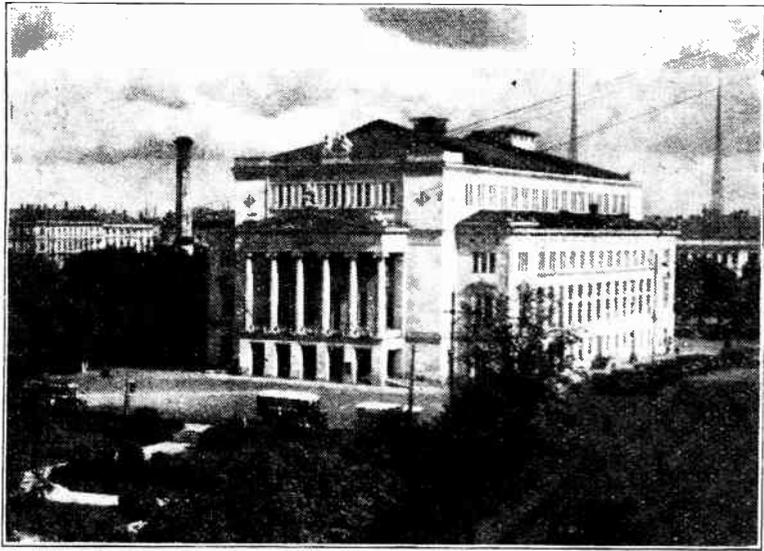
STRASBOURG

869 kc s, 345 metres; 11.5 kW.—11.30 a.m., Classical Music on Gramophone Records. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Light Music on Gramophone Records. 2.0, Interval. 4.45, Talk in German: Electricity—Modern Lighting Methods. 5.0, Orchestral Concert, conducted by Roskam: One Step, La chanson du canard (Ritter); Waltz, Scheiden und meiden (Fetras); All mein Glück liegt nur in Deinen Händen (Profes); Selection from Le chemin du Paradis (Heymann); Cello Solo; Serenade

metres.—11.0 a.m., See Frankfurt. 12.25 p.m., News and Programme Announcements. 12.35, Concert by the Station Orchestra, conducted by Gustav Gürlich. Overture, Der Haideschaft (Holstein); Clog Dance from Czar and Carpenter (Lorzing); Selection from Ariadne auf Naxos (Richard Strauss); Two Swedish Folk Melodies (Svend-See); Waltz, Morgendämmer (Strauss). 1.30, See Langenberg. 2.30, Old and New Dances on Gramophone Records. 3.0, See Frankfurt. 5.0, See Langenberg. 5.35, Talk in connection with the Building Exhibition at the Kochhof. 5.50, Time and Market Prices. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, See Frankfurt. 7.10, Symphony Concert from the Lieberhalle. The Station Orchestra, conducted by Ferdinand Brast, with Max Paur (Pianoforte); Overture, Rosamund (Schubert); Concerto in G for Pianoforte and Orchestra, Op. 56, No. 1 (Beethoven). 7.50, Love the Magician—Fantastic Play after Calderon with Music by Georg Fuchs. 9.0, See Munich. 9.20, Talk: You must know... 9.30, See Frankfurt. 9.45, Local News. 10.0, See Langenberg. 11.0, Serenade. 12 Midnight (approx.), Close Down. SUNDSVALL.—See Stockholm.

TOULOUSE

RADIOPHONIE DU MIDI, 799 kc s, 385 metres; 8 kW.—6.0 p.m., News. 6.45, Hawaiian Guitar Music. 6.30, Operetta Music. 6.45, Argentine Music. 6.50, Sponsored Talk. 7.15, News, Racing Results and Commercial Prices. 7.30, Orchestral Extracts from Countess Maritza—Operetta (Kálmán). 7.45, Songs. 8.0, Opéra Comique Music: Air from Si j'étais roi (Adam); Aria from Madame Butterfly (Puccini); Mimi's Aria from La Bohème (Puccini); Melody from Tosca (Puccini). 8.15, Military Music. 8.30, Opera Music: Air from Sigurd (Reyer); Melody from The Tales of Hoffmann (Offenbach); Air from Faust (Gounod); Lohengrin's Narration from Lohengrin (Wagner); Boris' Aria from Boris Godunov (Mussorgsky); Death



The imposing Lethvian Opera House at Riga, from which frequent relays are broadcast. The aerial masts of the Riga broadcasting station can be seen in the background.

(Braga); Foxtrot, Good Evening, Mister Nightingale (Pollack-Seymour); Boston, I can't remember (Berlin); Chant sans paroles (Tchaikovsky); Foxtrot, Stay out of my Dreams (Washington-Peterson); Valse Musette, La Java de minuit (Aekermann); Tango, Adieu (Onchita (Ursman); You'll never get up to Heaven that Way (Lerner and Baer); March, Oh! les gosses! (Sylviano). 6.0, Trio Concert, relayed from Lille, 1,130 kc s, 265.4 metres. 7.0, Legal Talk. 7.15, Talk on the Skilled Trades. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, See Lyon-la-Doua. After the Programme, Press Review. 10.30, Orchestral Concert, conducted by Jeanine, relayed from the Grand Kléber Tavern; March, El Capitán (Sousa); Waltz, Winterstürme (Fuchs); Suite No. 2 from L'Arlesienne (Bizet); The Musical Box (Blauw); Selection from La Mascotte (Andran); Vibration Solo, Melody (Dostal); March, Populairité (Savasta). 11.30 (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc s, 360.5 metres; 60 kW. Relay by Freiburg, 527 kc s, 570

of Don Quixote from Don Quixote (Massenet). 9.0, Concert by the Philharmonic Orchestra, conducted by Arnae; March, Condé (Wetzel); Overture, Le Village voisin (Boieldieu); Intermezzo and Minuet from L'Arlesienne (Bizet); Waltz (Poppy); Hungarian Dances Nos. 5 and 6 (Brahms); March, Mimi Pinson (Copeland). After the Concert, Accordion Music. 10.15, North African News. 10.30, Programme for Listeners in Morocco, Concert by a Viennese Orchestra, followed by Sound Film Music. 11.0, Request Concert. 11.15, Dance Music. 12 Midnight, News, Weather and Announcements. 12.5 a.m. (Thursday), Chansonnettes. 12.15, Orchestral Music. 12 (approx.), Close Down.

TRIESTE

1,211 kc s, 247.7 metres; 10 kW.—4.10 p.m., Violin and Pianoforte Recital by Nives Franck and Ilse Matisek; Violin Solo; Follia (Corelli-Kreisler); Pianoforte Solos: (a) Festa campestre (Zanella), (b) Presto and Adagio from the Romantic Suite, No. 6 (Loango); Violin Solos: (a) Adios a la Alhambra (Montaerio y Agüero), (b) Spanish Serenade (Chaminade-Kreisler); Pianoforte Solos: (a) Russian Village Scene (Tchaikovsky)

sky). (b) Hungarian Rhapsody (Liszt) 5.0 till Close Down.—See Turin.

TRONDHEIM.—See Oslo.

TURIN

1,096 kc s, 273.7 metres; 7 kW. Relay by Milan, 905 kc s, 331.5 metres; Genoa, 959 kc s, 312.8 metres, and Florence, 399 kc s, 500.8 metres. 4.15 p.m., Song Recital by Clara Triacri Annone (Soprano) and Attilio Barbieri (Tenor). 5.0 to 5.5, Weather. 5.45, Giornale Radio, Popolavoro Announcements and Gramophone Music. 6.0, Time, Tourist Talk and Gramophone Music. 6.10, Agricultural and Market Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio and Weather. 7.15, Medical Talk. 7.30, A Comedy in Three Acts. After the Comedy, Dance Music. 10.0, Giornale Radio.

VATICAN CITY

15,120 kc s, 19.84 metres (Morning), and 5,969 kc s, 50.26 metres (Evening); 10 kW.—11.0 to 11.15 a.m., Religious Information in Spanish. 8.0 to 8.15 p.m., Religious Information in Italian.

VIENNA

581 kc s, 517 metres; 100 kW. Relay by Graz, 852 kc s, 352.1 metres; Innsbruck, 1,058 kc s, 283 metres; Klagenfurt, 662 kc s, 453.2 metres; Linz, 1,220 kc s, 245.9 metres, and Salzburg, 1,373 kc s, 218.5 metres.—11.0 a.m., Concert by the Wiener Symphoniker, conducted by Holzer: Overture, Mignon (Thomas); Valse Cyrano (Makomaski); Tanzliedchen (Keldorfer); Extract from Der Evaugeliemann (Kienzl); Italian Serenade (Wolf); Waltz, Roses from the South (Strauss); Selection from The Man with Three Wives (Lohar); March Song, Dagobert (Ascher); Viennese Song (Eysler); Bayerolle (Glickh); Polka (Kremsler); Waltz (Frdt); Serenade (Kulno); Potpourri, From A to Z (Geiger). In the interval at 12 Noon, Time, Weather and Announcements. 1.0 p.m., Interval. 2.0, Time, Weather and Exchange. 2.20, Talk: Alcoholic Drinks. 2.30, Talk: The Tragedies of Shakespeare. 2.55, Gramophone Records of Viennese Operetta Music. 3.30, Sonata for Violin and Pianoforte (Schubert). 3.55, Educational Talk: Kindergartens. 4.25, Contemporary Austrian Composers Friedrich Reidinger Concert by the Sedlak-Winkler Quartet and Hella Schrott (Soprano); Violin and Pianoforte Sonata in D, Op. 11; Four Songs; String Quartet in B Flat minor in One Movement, Op. 12. 5.10, Talk: Unfounded Fears of Heart Patients. 5.35, Talk: Stenography. 6.0, Concert by the Wiener Symphoniker, conducted by Niras: Sonata con Aria (Schmelzer); Suite of Variations (Peters); Extracts from The Florilegium secundum (Muffat); Overture to a suite (Fux); Serzizio di tavola (Reutter); Minuet (Abrecht-Schberger); Turkish March (M. Haydn); Minuet (Haydn); German Dance (Mozart); Minuet and Contredanse (Beethoven); Minuet, Ländler and Waltz (Schubert); Old Viennese Dance; Styrian Dances (Lammer); Polka-Mazurka, Frauenber (Jos. Strauss); Waltz, New Vienna (Strauss). In the interval at 6.35, Time and Exchange. 7.30, Two One-Act Plays (Bernard Shaw), German Translation by Tschitsch; (a) The Dark Lady of the Sonnets, (b) Overland. 8.45, News, Weather and Exchange. 9.0, Dance Music from the Palmhof Café. After the Programme, Announcements.

WILNO

533 kc s, 563 metres; 16 kW.—6.20 p.m., Miscellaneous Items. 6.25, See Warsaw. 6.30, Programme Announcements. 7.0, See Warsaw. 9.10, Esperanto Talk, relayed from Cracow, 950 kc s, 315 metres. 9.25 till Close Down. See Warsaw.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Dance Music on Gramophone Records. 11.30, Radio Journal and Weather. 11.35, Extracts from Cavalleria rusticana (Mascagni) on Gramophone Records. 12 Noon, Interval. 2.30, Talk on Economics. 2.40, Schubert Song Recital (Gramophone Records). 3.10, Marie Konopnicka Literary and Musical Programme. 3.40, Literary Talk. 3.55, Musical Programme relayed from Lwów, 788 kc s, 381 metres. 4.25, Soprano Song Recital by Marie Kaupke—Songs (Rachmaninov): (a) Los Iilas, (b) Je Fai aimé; Song (Hugo Wolf); (c) Einsamkeit, (d) Verschwiegene Liebe; Air from L'enfant prodigne (Debussy); Aria from The Barber of Seville (Rossini). 4.50, Agricultural Talk. 5.0, Talk: Psychic Phenomena. 5.20, Light Music relayed from the Café Adria. 6.5, Announcements. 6.25, Reading (Wasniewski). 6.40, Programme Announcements. 6.46, Radio Journal. 7.0, Old Melodies. 8.0, Reading. 8.15, Violin Recital by Irene Dubiska; Sonata (Civald-Raspigli); Largo and Allegro (Veracini); Gavotte (P. E. Bach); Rondo in G (Mozart); Concert Piece (Saint Saëns); Berceuse (Zarebski); Melody (Zarzycki). 9.0, Sports Notes. 9.10, Esperanto Talk, relayed from Cracow, 950 kc/s, 315 metres. 9.25, Dance Music. 10.0, Weather and Police Notes. 10.5, Dance Music. 10.30 (approx.), Close Down. ZURICH.—See Schweizerischer Landessender.

## ALGIERS

824 kc/s, 364 metres; 13 kW.—12.30 p.m., Gramophone Concert of Variety Music: Carn (Brusselmann); Waltz, Nuits parisiennes (Scassola); Serenade romantique (Scassola); Potpourri, Souvenirs de Johann Strauss (arr. Schlogel); Selection from The Secret Marriage (Ginarosa). 1.0, News Bulletin. 1.5, Gramophone Concert (cont'd.). Granada catalana (Albeniz); Two Spanish Dances (Nozskowsky); Serenade (Toselli); Serenade (Heykens); Les songes d'Azide (Solabert); Les Ombelles (Solabert); Les noces de Madelon (Bertolys). 6.30, Programme for Children: Henri n'est pas egoiste (Capus); Les deux chevres (Capus); Le roti Crute (Quinet and Montgon). 7.0, Exchange and Market Prices. 7.30, Shippings Notes. 7.45, Agricultural Notes and Weather Report. 7.50, Dance Music with vocal refrains: Fox-trot, Quand une Petite Femme (Dinfus); Waltz, Dans les Musettes de Paris (Cahus); Tango, Ah pourquoi mens-tu? (Lunoir); One-step, Ca vient de Paris (Selling); Java, Dans ma cabane (Dufus); Fox-trot, Le pousse de carton (Nacio); Tango, Melancolia (Platerotti); Fox-trot, Les Talipes blanches (Burke); One-step, Oh, La! La! Papa, Mama! (De Buxemil). 7.55, News. 8.0, Time Signal. 8.2, Lottery Results. 8.10, Music by a Gigan Band. 8.45, News. 8.50, Interlude. 9.5, Request Gramophone Records. 9.30, News. 9.35, Military Music. 9.55, News. 10.0, Eastern Music.

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time, Weather, Stock Report, and Gramophone Concert. 6.0, Programme for Children. 6.40, News. 7.0, French Lesson. 7.15, Miss Irene Haugh in a Recital of her own Poems. 7.30, Time Signal. 7.31, Orchestral Concert of Symphony Music, conducted by Godfrey Brown: Overture, Le roi l'a dit (Delibes); Symphony No. 2 in B Minor (Borodin); Song Selections; Romanian Rhapsody No. 2 in D (Enesco); Two Minuets and Farandole from L'Arlesienne (Bizet); Dance of the Tumblers (Rimsky-Korsakov); Song Selections; Scenes Napolitaines (Massenet). 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Dance Music: How are you?; Lullaby of the Leaves; Let's all dance the Polka; Where are you now?; "Wireless World" Announcement; Sarita Tango; Big Ben's saying Goodnight; Mary; We're all alone. 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of Hospitals' Trust, Ltd.: The Red Sarafan (Leontiev); Ballet Air, Caprice (Andrayv); Song of the Volga Boatman (Traditional); Racing Commentary; By the Riverside (Leontiev); Russian Folk Song and Dance (Traditional); Le reve (Andrayv); Waltz Impromptu (Andrayv). 10.30, I.B.C. Goodnight Melody, followed by News and Weather. 10.40, Traditional Music. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert. In the interval, Talk. 7.0, Request Gramophone Concert. 7.30, Exchange and Gramophone Concert (cont'd.). 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange, and Market Prices. 9.5, Concert by the Station Orchestra: Military March (Jaques-Dalcroze); Selection from La gitana blanca (Jimenez-Vives); Waltz, Rio Rita (Tierney); Dance (Finck); Sarabande (Saint-Saens); Overture (Rust). 10.0, El niño de las coles—Comedy in Three Acts (Capella and Lucio). In the interval at 11.0, News. 12 Midnight (approx.), Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—11.30 a.m., Quintet Concert. 12.5 p.m. (approx.) to 3.30, See Rome. 3.30, Programme for Women. 3.50 (approx.) to 5.35, See Rome. 5.35, News in Albanian. 5.45 (approx.) to 6.20, See Rome. 6.20, News in Albanian. 6.40 (approx.) till Close Down, See Rome.

BASME.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—5.55 p.m., Time and Programme Announcements. 6.0, Song Recital by Dragi Petrovici; Songs: (Tosti); (a) Souvenir; (b) Serenade; (c) Sogno; Song (Hatz); Serenade (Hatz). 6.30, Talk. 7.0, Verdi Concert; Part I: Quartet Music; Part II: Songs; Part III: Orchestral Music. 9.10, Time and News, followed by Dance Music on Gramophone Records.

## BERLIN

DEUTSCHLANDSENDER (Reichsender), 183.5 kc/s, 1,635 metres; 60 kW.—1.0 p.m., Gramophone Concert: Holzendorff-Marsch (Blume); Der Vögeln Abendlied (Derksen); Circassian Tattoo (Macht); Rosentango (Schreier); Im Prater blühen wieder die Bäume (Stolz); In the Temple of the Bells (Yoshitomo); Selection from The Merry Widow (Lehár); Song of the Volga Boatman (Glanzov); Das Wandern ist des Müllers Lust; Wie reizend sind die Frauen (Reutter); Twenty Years later (Reutter); March, My Austria (Preis). 2.0, Programme for Young People. 2.30, Weather and Exchange. 2.45, Reading. 3.0, See Heilsberg. 4.0, Talk for Women: The Life of Francis Rockefeller. 4.20, Concert of Contemporary Music; Paul Eggert (Piauforte)

and Rolf Ghatberg (Monologues); Three Pianoforte Pieces—Fresken (Max Anton); Musikalische Versnovellen (Hans Sobanski); (a) Bienenlegende, (b) Die Kater-Rhe. 5.0, Poems. 5.5, Manfred Ludwig Lommel Programme. 5.50, Rural Programme. 5.50, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, To-day's Motto. 7.5, Light Music. 7.30, Der Schimmelreiter—a Radio Play after the Story by Theodor Storm (Martin Rasika). 9.0, News, followed by Dialogue: Aircraft and Transatlantic Traffic. 9.45, Weather. 10.0, Concert from the Nationale Gaststätte. 11.30 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—3.20 p.m., Chamber Music. The Wind Instrument Society of the Municipal Opera House. Adagio and Theme with Variations from the Trio in G for Pianoforte, Flute and Bassoon (Beethoven); Romance from the Horn Concerto (Mozart); Romance for Oboe and Pianoforte, Op. 94 (Schumann); Pieces from the Hansmähren for Pianoforte (Joseph Haas); Scherzo for Clarinet and Pianoforte (Laurischkus); Gavotte and Tarantella for Pianoforte, Flute, Oboe, Clarinet, Horn and Bassoon (Führmeister). 4.30, Reading of Modern Lyrics. 4.50, Talk by Joseph Wittig; Little Joys. 5.10, Paul Graener Song Recital by Margarete Corazolla (Soprano): Two Songs (Wilhelm Raabe); (a) Ein Brieflein, (b) Folk Song: Three Songs from Goethe; (a) Blumengruss, (b) Nachtgedanken, (c) Behandelt die Frauen mit Nachsicht; An den Mond (Dehmel); Das bittersüsse Lied, and Winter (Hermann Löns). 5.30, Funkstunde informs its Listeners. . . 5.35, A Call from Magdeburg. 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, Lottery Announcements. 7.5 to 11.0, Dance Music—for Orchestra, Dance Band and Choir. Soloist: Max Mensing (Tenor). In the interval at 9.0, News, and at 10.0, Announcements. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.40, Talk. 7.55, Lottery Results. 8.0, Talk on Wines. 8.15, News. 8.30, L'apassionata—Play in Four Acts (Froindie).

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.50 p.m., Opera Aria Recital by Jana Kamasová (Contralto): Aria from Il Trovatore (Verdi); Aria from A Masked Ball (Verdi); Two Arias from Samson and Delilah (Saint-Saens); Aria (Sasek). 5.25, Violin Recital by Vilem Simek; Violin and Pianoforte; Sonata in E minor (Holobek); Witches' Dance, Op. 8 (Paganini). 5.55, Hints for Housewives. 6.0, See Prague. 6.10, Talk: Jan Levoslav Bella. 6.25, Introduction to the following Relay. 6.30, Weyland, the Smith—Opera (Bella). 9.30, See Prague. 10.0 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—11.0 a.m., Concert by the Silesian Philharmonic Orchestra, conducted by Rischka; Overture, Jean de Paris (Boieldieu); Italian Suite (Dostal); Serenade in G (Götze); Selection from The Hermit's Bell (Maillart); Egyptian March (Strauss); Overture, Marinarella (Fucik); Lehariana (Geiger); Waltz, Trau, schau, wem (Strauss). 12.45 p.m., Time, Weather, News and Exchange. 1.10, Fritz Behrend plays his own Pianoforte Compositions: Suite, Im Riesengebirge; Fritz-Reuter Suite. 2.0, Agricultural Prices. 2.15, Book Review: Great German Generals. 2.25, Talk: Late Autumn in the Isergebirge. 2.45, Programme for Children. 3.10, Concert by the Bert Rezlav Orchestra, relayed from Bad Altheide; Overture, Die schöne Galathee (Suppe); Potpourri (Lindemann); Selection from La Traviata (Verdi); Waltz, Du und Du (Strauss); Selection from Der Czarewitch (Lehár); Zigeunerweisen (Sarasate); Souvenir (Orfila); Two Tangos; Selection from Paganini (Lehár). 4.40, Agricultural Prices. 4.45 (approx.), Talk: Military Strategy and Defence. 5.5, Programme to be announced. 5.30, Talk by Workers and their Leaders. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, News. 7.10, The Gipsy Baron—Operetta in Three Acts (Strauss). 9.15, Time, Weather, and News. 9.40, Dance Music from Berlin (Funkstunde). 12 Midnight, Close Down.

## THURSDAY

## OCTOBER THE TWELFTH

## BRNO

878 kc/s, 342 metres; 35 kW.—3.0 p.m., Concert by the Station Orchestra. 3.50, Programme for Children. 4.15, Programme for Young People. 4.25, Gramophone Music. 4.35, See Prague. 4.50, Gramophone Music. 5.0, Theatre and Film Review. 5.15, See Prague. 5.25, German Transmission: News and a Radio Play (Gisela, with Music by H. Bruckmiller). 6.0, See Prague. 6.10, See Bratislava. 9.30, See Prague. 10.0 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Gramophone Music. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans: March from The Three Musketeers (Riesenefeld); Overture, Les cent Vierges (Lecoq); Serenade, Mon seul amour (Guillemin); Selection from The Merry Widow (Lehár); Violin Solo, Mazurka (Zarzycki); Why? (Langlois); Selection from Elle est à vous (Yvain); Waltz (Rappe); One-Step, All together (Mirrio). 5.0, Offenbach Concert by the Radio Orchestra, conducted by Walpot: Overture, La belle Hélène; Selection from La Périochole; Intermezzo and Barcarolle from The Tales of Hoffmann; Selection from The Drum-Major's Daughter. 5.30, Literary Programme for Young People. 6.0, Talk. 6.15, Gramophone Concert: Mazurka in A minor (Hopkin-Kreiser); Two Arias from Rigoletto (Verdi); Arabesques (Jeanjean); Tango (Albeniz-Kreiser). 6.30, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Ein Nachtlager in Granada (Krentzer); Ballet Suite, Joelynn (Godard); Concertino for Flute (Chaminade); Moorish Song and Estudiantina (Turina); Air from the Suite, En Bretagne (Barton). 7.15, Report for Workers. 7.30, Sports Notes. 8.0, Concert of Viennese Music by the Symphony Orchestra, conducted by Arthur Meulemans: Overture, Morning, Noon and Night (Suppe); Serenade (Joseph Strauss); Waltz, Wiener Burger (Ziehrer); Gramophone Records: (a) Lemir d'amour (Knosp), (b) Elegy (Massenet); Perpetuum mobile (Strauss); Viennese Song (Fall); Tales from the Vienna Woods (Strauss). 8.45, Talk: The New Parliamentary Session. 9.0, Concert by the Radio Orchestra, conducted by Charles Walpot: Overture, Die Fledermaus (Strauss); Waltz, Les Sirenes (Waldteufel); Selection from La Favorita (Donizetti); Gramophone Records: (a) Aria from The Girl of the Golden West (Puccini), (b) Aria from Martha (Flotow); Girl (Foot); Wailoon Suite (Wangermée); Selection from Dedé (Christiné). 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans: De Vlaamse leeuw (Miry); Pastoral Suite (Gilon); Aubade à Kiki (De Boeck); Huldebrock Potpourri; Three Flemish Songs; A Voyage round the World (Salabert); Ballet Suite, La Source (Delibes). 1.0 p.m., Le Journal Parlé. 1.10, Gramophone Music: Overture, Orpheus in the Underworld (Offenbach); Extracts from Maritana (Wallace); The Blue Danube (Strauss). 5.0, Symphonic Suite, Scheherazade (Rimsky-Korsakov), by the Station Symphony Orchestra, conducted by Meulemans. 5.45, Programme for Children. 6.30, Programme for Young People. 7.10, Catholic News. 7.30, Programme for Women. 8.0, Concert by the Radio Orchestra, conducted by Walpot; Soloist, Van Roey (Songs); Overture, The Thieving Magpie (Rossini); Three Pieces (Kettelbey); (a) In a Persian Market, (b) In a Monastery Garden, (c) Chal Romano; Two Flemish Songs; Spanish Suite (Albeniz). 8.45, Talk: Propaganda for World Peace. 9.0, Concert by the Station Symphony Orchestra, conducted by Meulemans; Soloist, Van Roey (Songs); Plinius fontein (Meulemans); Two Flemish Songs; Fantasia on two Flemish Airs (De Boeck); Canadian Fantasia (Gilon); Flemish Dances (Block). 9.55, Evening Prayer. 10.0, Le Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Dinico Orchestra. In the interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Light Music on Gramophone Records. 6.40, Educational Programme. 7.0, Song Recital by Edgar Istravty. 7.20, Symphony Concert by the Station Orchestra, conducted by Perlea: Leonora Overture, No. 3 (Beethoven); Concerto in C for Two Pianofortes (Bach); Fourth Symphony (Schumann). In an interval at 8.0, Talk. 8.45, Radio Journal.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 840 metres from 7.0 p.m. till Close Down. 4.30 p.m., Concert by the Karl Brna Cigány Band. 5.30, English Lesson. 6.0, Cello and Song Recital by Magda Rado and

Alexander Sved. 7.0, Radio Play. 9.0, News. 9.15, Extracts from the Sound Film, Grand Duchess Alexandra. 9.45, Concert by the Stefan Bertha Orchestra.

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time and Chimes from the Town Hall. 11.2, Concert by the Harald Andersen String Ensemble, relayed from the Hotel Anglettere. 1.0 p.m., Interval. 1.40, Pianoforte Recital by Otto Mortensen: Partita in B flat (Bach); Rondo in A minor (Mozart). 2.0, Concert by the Teddy Petersen Orchestra, relayed from the Wivex Restaurant. 3.45, Programme for Boys. 4.30, Exchange and Fish Market Prices. 4.45, Reading from My Life in Advertising by C. C. Hopkins. 5.15, English Lesson. 5.45, Weather. 6.0, News. 6.15, Time Signal. 6.16, Talk: Beethoven's Symphonies. 6.45, Danish Lesson. 7.10, Concert by the Station Symphony Orchestra, conducted by Nicolai Malko, relayed from the State Broadcasting Building. Soloist: Maria Nemeth (Songs): Symphony No. 1 in C (Beethoven); Aria from Don Giovanni (Mozart); Aria from Il Seraglio (Mozart); Prelude to the Ballet Ruse d'amour (Glanzov); Bacchanale from The Seasons (Glanzov); Overture, Euryantia (Weber); Aria from Oberon (Weber); Ecstasy (Serabini). 9.15, News. 9.30, Reading (Paludan). 9.50, Dance Music by the Juhl-Thomsen Band, relayed from the National Scala. In the interval at 11.0, Time and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

## CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Answers to Correspondents. 6.20, Miscellaneous Announcements. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45 till Close Down, See Warsaw. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C. 11.0, Happy Hour; Signature Tune; Animal Antics; Fairy Tale; Pale Moon; My Lady Dainty; Julian; The busy bee; When day is done; The Enchanted Forest; Isn't it heavenly; My gipsy Rhapsody; From me to you! Who ate our Nell? Love Songs of the Nile; It was a Night in June; At the old Pig and Whistle; It's Sunday down in Caroline; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Quartet Concert for Worthing and Littlehampton Listeners; Signature Tune; The Night by the Sea; Pan and the Wood Goblins (Rathke); Song, Only a Rose (Friml); Dreams on the Ocean (Gungl); Stephanie Gavotte (Czibulka); In the gloaming (Harrison); In Tulip time beside the Water-mill (Alibout); Homing (del Riego); I do like to be beside the Seaside (Glover). 5.30, Request Concert for Brighton and Hove Listeners; Hits from Forty-Second Street; In a monastery garden (Kettelbey); Serenade (Heykens); My heart stood still; Love's old sweet Song; The Sunshine of your Smile; Chanson bohémienne (Baldi); Bells across the Meadow (Kettelbey); Signature Tune. 6.0, Programme in French. 10.0 till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune, Bells of Normandy; Adorable; Isn't it heavenly?; Let's call it a Day; From me to you; P.C. 123; Maria my own; At the old Pig and Whistle; Castles in the Sand; A Woman should stick to her Man; Love Songs of the Nile; Sweet dreams, pretty Lady; Tick, Tock; Sundown in a little green hollow; Lazybones; All over Italy; In Santa Lucia; Signature Tune. 11.0, Tunes from the Talkies; Signature Tune, Sittin' in the Dark; You don't understand; Love Songs of the Nile; My oh, my; Reaching for the Moon; Let's all be happy together; Heaven will protect an honest Girl; Selection from Congress Dances; In the Park in Pares; Signature Tune. 11.30, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of Hospitals' Trust, Ltd.; Signature Tune. Come back to Erin; Selection from The Gipsy Princess (Kálmán); Fleurette (Fletcher); Father O'Flynn; Selection from Das Kind von Alsace (Lehár); The Shamrock; Silent, O Moyle; At the Convent Gate (Sherwood); The Wedding of the Rose (Jessel); Signature Tune. Come back to Erin. 12.5 a.m. (Friday), News Bulletin in English. 12.10, Club Concert for Rugeley Listeners. Part I, Tango Band; Signature Tune, The Chum Song; I'll keep you in my heart always; The Song of the Rose; Julian; Jealousy; In Santa Lucia. Part II, Dance Music by the Blue Mountaineers (Electrical Transcriptions); Won't you stay to Tea?; There's a tiny little hair upon your shoulder; Fit as a fiddle; Taboo, Taboo; There's a Cabin in the Pines; Jog along; When it's Lamp-lighting Time in the Valley; The Language of Love; In the Valley of the Moon; Hold me. 1.0, Dance Music: Signature Tune, The Bells of Normandy; Isn't it heavenly?; He was only a Poor Musician; Talking to you about me; I'm getting sentimental over you;

OCT. 12th **THURSDAY** continued

My Love Song; Someone stole Gabriel's Horn; I wish I had Wings; I've got to sing a Torch Song; In a little Second-hand Store; Hiawatha's Lullaby; I cover the Water-front; This lovely Rose; One tiny Tear; You don't Understand; Peter, Peter; Sweep; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

**FLENSBURG.**—See Hamburg.

**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, 1,220 kc/s, 245.9 metres; and Trier, 1,157 kc/s, 259.3 metres.—12.35 to 1.30 p.m., Concert. 2.30, Weather. 2.40, Time and Economic Notes. 3.0, See Langenberg. 5.0 to 5.35, See Stuttgart. 5.35, Talk: The New Unity of Germany. 5.50, Weather and News. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, Topical Talk. 7.10, Bezaubernde Fräulein (Bewitching Maiden)—Musical Play (Benatzky). 8.30, The Skilled Trades—Radio Sequence. 9.0, Time and News. 9.20, See Stuttgart. 9.30, Local News and Weather. 9.40 to 12 Midnight, See Langenberg. 12 Midnight, Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., See Heilsberg. 4.0, De Ebener—Dialect Play in One Act (Diers). 4.30, Topical Talk. 5.0, Song Recital by Oskar Jölli. 5.35, Talk: The Musical Programmes of the Coming Week. 5.45, Frankfurt Exchange and Market Prices. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, Concert by the Hamburg Philharmonic Orchestra, conducted by Eibenschütz: Overture, Das befreite Deutschland, Op. 126 (Spohr); Symphony No. 1 in D minor, Op. 4—From the North Sea (Koch); Am Strande von Sorrent from Aus Italien, Op. 16 (R. Strauss); Märkische Suite, Op. 92 (Kam). 8.30, Otto Brües reads from his own works. 9.0, Time and News. 9.20, Dance Music from Berlin (Funkstunde). 12 Midnight, Close Down.

**HANOVER.**—See Hamburg.

**HEILSBERG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert of Light Music. In the intervals at 12.20 and 1.0, News. 1.30 (from Danzig), Exchange. 2.0, Agricultural Prices and Exchange. 2.30, Programme for Children. 3.0, Concert by the Small Station Orchestra, conducted by Wilken: Overture, The Secret (Smetana); Berceuse (Cul); Gavotte Caprice (Borkiewicz); Dynamiden Walzer (Jos. Strauss); Selection from Fra Diavolo (Auber); Scène poétique (Godard); Overture, Le postillon de Longjumeau (Adam). In the interval, Book Review. 4.30, Talk: Old Königsberg and its First Mayors. 4.50, Chamber Music for Wind Instruments: Quartet for Flute, Oboe, Clarinet and Bassoon (Hoefgart); Divertimento No. 4 in B flat for Flute, Clarinet and Bassoon (Mozart). 5.15, Agricultural Prices. 5.25, Agricultural Talk. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, Weather and News. 7.10, Hans Helling—Opera (Marschner), relayed from the Königsberg Opera House. In the interval at 9.15 (approx.), Weather, News and Sports Notes.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m. and 20 kW. (from 5.40 p.m.). Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.).—7.40 a.m., Time Signal. 7.41, Gramophone Records. 9.40, Time Signal. 9.41, The Daily Service. 9.55, Gramophone Records. 10.10, Pianoforte and Cello Recital by Solange Cats and Krol. Kindeszenen (Schumann); Fantasie-Stücke (Schumann); Ballade (Chopin); Jeux d'eau (Ravel); Goyescas (Granados-Cassado); The Flight of the Bumble Bee (Rimsky-Korsakov); Requiebros (Cassado). In the interval at 10.40, Recitation. 11.40, Time Signal. 11.41, Concert by the Wireless Orchestra, conducted by Niel Gerharz: Andalusian March (Esslinger); Overture to a Musical Comedy (Lincke); Schlosswaehle der Ameisen (Rathke); Ein Tag im Wienerwald (Kreuzberger); Waltz, Estudiantina (Waldteufel); Selection from La Perichole (Offenbach); Hungarian Comedy Overture (Keler Bela); Autumn Shadows (Clarke); The Gazelle (Myddleton); Selection from Die Bayadere (Kalmán); Gramophone Records: Tales from the Vienna Woods (Strauss); Two Intermezzi (Ganglbauer): (a) Akeley, (b) Kom zu mir; Potpourri (Morena). 1.55 to 2.10 p.m., Interval. 2.10, Concert

(contd.): Overture, Orpheus in the Underworld (Offenbach); Babilage (Gillet); Selection from Masaniello (Auber). 2.40, Dressmaking Lesson. 3.25, Gramophone Records. 3.40, Programme for Hospitals. 4.10, Gramophone Records. 4.40, Programme for Children. 5.10, Concert of Light Music. In the interval at 6.10, Sports Talk. 7.10, English Lesson. 7.40, Time Signal. 7.41, News. 7.45, Gramophone Records. 7.55, Wagner Concert by an Orchestra, Choir and Soloists: Chorus from The Mastersingers; Selection from Taubhäuser; Three Poems; Selection from The Flying Dutchman. 8.55, Gramophone Records. 9.10, Concert by the Concertgebouw Orchestra, conducted by Mengelberg, relayed from the Concert Hall, Amsterdam. 9.55, Gramophone Records. 10.10, Concert of Light Music. 10.40, News. 10.50, Gramophone Records. 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. (until 3.40 p.m.). Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—11.55 a.m. to 1.40 p.m., Programme of the Catholic Radio Society (K.R.O.). 11.55, Concert by the K.R.O. Orchestra, conducted by van 't Woud. Gramophone Music in the interval. 1.40 p.m. till Close Down, Programme of the Christian Radio Society (N.C.R.V.). 1.40, Book-keeping Lesson. 2.40, Gramophone Music. 3.10 to 3.40, Interval. 3.40, Bible Reading and Sacred Music. 4.40, Handwork Lesson for Young People. 5.10, Concert by the Columbia Three: Florentine March (Fucik); Spanish Serenade (Metra); Overture, Norma (Bellini); Potpourri (Ciére); Gramophone Music: Overture, Tanager (Rossini); Melody (Wesley); Offenbachiana (Conradi); Selection from The Bird Fancier (Zeller); March, Hoch Heideckburg (Herzer). 6.25, Gramophone Music. 6.40, Police Notes. 6.55, Gramophone Music (contd.). 7.10, Press Review. 7.40, Missionary Discussion. In the intervals, Gramophone Music. 9.10, Gramophone Music. 9.30, News. 9.40, Talk for Parents. 10.10, Gramophone Music. 11.10 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**KALUNDBORG.**—See Copenhagen.

**KATOWICE**

734 kc/s, 408 metres; 16 kW.—6.20 p.m., Announcements and Gramophone Music. 6.25, See Warsaw. 7.0, Concert by the Symphony Orchestra, relayed from Warsaw. In the interval Soprano Solos, relayed from Lwow, and The Letter Box. 9.0, See Warsaw.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres, 60 kW.—11.0 a.m., Concert from Stuttgart. 12.15 p.m., Time and News, from Frankfurt. 12.25, News and Weather. 12.35, Concert, from Frankfurt. 1.30, Talk for Students: Careers. 2.0, A Story of the Great War. 2.10, Reading in Dialect. 2.30, Economic Notes. 2.50, Political Announcements. 3.0, Concert: Part 1: The Fröhliche Fünf, a Vocal Sextet, and Willi Schneider (Baritone); Music by the Fröhliche Fünf: Three Folk Songs: (a) Das Leben bringt gross' Freud, (b) Der Postillon, (c) Kruckuck-Harem; Music by the Fröhliche Fünf: Two Songs: (a) Im Traum (Stolz), (b) Am schönsten ist's in meiner Heimat (Stransky); Part 2: The Station Orchestra, conducted by Buschkötter: Comedy Overture (Fiedler); Suite, Catalonia (Albeniz); Waltz, Herbstweisen (Strauss); Romanian Rhapsody No. 2 (Enesco); Selection from Die schöne Galathee (Suppé). 5.0 to 5.35, See Stuttgart. 5.35, Talk: Health Insurance. 5.50, News. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0 to 9.20, See Frankfurt. 9.20, See Stuttgart. 9.30, News. 9.40, Serenade on Gramophone Records. 10.0, Concert of Sixteenth and Seventeenth Century Chamber Music, by the Cologne Violin Ensemble and Hans Haass (Harpischord); Fantasia for Two Violins (di Lasso); Fantasia for Three Violins (Gibbons); Fantasia for Three Violins (Danann); Three Fantasias for Four Violins (Isaac); Fantasia on One Note for Five Violins (Purcell); Fantasia for Five Violins (Bach); Interlude of Classical Songs and Ballads by Strienz (Bass) and Grape (Pianoforte); Sonata da Chiesa in B minor, Op. 3, No. 4, for Two Violins, 'Cello, and Harpsichord (Corelli); Sonata in D for Violin; Viola da Gamba, 'Cello and Harpsichord (Leclair); Quartet in E minor for Flute, Violin, Viola da Gamba, and Harpsichord (Telemann). 11.0, Serenade on Gramophone Records. 12 Midnight, Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m., Concert from Stuttgart. 12.15 p.m., News and Programme Announcements.

12.20, Gramophone Concert: Serenade from the String Quartet in F (Haydn); Divertimento No. 4 for Flute, Clarinet and Bassoon (Mozart); Two Songs (Schubert): (a) Ungeduld, (b) Ständchen; Movement from the String Quartet in E Flat (Dittersdorf); Song from Der Vorschwender (Kreutzer); Loreley Rheinklänge (Strauss); Tales from the Vienna Woods (Strauss); The Blue Danube (Strauss); The Good Old Times (Strauss); Hofballtänze (Lanner). 1.15, News. 1.30, Astronomy for Young People. 2.0, Music from Recent Sound Films. 2.35, Market Prices. 3.0, Concert by the Leipzig String Quartet. 4.30, Talk: The Basques. 4.50, Economic Notes, News, Weather and Time. 5.0, Italian Lesson. 5.30, Variations on an Original Theme, Op. 21, No. 1 (Brahms), played by Hans Grisch (Pianoforte). 5.50, Review of the Day's Events. 6.0, Transmission for all German Stations: Central Germany—Land of Destiny. 7.5, Brandenburg Concerto No. 3 (Bach). 7.25, Concert Relay. 9.0, News, followed by Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Serbo-Croatian Lesson. 6.30, Gramophone Music. 7.0, Programme from Belgrade. 9.0, Weather and News. 9.15, Dance Music by the Radio Jazz Band. 10.0 (approx.), Close Down.

**LUXEMBOURG**

252 kc/s, 1,191 metres; 200 kW.—German Evening.—7.30 p.m., Gramophone Concert of Variety Music. 8.5, Talk in German on Superstition. 8.20, Song Recital by Elisabeth Corty: Ave Maria, from Otello (Verdi); Aria from Il re pastore (Mozart); Song from Die Fledermaus (Joh. Strauss); Songs (Schubert): (a) In Frühling, (b) Der Mühsenoh, (c) Liebesbotschaft, (d) In Abendrot; Furs reise (Hugo Wolf). 8.50, News in French. 9.0, Concert of German Music by the Station Orchestra, conducted by Henri Pensis: Academic Festival Overture (Brahms); Andante from the Fifth Symphony (Beethoven); Oriental Pictures (Unger); Ständchen (R. Strauss); Overture, The Flying Dutchman (Wagner). 9.45, News in German. 9.55, Concert by the Station Orchestra, conducted by Henri Pensis: Dance of the Bayaderes (Rubinstein); Harp Serenade (Deyschlaegel); The Rosary (Nevin); Suite, Der Minnesänger (Amadei). 10.25, Dance Music on Gramophone Records.

**LWOW**

788 kc/s, 381 metres; 16 kW.—6.5 p.m., Announcements and Gramophone Music. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 7.0, Song Recital by Mme. Franciszka Platt. In the interval, Orchestral Music from Warsaw. 9.0, See Warsaw. 9.10, Literary and Musical Programme. 9.25, Chamber Music, by Sznapper (Violin), Szydlowski ('Cello), and Chruszewska (Pianoforte). 10.0, See Warsaw. 10.5, Gramophone Music. 10.30 (approx.), Close Down.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.30 p.m., Radio Gazette for Lyons and the South-East. 8.30, Concert: Duet for 'Cello and Pianoforte (Weber); Songs (de Breville); Pianoforte Solos: (a) Sonata (Galuppi), (b) Fugue (Frescobaldi), (c) Sonata (Scarlatti); Clarinet and Pianoforte: Fantasiestücke (Schumann); Au bord d'une source (Liszt); La cigale (Chausson); Arpège (Faure); Shylock's Song (Faure); Extracts from Love for the Three Oranges (Prokofiev); Trio in B flat for Clarinet and 'Cello (Beethoven). After the Concert, News.

**MADRID**

ARANJUEZ (EAO), 9,860 kc/s, 30.43 metres; 20 kW.—10.30 p.m. till 12 Midnight, Spanish National Day "—Festival Programme. 12 Midnight till Close Down, Programme in English by the I.B.C. 12 Midnight, Concert: Black-eyed Susan Brown; Selection from The Count of Luxembourg; Humming to myself; A Girl; Hawaiian Sweetheart of mine; Please; The Siege of Monte Carlo; Smile, darn yer smile. 12.30 a.m. (Friday), I.B.C. Good-night Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange and Programme for Children. 8.15, Topical Review. 8.30 to 10.0, Interval. 10.0, Chimes, Time and Topical Review. 10.20 (approx.), Concert. 12.15 a.m. (Friday), Topical Review. 12.30, Chimes. 1.0 to 2.0, Programme in English by the I.B.C.: Dance Music: Two Tickets to Georgia; Hawaiian Waltz Medley; It's Time to sing Sweet Adeline again; Blue Prelude; Montana Call; You're Charming; Sweet Hawaiian Dreams; Margie; My Wish-ing Song; Let's try again; Fiesta; Oh, Peter; I've got the world on a string; Soft Lights and Sweet Music; Stay on the Right Side of the Road; Waltzing in a Dream.

2.0, I.B.C. Goodnight Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—6.30 p.m., German Transmission: Two Talks: (a) Jacob Grimm, (b) Goethe. 6.0, See Prague. 6.10, See Bratislava. 9.30, See Prague. 10.0 (approx.), Close Down.

**MOSCOW**

**TRADES UNION,** 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m. and 1.45 p.m., Weather. 2.0, Gramophone Records of Caruso and Kreisler. 3.0, English Lesson. 3.30, Talk. 4.30, A Play (Valentin Kataiev). In the intervals, Music by Albeniz, Techerpin, Debussy, Krassev and Zeller. 5.30, Orchestral Concert, conducted by Orlov; Soloist, Barsova (Soprano); Waltzes by Waldteufel, Joh. Strauss, Rubinstein, Liadov, Tchaikovsky, Stravinsky and Glazunov. 8.0, News. 8.30, Programme Announcements. 8.55, Time. 9.5, Press Review. 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Orchestral Concert, conducted by Erich Kloss. Soloist: Dina Grolmann (Soprano). Overture, The Barber of Seville (Rossini); Bagatelles (Dvorak); Suite Johannes Brahms (Fritz); Waltz, Die Koseniden (Lanner); Arias from Turandot (Puccini) and Madame Butterfly (Puccini); Fascination (Marchetti); Chant d'automne (Tchaikovsky); Norwegian Peasant Dance (Selytte). 4.40, Agricultural Talk. 5.0, Schrammel Music: March, Frei weg (Latan); Waltz, Verschmähte Liebe (Lincke); Tango, Wenn du mich lieb hast (Rixner); Loreley Paraphrase (Nesvadba); Potpourri of Bavarian Folk Music (Seidel); Zither Solo; Upper Bavarian Ländler; March. 5.45, Time and Announcements. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, Concert of Light Music by the Station Orchestra, conducted by Karl List. Soloist: Maria Olzewska (Contralto). 8.0, The 1933 Harvest—Radio Sequence (Andreas Weinberger). 9.0, Time and News.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Orchestral Concert. 5.0, German Lesson. 5.30, Divine Service. 6.0, News. 6.30, Songs to the Lute and Saxophone Solos: You are my Heart's Delight, from The Land of Smiles (Lehár); Two Guitars (Horlich); Valse triste (Vecsey); Gloria (Hager). 7.0, Time Signal. 7.2, Agricultural Report. 7.30, Nils Geir Tveit in a Pianoforte Recital of his own Music. 8.0, Political Talk by a Labour Leader. 8.20, Recital on Two Pianofortes by Victor Babin and Vitya Wronsky: Sonata in G Minor (Paganini); Gigue in G (Bach); Perzapzetti (Casella); Rondo in C (Chopin). 8.40, News. 9.0, Topical Talk. 9.15, Dances in Old Style for Violin and Pianoforte. 9.45 (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Announcements and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Concert of Light Music: March (Borel); Banderilleros (Gnecco); Suite goliardica (Amadei); Girls (Muratori); La pattuglia degli zigrani (Ranzato). 8.30, Le chef et le secrétaire (The Cook and the Secretary)—One-Act Comedy (Scribe). 8.50 (approx.), Concert (contd.): Waltz, The Blue Danube (Joh. Strauss); Bolero (Bili); Tesoro mio (Beuceli); Moravian Dance (Joncières); Waltz, Künstlerleben (Joh. Strauss); March, Fantasia (Barthelemy); Finale from Madama di Tebe (Lombardo). 10.0, Giornale Radio.

**PARIS**

**PASTE PARISIEN,** 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Concert: Waltz, Tales from the Vienna Woods (Joh. Strauss); Waltz, The Blue Danube (Joh. Strauss); Caprice viennois (Kriesler); Waltz, Frühlingsstimmen (Joh. Strauss). 7.15, Le Journal Parlé. 7.30, Programme for Children. 8.0, Talk. 8.5, Topical Talk. 8.35, Sponsored Gramophone Concert. 9.35, Concert by the Station Orchestra. 10.35, News.

**PARIS**

**RADIO-PARIS.** Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.40 a.m., Weather and Physical Culture. 7.45, Gramophone Records: Humoresque (Dvorak); Polka (Weinberger); Ronda aragonesa (Granados); Sivar Buckateton (Kun). 8.0, Weather and Press Review. 12.0 Noon, Protestant Address. 12.30 p.m., Gramophone Concert. Part 1—For Young People: Kinderlieder (Hildebrand); Becassine (Baer-Humble);

OCT. 12th **THURSDAY** continued

Les Malheurs de Sophie (Humble-Montgon); The Kingfisher (Gerard); La Mort du Pelican (de Musset); At the Fair (Bachand Laverne); Memories of the Circus (Peter); The Doll (Wacek); Les œufs à la Coque; Selection from Cocorico (Ganne); Musical Saw Duet, Trop Tard (Aurelli and Keyne); In Mickey's Kingdom; French Songs (Misraki), Part 2—Variety Music: Violin Solo: Two Humorous Pieces (Leonard); Anatole, tu l'as connu (Bousquet); Eh, bien mon'ieux (Bousquet); Enregistrement (Pauley); Piliers d'Estaminet (Wicheler); Le plus beau jour (Wicheler); Ca c'est tout le Midi (Mauricet-Varenne). In the interval at 1.0, Exchange, News and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.50, Legal Talk. 7.0, Talk: The Exploitation of Morocco. 7.20, Gramophone Music: Arab March (Ganne); Air from La belle Hélène (Offenbach); Hungarian Melody (Liszt); Mannequins (Szulc); Ideale (Tosti); Slav Dance (Dvorák). 7.45, Review of the German Press. 8.0, La Course du Flambeau—Play (Hervieu). In the interval at 8.30, News and Weather; at 8.40, Review by Christophe, and at 9.15, Press Review and News.

**PITTSBURGH**

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.86 metres and 25.27 metres.—8.0 p.m., Programme to be announced. 8.15, Quilting Party. 8.30, Words and Music, from New York. 8.45, Federation of Pennsylvania Women. 9.0, Betty and Bob, from New York. 9.30, News and Markets. 9.45, Thursday Special, from New York. 10.0, Federation of Women's Clubs. 10.15, KDKA Kiddies Klub. 10.30, The Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News. Piano Classique. 11.15, Sports. A Song. 11.30, Pittsburgh Spotlights. 11.45, Lowell Thomas, from New York. 12 Midnight, Amos 'n' Andy, from New York. 12.15 a.m. (Friday), Marvellous Melodies. 12.30, Concert Footlights, from New York. 12.45, Pathé News of the Air. 1.0 to 4.0, New York Relay. 1.0, Captain Diamond. 1.30, Adventures in Health. 1.45, The Rollickers. 2.0, Death Valley Days. 2.30, Lady Esther Serenade. 3.0, Hands Across the Border. 3.30, Echoes of the Palisades.

PORSGRUND.—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Brno. 4.15, Talk on Economics. 4.25, Gramophone Music. 4.35, French Lesson. 4.50, Gramophone Music. 5.5, Agricultural Talk. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission; Talk on Agriculture and Medical Talk. 6.0, Time and News. 6.10 to 9.30, See Bratislava. 9.30, News. 9.45, Gramophone Music. 10.0 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

SOTTENS; 743 kc/s, 403 metres; 25 kW; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Gramophone Music. 12 Noon (from Lausanne), Financial News. 12.10 p.m. (from Lausanne), Gramophone Music. 1.0 to 2.28, Interval. 2.28, Time Signal from Neuchâtel Observatory. 2.30 (from Geneva), Gramophone Music. 3.15 (from Geneva), Interludes by Edouard Combe. 3.40 (from Geneva), Gramophone Music. 4.30 to 6.0, Interval. 6.0 (from Geneva), Talk. 6.30 (from Geneva), Weather, News, and Announcements. 7.0 (from Geneva), Talk: A Stradivarius Epic. 7.15 (from Geneva), Talk, with Illustrations: Grétry and his Opéra-comique, Isabelle et Gertrude. 7.45 (from Geneva), Variety Items relayed from the Exhibition at the Kursaal. 8.0 (from Geneva), Concert by the Radio-Suisse Romande Orchestra, relayed from the Exhibition at the Kursaal. Conductor, Robert Echenard: Overture, Le Roi d'Ys (Lalo); Ballet Music from Céphale et Procris (Grétry); The Flight of the Bumble Bee (Rimsky-Korsakov); Vibrapone and Marimba Solos; Selection from the Ballet, La boutique fantasque (Rossini-Respighi); Lagunenwalzer (Joh. Strauss). 8.50, News and Weather. 9.0 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

**REYKJAVIK**

250 kc/s, 1,200 metres; 21 kW.—8.5 p.m., Musical Programme. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, Chimes and News. 9.30, Reading. 10.0, Concert by the Station Trio, followed by Icelandic Songs (on Gramophone Records).

**RIGA**

525 metres; 15 kW.—6.5 p.m., Concert of Operetta Music. In the intervals at 7.0, News, and at 8.0, Weather and News. 8.30, The Seventh Symphony (Beethoven) on Gramophone Records.

RJUKAN.—See Oslo.

**ROME**

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 2.30 p.m. (approx.); and 2RO, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—11.30 a.m., Gramophone Music. 12.5 p.m., Humorous Reading. 12.10, Concert from Turin. In the interval from 12.30 to 12.45, Giornale Radio and Exchange. 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.50, Giornale Radio and Exchange. 4.0, Reading. 4.10, Weather. 4.15 to 5.10, Vocal and Instrumental Concert; Ornella Puliti-Santoliquido (Pianoforte), Maria Romano (Soprano), and Giulo del Signore (Tenor); Pianoforte Solos: (a) Suite infantile (Giardini), (b) Giardini notturni (Santoliquido); Soprano Solos: (a) Aria from Isabeau (Mascagni), (b) Aria from Fedora (Giordano); Tenor Solos: (a) Vaghiissime sembianze (Donaudy), (b) Serenade from Don Pasquale (Donizetti), (c) Aria from Salvatore Rosa (Gomez); Pianoforte Solos: (a) Madrigale (Vito Frazzi), (b) Poemetto campestre (Montani); Soprano Solo: Aria from Loreley (Catalani). 5.45, (Naples), Shipping and Sports Notes. 5.45, Dopolaro and Tourist Report. 6.10, Grain Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Gramophone Music. 7.30, La Wally—Opera in Four Acts (Catalani). In the intervals, Readings; (a) Second Act of La Gioconda (d'Annunzio), (b) Consolazione (d'Annunzio), (c) Un ricordo (Pascoli). Giornale Radio after the Opera.

SALZBURG.—See Vienna.

**SCHENECTADY**

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—12.45 a.m. (Friday), Stock Reports. 1.0, Popular Programme from New York. 2.0, Capt. Henry's Show Boat, from New York. 3.0, Variety Programme from New York, followed by Programme Resumé.

**SCHWEIZERISCHER  
LANDESENDER**

BEROMUNSTER, 653 kc/s, 459 metres; 80 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 a.m. to 6.5 (from Berne), Gymnastics. 10.59, Time Signal from Neuchâtel Observatory. 11.0 (from Basle), Operetta Music on Gramophone Records. 11.30, Time, Weather and News. 11.40 (from Basle), Modern Operetta and Sound Film Music on Gramophone Records. 12.25 (from Zürich), Time, Weather and Exchange. 12.45 to 4.0, Interval. 4.0 (from Zürich), Concert by the Small Station Orchestra, conducted by Scherbaum. 5.0 (from Berne), Gramophone Music. 5.30 (from Basle), Talk: Swiss Welfare Work. 6.0 (from Basle), Time, Weather and Traffic Report. 6.10 (from Basle), Symphonic Suite, Ein Heldenleben (R. Strauss), played by the New York Philharmonic Orchestra, conducted by Mengelberg (on Gramophone Records). 6.45 (from Basle), Elementary Italian Lesson. 7.30 (from Basle), Song Recital by Hermann Schey. 8.0, Weather and News. 8.10 (from Basle), The Trial of Socrates—Radio Play (Kysler). 9.15 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—4.5 p.m., Divine Service. 4.30, Programme for Children. 4.45, Gramophone Music. 5.45, Elementary English Lesson. 6.15, Weather and News. 6.30 (from Göteborg), Talk: Birthmarks. 7.0, Violin Recital by Jacques Thibaud: Chaconne (Vitali); Concerto in E Minor (Mendelssohn); Sonata in C Minor for Violin and Pianoforte (Grieg). 8.15, Reading. 8.45, Weather and News. 9.0, Light Orchestra Concert: Selection from Die Felsenmühle (Reissiger); Rustle of Spring (Sinding); Baroque Suite (Rangström); Selection from Tannhäuser (Wagner); Poem (Drda); The Nigger's Dream (Myddleton); Melody (Geiger). 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Popular Music on Gramophone Records. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Orchestral Concert, conducted by Maurice de Villers: Overture, Orpheus in the Underworld (Offenbach); Waltz, Die Romaniker (Lanner); Ich liebe dich (Grieg); Selection from Les noces de Jeannette (Massé); Loin du bal (Gillet); Babilage (Gillet); Highlanders Parade (Chauvet); March (Myddleton). 2.0, Programme for Children. 3.0, Interval. 4.0, Light Music on Gramophone Records. 4.45, French Elocution

Lesson. 5.0, Orchestral Concert, conducted by Roskam: Marche des cotillons (Poppy); Waltz Noctambula (Ziehrer); Prelude to Kunihiid (Kistner); Selection from The Bird Fancier (Zeller); Cello and Orchestra: Remembrance (Desprez); En sourdine (Telam); Love's Dream after the Ball (Czibulka); Selection from The Desert Song (Romberg); March, American Triumph (Savasta). 6.0, Talk in German: French Philosophy—From Cousin to Renan. 6.15, Talk on Cookery. 6.30, Gramophone Concert of Light Music. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Concert of French Music by the Station Orchestra, conducted by Maurice de Villers. Soloist: Jean Wolferstädter (Pianoforte) and Mine. Forest (Soprano). Pianoforte and Orchestra: Fantasia (Dumas); Soprano Solos: (a) La danse au bord du lac (Labey), (b) Promenade matinale (Bordes), (c) Promenade à Mule (Fourdrain); Cello and Orchestra: Rhapsody (Dumas); Musiques foraines (Fl. Schmidt); Soprano Solos (Poulenc): (a) Air romantique, (b) Air champêtre, (c) Air grave, (d) Air vif; Ballet Music, Siang-Sin (Hué). In an interval at 9.30 (approx.), Press Review. 10.30 (approx.), Close Down.

**STUTTART**

MUHLACKER, 832 kc/s, 360.5 metres; 80 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.35 to 1.30 p.m., See Frankfurt. 2.0, Programme for Children. 3.0, See Langenberg. 5.0, Spanish Lesson. 6.20, Talk. 5.35, Talk: Episode of the Early Days of German Colonisation. 5.50, Time and Market Prices. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0 to 9.20, See Frankfurt. 9.20, Talk: You must know... 9.30, Local News. 9.48 (approx.) to 12 Midnight, See Langenberg. 12 Midnight (approx.), Close Down.

SUNDSVALL.—See Stockholm.

**TOULOUSE**

799 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Military Band Music. 6.30, Light Music. 6.45, Septet (Saint-Saëns). 7.0, Music from Sound Films. 7.15, News. 7.30, Variety Music; Träumerei (Schumann); Archduke Albert March (Kozzak); Scherzo in B Flat (Schubert); Extase (Ganne). 7.45, Operetta Music: Arias from Les mousquetaires au couvent (Varney); Ciboulette (Hahn); La Mascotte (Audran); and Rip (Planquette). 8.0, Music by a Viennese Orchestra. 8.15, Opera Music: Aria from Mignon (Thomas); Duet from Manon (Masse-net); Aria from Tosca (Puccini); Trio from Faust (Gounod); Cavatina from Der Freischütz (Weber); Extract from La favorita (Donizetti); Aria from Herodiade (Masse-net). 8.45, Light Music. 9.0, Opera Music: Choruses from Carmen (Bizet), Cavalleria rusticana (Mascagni), Mirella (Gounod), Faust (Gounod), Lakmé (Delibes), Boris Godunov (Mussorgsky), and Aida (Verdi). 9.30, Orchestral Concert: Selection from The Queen of Spades (Tchaikovsky); Berceuse, from The Fire Bird (Stravinsky); March of the Dolls (Ziehrer); Selection from The Golden Cockerel (Rimsky-Korsakov); Toreador at Andalouse (Rubinstein). 10.0, Accordion Music. 10.15, News. 10.30, Concert for Listeners in Morocco. Part I, Opera Music: Prelude to The Third Act of Lohengrin (Wagner); Overture, Figaro (Mozart); Dance of the Tumblers, from The Damnation of Faust (Berlioz). Part II, Songs: The Two Grenadiers (Schumann); Nuit persane (Saint-Saëns); Shylock's Song (Fauré). 11.0, Dance Music. 11.45, Russian Songs and Balalaika Music. 12 Midnight, News. 12.5 a.m. (Friday), Music by a Viennese Orchestra. 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

TRONDHEIM.—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres, and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Gramophone Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolaro Announcements and Gramophone Music. 6.0, Time, Tourist Talk and Gramophone Music. 6.10, Agricultural Talk and Market Reports. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio, Weather and Gramophone Music. 7.25, Introductory Talk on the Following Transmission. 7.30, An Operetta in Three Acts. In the intervals, Talk and Theatre Notes. After the Operetta, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning), and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—

11.0 to 11.15 a.m., Religious Information in French. 8.0 to 8.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—12.10 p.m., Gramophone Concert of Classical Music: Aria from La Favorita (Donizetti); Après un rêve (Fauré); Cello Solo, Abcunlied (Schumann); Two Arias from Samson and Delilah (Saint-Saëns); Selection from André Chénier (Giordano); O Star of Eve, from Tannhäuser (Wagner); Violin Solo, La Capricieuse (Elgar); Aria from Turandot (Puccini); Extracts from L'Africaine (Meyerbeer); Coloratura Variations (Proch). 1.0, Interval. 2.0, Time and Announcements. 2.20, Talk for Housewives. 2.30, Programme for Children. 2.55, Gramophone Concert of Light Music: Overture, The Gipsy Baron (Johann Strauss); Interlude and Ballet Music from Rosamunde (Schubert); Parles moi d'amour (Lenoir); Lehár Potpourri (arr. Benedict); Waltz, Frühlingsstimmen (Strauss); Caucasian Suite (Ippolitov-Ivanov). 3.45, Report in Esperanto on Austrian Affairs. 3.55, Theatre Review. 4.0, Talk for Women: The University Woman. 4.25, Song and Pianoforte Recital by Elfriede Hedmond (Contralto) and Josefine Rodler: Pianoforte Solos (Liszt): (a) Two Petrarch Sonnets (Liszt), (b) Polonaise in E; Contralto Solos (Schubert): (a) Liebesbotschaft, (b) Lob der Tränen, (c) Am Meer, (d) Die böse Farbe, (e) Gretchen am Spinnrad, (f) Ständchen. 5.50, Talk on Economic Reconstruction. 5.30, Talk: The History of Carinthia. 6.0, Under the Crescent—Concert by the Wiener Symphoniker, conducted by Max Schönherr: Overture, The Barber of Bagdad (Cornelius); Turkish March (Beethoven); Entr'acte and Ballet Music from Ali Baba (Cherubini); Egyptian Dance (Friml); Overture, Abu Hassan (Weber); Waltz, Nilfluten (Joh. Strauss); Persian Suite (Rubinstein-Morena); Persian March (Joh. Strauss); Two Dances from The Arabian Nights (Bortkiewicz); Anatolian Dance (Weninger); Turkish March from Fatinitza (Suppé). In an interval at 6.35, Time and Announcements. 7.15, Topical Talk. 7.30, Reading (Anders Gatholm). 8.0, Concert by the Wiener Symphoniker, conducted by Martin Spörr; Soloist, Edith Lorand (Violin): Overture, The Water Carrier (Cherubini); Violin Concerto in D (Tchaikovsky); Petite Suite (Bizet); Hungarian Dance (Brahms-Kreiser); A la Viennoise (Friedman); Violin Solo, Spanish Dance (Falla); Polonaise in E (Liszt). 9.15, News. 9.30, Dance Music on Gramophone Records, followed by Announcements: Potpourri, Was der Donau erzählt (Amilmo Morena); Foxtrot, Was kümmert mich die ganze Welt (Paul Abraham); Paso doble, Wien bleibt Wien (Johann Schrammel-Michaeloff); Foxtrot, Gibts im Radio Tanzmusik! (Willi Kollo); Tango, Im Krug zum grünen Kranz (German-Rosen-Lion); Foxtrot, Warum, Weshalb, wieso? (Künneke-Bertuch-Schwabach); Foxtrot, Mir ist so, ich weiss nicht wie (Werner-Heymann); Tango Song, Ein Lied geht um die Welt (Hans May); Tango Zigeuner, du hast mein Herz gestohlen (Egen-Grothe-Schwabach); Waltz, Balgelfüster (Meyer-Ilmhold); Foxtrot, Schwarze Katharina (Weiss-Schwarz); Foxtrot, Ich kauf' mir 'ne Rakete (Paul Abraham); Potpourri, Das ist Johann Strauss.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.55 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Gramophone Music. 11.30, Radio Journal and Weather. 11.35, Moniuszko Concert by the Philharmonic Orchestra, conducted by Oziminski. Soloists: Wilkomirski (Cello) and Bromke (Trumpet): Overture, The Countess. Cello Solo: Polonaise from The Countess; Dance from Halka; Melody; Overture, Bajka. Trumpet Solo: Evening Song; Mazurka from Halka. 1.0 p.m., Interval. 2.30, Agricultural Notes. 2.40, Light Music, relayed from Cracow, 950 kc/s, 315 metres. 3.40, Talk for Women. 3.55, Soloist Concert, relayed from Wilno, 533 kc/s, 563 metres. 4.50, Agricultural Notes. 5.0, Talk. 5.20, Dramatic Programme. 6.5, Announcements. 6.25, Topical Talk. 6.40, Programme Announcements. 6.45, Radio Journal. 6.55, Interval. 7.0, Concert by the Symphony Orchestra, conducted by Nawrot: Carnival Overture (Dvorak); Divertissement from Les Erynnies (Masset); Japanese Suite (Gibson); Andante (Svendsen); Scherzo-Krakoviak (Sygietynski); Ballet Music from The Demon (Rubinstein); Valse triste (Nedbal); Les moissons (Poviadovsky). In the intervals, Soprano Solos, relayed from Lwów, 788 kc/s, 381 metres, and Answers to Correspondence. 9.0, Sports Notes. 9.10, Dance Music. 10.0, Weather and Police Notes. 10.5, Dance Music. 10.30 (approx.), Close Down.

**WILNO**

533 kc/s, 563 metres; 16 kW.—6.5 p.m., The Letter Box. 6.25 till Close Down, See Warsaw.

ZÜRICH.—See Schweizerischer Landessender.

FRIDAY OCTOBER THE THIRTEENTH

ALGIERS

824 kc/s, 364 metres; 13 kW.—7.35 p.m., Hunting-Horn Solos, 7.55, News, 8.0, Time Signal, 8.2, Lottery Results, 8.10, Symphony Concert: Fifth Symphony (Beethoven), 8.40, News, 8.45, Songs on Gramophone Records, 9.0, Concert (cont'd.): Extracts from Fellenas and Mélisande (Fauré), 9.30, News, 9.35, Concert (cont'd.): Prelude to Le Miracle (Hüe); Scènes alsaciennes (Massenet), 9.55, News.

ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1.337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather, Stock Report and Gramophone Concert, 6.0, Programme for Children, 6.45, News, 7.0, Gardening Talk, 7.15, Literary and Dramatic Talk, 7.30, Time Signal, 7.31, Concert by the Station Orchestra, 8.0, Song Duets by B. Byrne and A. Dunne, 8.20, Play by Gabriel Fallon and Company, 8.50, Mezzo-Soprano Solos by Bridie Molony, 9.5, Concert by the Station Orchestra, 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd., 9.30, Concert: Overture, Figaro (Mozart); I'm called Little Buttercup, from H.M.S., Pianoforte (Sullivan); Orchestra: Cherry Ripe (Bridge); Brightly dawns our Wedding Day, from The Mikado (Sullivan); Silvered is the Raven Hair, from Patience (Sullivan); Orchestra: Bolly on the Shore (Grainger); A Regular Royal Queen, from The Gondoliers (Sullivan); Orchestra: Over the Waves (Kosas); Wireless World Announcement, 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on Behalf of Hospitals: Trist, Ltd.; Maria my own (Lecounta); Zigener, you have stolen my heart (Egen); Pink Elephants (Woods); Racing Commentary: Puss, Puss, Puss (Hargreaves); Marry me (Krausz); I give my heart, from The Dubarry (Milkhofer); Good-night, but not Good-bye, 10.30, I.B.C. Good-night Melody, followed by News and Weather, 10.40, Traditional Music, 11.0 (approx.), Close Down.

BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Overture, The Caliph of Bagdad (Boieldieu); Andantino con espressione (Mozart); Seventeenth Century Ballet Music (Offenbach); Selection from The Valkyrie (Wagner); Entr'acte (Humphries); Appassionato (Ackermans); Selection from Il Trovatore (Verdi), 7.0, Request Gramophone Records, In an interval at 7.30, Exchange, 8.0, Gramophone Music and News, 9.0, Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices, 9.5, Concert by the Station Orchestra, 10.0, Recitation of Catalan Poems, 10.15, Quartet in E Flat (Beethoven), 10.30, Dance Music, relayed from the Casa Libre, In the interval at 11.0, News, 12 Midnight (approx.), Close Down.

BARI

1,112 kc/s, 269.8 metres; 20 kW., 11.30 a.m., Quintet Concert, 12 Noon (approx.) to 3.30 p.m., See Rome, 3.30, Gramophone Music, 3.55 to 5.35, See Rome, 5.35, News in Albanian, 5.45 (approx.) till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—5.55 p.m., Time and Programme Announcements, 6.0, Concert by the Station Orchestra, 7.0, Programme relayed from Zagreb, 977 kc/s, 307 metres, 9.0, Time and News followed by Gigány Music relayed from the Patrosacka Zadruga Restaurant.

BERLIN

DEUTSCHLANDSENDER (REICHSENDER), 183.5 kc/s, 1,635 metres; 60 kW.—1.9 p.m., Gramophone Concert: So wie's früher war; Lieber Sonnenschein, grüss mir den Rhein; Mit dem Peng und dem Radiradibumbum; Marie-Luise (Meisel); Ich hab' so ein Gefühl als ob (Meisel); Bei der blonden Kathrein (Leux); Ich will nicht wissen wer du bist (Stolz); So eine Nacht wie heute (Stolz); Immer bin ich dein, Anita (Meisel); Mit dir, Erika (Holms-Devaly); Ein Lied aus Cuba (Stohart); Wild Violets (Stolz); In deine Hände (Kollo); Lieblich, du bist ein Mann mit Herz (Stolz), 2.0, Talk for Girls, 2.30, Weather and Exchange, 2.45, Reading (Lothar Schreyer), 3.0, See Leipzig, 4.0, Educational Talk, 4.25, Beethoven—Roger Concert by the Brunier Quartet: Sonata in E Minor for Pianoforte (Reger); String Quartet, No. 4 in C Minor, Op. 18 (Beethoven), 5.0, A Poem, 5.5, Readings (Herbert Reinhold), 5.25, Discussion between Heinrich Kömer and Dr. Friedrich Bubendey: Speaking before the Microphone, 5.45, Weather and News, 6.0, Transmission for all German Stations, relayed from Frankfurt, 7.0, Today's Motto, 7.5, Variety Programme, 7.50, Gramophone Concert: Selection from Tieland (d'Albert); Waltz, Nachtschwärmer (Zieheer); Espanita (Kroeger); Das träumende Schneeglöckchen (Oertel); The Native Land (Gretchaninov); Matinata (Leoncavallo); Russian Waltz (Mahler); Koketterie (Mahler); Hofballtänze (Lanner); Der Vögelin Abendlied (Derksen); Waltz, Sphärenklänge (Strauss); Erwachen der Frühling Blumen (Löhrl); Schatzwälder (Joh. Strauss); Narcissus (Nevin); Mia bella

(Sommerfeld); Russian Folk Song, Troika; Die Tänzerin (Sommerfeld), 9.0, News, 9.45, Weather, 10.0, Light Music from Breslau, 11.0 (approx.), Close Down.

BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—3.45 p.m., Concert by the Alfred Brox Orchestra, relayed from the Moka Etti at the Zoological Gardens: Overture, Banditenstreichle (Suppe); Serenade (de Micheli); Waltz, Sonnenstrahlen (Kark); Intermezzo from Cavalleria rusticana (Mascagni); Waltz, Liu (Amadei); Hungarian Dances Nos. 3 and 4 (Brahms); Humoresque (Dvorak); Koketterie (Siedle); Potpourri of Viennese Folk Music (Kozzak), 4.30, The Sister of a Genius—Radio Picture of Countess Wilhelmine von Bayreuth (Franz Konrad Hofer), 5.0, Light Music and Dance Music by the Willy Mettschke Band, relayed from the Haus Vaterland; Waltz, Liebeslieder (Joh. Strauss); Vermiss mein Lieb (Maebeth); Tango, Du bist die Frau für mich (Sorge); Tango, Der alte Lindenbaum (Kötcher); Song, Ja, du, du allein (Mory); Waltz, Es rauscht das Meer (Kauler); Stormy Weather (Koehler); The Clock is playing (Blaauw); Waltz, Lustiges Wien (Meisel), 5.30, The Funkstunde informs its Listeners, 5.45, Political Address, 6.0, Transmission for all German Stations, relayed from Frankfurt, 7.5, Up and down a German Street—Radio Picture (Meta Brix), 8.0, Concert by the Station Orchestra, conducted by Otto Frickehofer: Symphonic Prologue to Der Tor and der Tod (Reuss); Variations and Fugue on a Theme of Bach, Op. 81 (Reger), 9.0, Weather and News, 9.10 (approx.), Concert of Light Music by the Wilfrid Krüger Orchestra, relayed from the Traube Restaurant, In an interval at 10.0, Theatre and Film Review, 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—5.15 p.m., Pianoforte Recital by Ernest Krizan, 5.40,

tery Bells (Lefebvre-Wely); Intermezzo (Ippolitov-Ivanov); Tango (Albeniz); Symphonic Dances Nos. 1 and 2 (Grieg), 2.0, Agricultural Prices, 2.15, Programme for Young People, 2.40, Talk: Emity towards Germany in French School Books, 3.0, Concert by the Station Orchestra, conducted by Gerhard Ewald Rischka; Soloist, Hans Wesemann (Harmonium); Prelude to Hansel and Gretel (Humperdinck); Little Suite No. 3 (Schumann-Rischka); Viennese Dances (Beethoven); Imstruck, ich muss dich lassen (Isaak); Dance Song (Hasler); Gottes Edelknabe; Ein fein deutsch Liebeslied; Nachtlied; Ballet Music from Les Petites Riens (Mozart); Wächterlied; Alldentesches Scheydelied; Loreley (Liszt); Och-ennennett (Haydn); Bocoog (Schütt); Minnet (Gossec); Viennese Dance No. 1 (Gärtner), 4.30, Agricultural Prices, 4.35 (approx.), Gustav Schriber reads from his own works, 5.0, Talk: The Colonisation of Silesia, 5.25, Programme to be announced, 5.50, Market Prices, 6.0, Transmission for all German Stations, relayed from Frankfurt, 7.0, News, 7.10, Lists, Peasants!—Radio Sequence (arr. Gaertner), 8.0, Austrian Peasant Dances by the Station Orchestra, conducted by Ernst Prade, 9.0, Time and News, 9.25, Talk on the Riesengebirge, 9.45, Light Music and Dance Music, relayed from Niesse, 11.0 (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—3.0 p.m., Concert by the Station Orchestra, 3.55, Theatre Review, 4.5, See Prague, 5.5, Topical Talk, 5.15, Talk for Workers, 5.25, German Transmission: News, Sports Notes and Topical Talk, 6.0, See Prague, 6.25, Military Band Concert, 7.30, See Prague, 8.15, Ballet Suite for Orchestra (Glazunov) by the German Philharmonic Orchestra of Brno, relayed from the Stadium Concert Hall, 9.0, See Prague, 9.15 (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Wind and Rain—Gramophone Concert: Prelude to The Tempest (Honegger); Five Pieces (Debussy); (a) Ce qu'a vu le vent d'Ouest, (b) Dialogue du vent et de la mer, (c) Jardins sous la pluie, (d) Nuages, (e) Le vent dans la plaine; Zephyr (Hubay);

Bruges Chamber of Commerce: The National Market, 6.15, Request (Gramophone Records), 6.30, Items by Mine, Froidbise (Entertainer), 6.45, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Idomeno (Mozart); Adagio (Bach-De Boeck); Minnet (Beethoven); Violin Solo: Rondo (Mozart-Kreisler); Moment musical (Schubert), 7.15, Medical Talk, 7.30, Legal Talk and Literary Review, 8.0, Concert of Marches on Gramophone Records, 8.45, Talk: Ex-Servicemen and National Defence, 9.0, Dance Music for Young People, 10.0, Le Journal Parle, 10.10, La Brabantonne.

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans: French Military March (Saint-Saens); Waltz, Fin de siècle (Waldteufel); Ballet from Les deux pigeons (Messager); The Musical Snuff-Box (Nicolajewsky); Selection from Eine einzige Nacht (Stolz); Violin Solo: Habanera (Sarasate); Gavotte, Au village (Gillet); Slow Waltz, Dorothy (Mirrio); Selection from Dédé (Christiné), 1.0, Le Journal Parle, 1.10, Gramophone Concert, 5.0, Dance Music, relayed from the St. Sauveur Dance Hall, 6.15, Book Review, 6.30, Gramophone Concert: Concerto in C Minor (Rachmaninov); Piece (Schumann); Barcarolle (Tchaikovsky); Valse ergole (Tchaikovsky); Jazz Music (Poot), 7.30, Wireless Notes, 8.0, Chamber Music by the Zimmer Quartet: Quartet in D, Op. 76 (Haydn); Suite, Op. 35, for String Quartet (Glazunov), 8.45, Recitations, 9.0, Concert by the Radio Orchestra, conducted by André, Soloist: Boyarin (Guitar and Songs), Kamarinskaya (Glinka); Violin Solo: Zigeunerweisen (Sarasate); Selection from The Love Parade (Scherztänzer); Boyarin in his Repertoire; Juejos (Turina); Piece for Trumpet and Pianoforte; Petit Trianon (d'Agroves); Melody (Wangermée); Scherzo from A Midsummer Night's Dream (Mendelssohn), 10.0, Le Journal Parle.

BUCAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra: March from Idomeno (Mozart); Waltz No. 1 (Dvorak); Selection from Francesca da Rimini (Zandonai); Fantasia on Themes of Beethoven (Urbach); Selection from Der Zigeunerprimas (Kálmán); Rustic Dance (Zanella); Scherzino (d'Ambrosio); Abendmusik (Poester), In an interval at 5.0, Radio Journal, 6.0, Reading, 6.20, Educational Talk, 6.40, Mannon Opera (Massenet), on Gramophone Records, In the intervals, Radio Journal, After the Opera, Light Music, relayed from a Restaurant.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 6.45 p.m. till Close Down.—4.30 p.m., Pianoforte Recital by Agnes Janbor, 5.0, Shortland Lesson, 5.30, Concert by the Workers' Choir, 6.15, Readings, 6.45, Military Band Concert, conducted by Friesay, 8.0, Review of Foreign Politics, 8.15, Concert by the Waldbauer Kerpely String Quartet; Soloist, Ernst Dolmányi (Pianoforte); String Quartet in E Minor, Op. 18, No. 4 (Beethoven); Pianoforte Quintet (Schumann), 9.15, News, 9.30, Gramophone Records of Marcel Jouriet; La Marseillaise (de L'Isle); Aria from The Valkyrie (Wagner); Aria from Le jongleur de Notre Dame (Massenet); Aria from Les Huguenots (Meyerbeer); Aria from Faust (Gounod); The Two Grenadiers (Schumann), 10.10, The Alexander Brada Giganý Band, from the Hotel Metropole.

CASSEL.—See Frankfurt.

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time and Chimes from the Town Hall, 11.2, Concert by the Bendix String Ensemble, relayed from the Wivex Restaurant, 1.0 p.m., Interval, 2.0, Dance Music by Louis Freil's Instrumental Ensemble, with Songs by Ellen Lauritzen, 4.0, Reading in German, 4.30, Exchange and Fish Market Prices, 4.45, Talk: Students of Today, 5.15, German Lesson, 5.45, Weather, 5.54, Announcements, 6.0, News, 6.15, Time Signal, 6.30, Political Review of the Last Month, 7.0, Time Signal, 7.2, Programme by Per Knutzon, 7.10, Concert by the Danish Male Voice Quartet: Du danske Mand (Nielsen); Danish Folk Song (arr. Hartmann); Imelin Rose (Henriques); Song (Heise), 7.30, The Striped Carpet—Radio Play in Two Acts (Bergerström), 7.55, suite in C for Cello (Bach), played by Louis Jensen, 8.20, The Shooting Star—Radio Play in Two Scenes (Jørgensen), 9.5, News, 9.20, Concert by the Eufonia Mandoline Band, conducted by Castor Petersen; Mazurka (Ganne); Romanzetta (Tosti); Spanish Dance No. 3 (Moszkowski); In a Persian Market (Kettelby); Frühlingserwachen (E. Bach); Parade of the Tin Soldiers (Jessel), 9.50, Close Down.

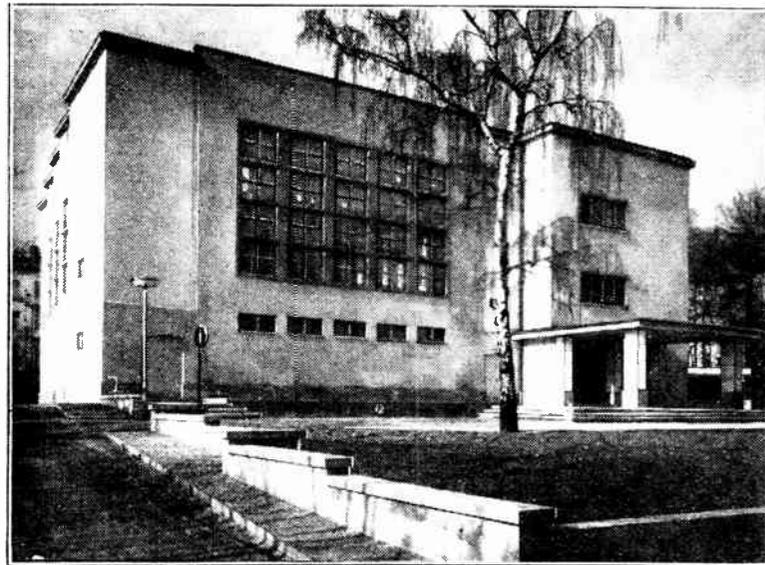
CORK.—See Athlone.

CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Miscellaneous Announcements, 6.25, See Warsaw, 6.40, Programme Announcement, 6.45 till Close Down, See Warsaw, 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.



Built specially for broadcasting purposes, the new "Radio House" at Frankfurt-am-Main is, as the photograph shows, one of the most striking buildings of its kind in Europe.

Lesson in Morse, 5.55, Hints for Housewives, 6.0, See Prague, 6.25, See Brno, 9.0, See Prague, 9.15 (approx.), Close Down.

BREMEN.—See Hamburg.

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.5 p.m., Gramophone Concert of Classical Music, 12.45, Time and News, 1.10, Contralto Song Recital by Käthe Kühnel: Songs (Franz); (a) Aus meinen grossen Schmerzen, (b) Gute Nacht, die Hühn und Wälder, (c) Für Maria, (d) Die Heide ist braun, (e) Ständchen, Songs (Brahms); (a) Die Sonne scheint nicht mehr, (b) Feinsliebchen, (c) Waldleinsamkeit, (d) Sommerabend, (e) Auf dem See, 1.35, Gramophone Concert: Song of the Volga Boatmen; Prelude (Rachmaninov); Monas-

The Wedding of the Wind (Hall); Brise argentine (Daquin); Polka, Gouttes d'eau (Petit); Raindrops (de la Riviere); Selection from The Song of the Drum (Ellis and Fieck), 1.0 p.m., Le Journal Parle, 1.10, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Tutti in Maschera (Pedrotti); Waltz, Traumdeale (Fieck); Potpourri of Italian Songs (de Micheli); Pianoforte Solo: Waltz (Chopin); Dances from The Bartered Bride (Smetana); Serenade (Jacobs); One-Step, Ninon (Morotti), 5.0, Concert by the Radio Orchestra, conducted by Frau André: One-Step (Worthy); Overture to a Revue (Wangermée); Gavotte, La Vallière (d'Agroves); Stormy Weather; Romanze (Svendson); Potpourri (Salabert); Tango (Borchert); Foxtrot (Bastia); Potpourri, In the Ardennes (Aveau), 6.0, Talk by the President of the

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m., till 12 Noon, Programme in English by the I.B.C. Happy Hour: Part 1: Signature Tune; Sous les Toits de Paris (Moretti); Russian Rhapsody (Nussbaum); Xylophone Solo: Hornpipe (Rosse); Selection from Princess Pat; Waltz, Zigeunerweisen (Boraganov); Your Song of Paradise; Xylophone Solo: Fiddlesticks (Robbins); Intermezzo Selection (arr. Ancelle); Part II: Dance Music; Julian; Avalon; In Memory of You; Nobody's Sweetheart; Under a Blanket of Blue; Tick-Tock; Love is the Thing; My Lucky Day; Signature. 12 Noon, Programme in French. 4.30-6.0, Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Concert for Southampton and Winchester: Signature Tune, The Night by the Sea; Washington Post March (Souza); Hobomoko (Reeves); Wiegeliend (Brahms); Praeludium (Jarnfeldt); Selection from The Geisla (Jones); Valse triste (Sibelius); Highland Fling (Traditional); Sailor's Hornpipe (Traditional); Old Panama (Alford). 5.30, Octet Concert for Bourneouth and Weymouth: Sans-Souci (von Blon); Humoresque (Dvorak); Twilight on the Waters (Squire); The Grasshoppers' Dance (Bucalossi); Serenade in C (Tchaikovsky); Godivog's Cake Walk (Debussy); Hindu Song (Rimsky-Korsakov); Romance (Rubinstein); Signature Tune. 6.0, Programme in French. 10.0 (approx.) till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune, Bells of Normandy; Lazybones; P.C. 123 (The Policeman's Song); At the Old Pig and Whistle; It was a Night in June; Oh! Johanna; It's Sunday down in Caroline; A woman should stick to her Man; Happy Ending; Goodnight but not Goodbye; There's a Cabin in the Pines; I raised my Hat; In Santa Lucia; Learn to croon; Adorable; Down the Old Ox Road; Let's call it a Day; Signature Tune. 11.0, Tunes from the Talkies: Signature Tune, Sittin' in the Dark; Selection from The Love Parade (Scherzinger); But for you (Hollander); I want to cling to Ivy; Maurice Chevalier Selection; There's Magic in the Air; The Moment I saw you (Gay); Cuban Love Song (Fields); Selection from The King of Jazz (Whiteman); Signature Tune. 11.30, Club Concert for Lichfield Listeners: Signature Tune, The Chum Song; Cathedral Bells (Lindahl); Serenade (Pierne); Down in the Forest (Landon Ronald); Autumn (Chaminade); Violin Solo: Air on the G String (Bach); Ich liebe dich (Grieg); Salut d'amour (Elgar); Prelude to "Carmen" (Bizet). 12.5 a.m., Late News Bulletin in English. 12.10 (approx.), Club Concert, Part II: Tea for Two (Youmans); Heaven for Two (Pepper); Beautiful Lady (Caryl); Trees (Rasbach); When Work is Through (Sherman); Signature Tune. 12.30, Dance Music by Jay Wilbur and his Band (Electrical Transcriptions): I've got the World on a String; One Tiny Tear; Stormy Weather; I shall still keep smiling along; Goodnight but not Goodbye; And so I married the Girl; Put a Little Springtime; Her Name is Mary; This is no Dream; Hyde Park Corner. 1.0, Dance Music: Signature Tune, Bells of Normandy; Sylvia; Sundown in a Little Green Hollow; From me to you; Lover; Sweet Dreams Pretty Lady; Someone stole Gabriel's Horn; Meet me in the Gloaming; Isn't it Heavenly?; Maybe I love you too much; Waiters on Parade; My Wishing Song; You did Everything for me; Bugle Call Rag; Look what I've got; Come out Vienna; In the Park in Patee; Dance Pretty Lady; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

**FLENSBURG.**—See Hamburg.
**FLORENCE.**—See Turin.
**FRANKFURT**
1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, 1,220 kc/s, 245.9 metres; and Trier, 1,157 kc/s, 259.3 metres.—3.0 p.m., Concert. 5.0 to 5.35, See Langenberg. 5.35, Wolf Brockmeier reads his own Poems. 5.50, News. 6.0, Transmission for all German Stations: Symphony No. 2 in C minor (Bruckner), by the Station Orchestra, conducted by Hans Rosbaud. 7.0, Topical Talk. 7.10 to 9.0, See Stuttgart. 9.0, Time and News. 9.20, See Stuttgart. 9.30, News. 9.45, Light Music. 10.0 to 11.0, Serenade. 11.15 (also relayed on Zeesen, 31.38 metres), Talk: The German Spirit. 11.45 (approx.), Close Down.
**FREDRIKSSTAD.**—See Oslo.
**FREIBURG.**—See Stuttgart.
**GENEVA.**—See Radio-Suisse Romande.
**GENOA.**—See Turin.
**GLEIWITZ.**—See Breslau.
**GOTEBORG.**—See Stockholm.
**GRAZ.**—See Vienna.
**HAMAR.**—See Oslo.

HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hannover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—5.0 p.m., Concert by the Hamburg Philharmonic Orchestra, conducted by José Eibenschütz: Soloist: Jan Gesterkamp (Violin); Overture, Leonora No. 3 (Beethoven);

OCT. 13th FRIDAY continued

Turkish March (Mozart); Violin Solos: (a) Romance (Svendsen), (b) Scenes from the Czardas (Hubay); Bacchanal from Taunhäuser (Wagner). 6.45, Frankfurt Exchange and Hamburg Market Prices. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, Der Soldat ohne Waffe—Radio Sequence (Ernst Löns and Eberhard Moes) with Music by the Small Station Orchestra, conducted by Gerhard Maasz. 8.0, German Folk Dance Music by the Station Choir and Small Station Orchestra: Conductor: Gerhard Maasz; Soloist: Bernhard Jakschitz (Songs). 9.0, Time and News. 9.30, Pianoforte Recital by Wolfgang Hattenbach: Polonaise in E flat minor (Chopin); Variations on Sehnsuchts-Walzer (Schubert-Liszt); Minuet from the Suite bergamasque (Debussy); Mephisto-Walzer (Liszt). 10.0, Concert by the Hamburg Philharmonic Orchestra, conducted by Adolf Secker: Overture, Figaro (Mozart); Scherzo and Finale from the Symphony in C (Schubert); Waltz from Faust (Gounod); Suite No. 1 from L'Arlesienne (Bizet); Overture, The Flying Dutchman (Wagner).

**HANOVER.**—See Hamburg.

HEILSBURG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert of Operetta Music. In the interval at 1.0, News. 1.30, Programme arranged by the Post Office with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.15, Programme for Children. 2.40, Talk for Women. 3.0, Military Band Concert, conducted by Hans Ohlhorst: March, O Deutschland hoch in Ehren (Rockling); Overture, Frieridiana (Zimmer); Historical March, Potpourri (Kaiser); Singende Bataillone (Rohrecht); Parademarsch der langen Kerls (Roland); Regimental March, Preussens Gloria (Piefke); Tone Poem, Soldatenleben (Keler-Bela); Der Tag von Potsdam (Schmalstich); Erinnerung an 1970—71 (Saro). In an interval at 4.0 (approx.), Book Review. 4.45, Talk on Hunting. 5.15, Agricultural Prices. 5.25 (from Danzig), Max Hahle reads from his own Works. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, Weather and News. 7.10, Symphony Concert by the Königsberg Opera House Orchestra and the Station Choir, relayed from the Stadthalle. Conductor: Erich Seidler. Soloist: Marta Fucis (Songs). Patriotic Overture (Reger); Songs (Reger): (a) An die Hoffnung, (b) Requiem; Halleluja (Mozart); Symphony in C—the Jupiter (Mozart). 9.0, News and German Dance Music.

HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m. and 20 kW. from 5.40 p.m.—7.40-9.40 a.m., Programme of the Workers' Radio Society (V.A.R.A.) Gramophone Music. 9.40, Religious Programme of the Liberal Protestant Radio Society (V.P.R.O.). 9.55-11.40, Programme of the V.A.R.A. 9.55, Gramophone Music. 10.25, Song and Pianoforte Recital. 10.40, Gastronomic Talk. 11.10, Concert (contd.). 11.25, Organ Recital; Selection from The Seasons (Tchaikovsky); Song of the Flag (Zetten). 11.40-3.40 p.m., Programme of the Allgemeine Vereeniging Radio Omroep (A.V.R.O.). 11.40, Concert of Light Music Gramophone Music in the interval. 1.55 Gramophone Music. 2.10, Talk: Education and Psychology. 2.40, Gramophone Music. 3.40-7.40, Programme of the V.A.R.A. 3.40, Gramophone Music. 4.30, Programme for Children. 5.10, Concert by the Amsterdam Orchestral Society, conducted by Diepenbeek: The Amsterdam Flag (Ripken); Overture, Athalie (Mendelssohn); Du und du (Strauss); Herzwunden (Grieg); Letzter Frühling (Grieg); Down South (Myddleton). 5.42, Gramophone Music. 5.55, Concert (contd.): March russe (Ganne); Second Suite from L'Arlesienne (Bizet). 6.20, Talk on Fascism. 6.40, Concert (contd.): Wedding March (Mendelssohn); Die Schmiede im Walde (Michaelis); Adagio cantabile (Beethoven); Selection from La Gioconda (Ponchielli). 7.10, Gramophone Music. 7.20, Concert (contd.): Hungarian Comedy Overture (Keler-Bela); Vic la danse (Waldteufel); March (Kühne). 7.40-10.40, Programme of the V.P.R.O. 7.40, Talk. 8.10, 'Cello and Pianoforte Recital: Sonata in F (Fleisch); Sonata in C, No. 2 (Boccherini). 8.40, Talk: Questions of the Time. 9.10, Concert (contd.): Song (Labey); Ballade des caravanes (Delune); Nuit calme (Bosmans); Harlequin (Popper). 9.40, News. 9.55, Talk. 10.25, Gramophone Music. 10.40 till Close Down, Programme of the V.A.R.A. 10.40, Organ Recital: Rio Rita (Santeugini); Until (Somers); Wir kurbeln an (Dostal); Parlez moi d'amour (Lenoir); Stormy Weather (Arlen); Melody (Wrubel). 11.10, Gramophone Music.

**HORBY.**—See Stockholm.

HUIZEN

160 kc/s, 1,875 metres; 7 kW. (until 3.40 p.m.). Transmitted from Kootwijk on 50

kW. from 3.40 p.m. Programme of the Christian Radio Society (N.C.R.V.).—10.40 a.m., Concert by the Van der Horst Ensemble: Overture, La dame blanche (Boieldieu); Tout Paris (Waldteufel); Selection from La Mascotte (Audran); Gramophone Music: Selection from William Tell (Rossini); Extracts from Manon Lescaut (Puccini). 1.40, Police Notes. 1.55, Gramophone Music. 12.10 p.m., Concert (contd.): Overture, Nakirins Hochzeit (Lincke); Waltz, Seid umschlingen, Millionen (Strauss); Offenbach Potpourri (Fétras); Schubert Potpourri (Urbach). 12.55, Pianoforte Recital by Rooth: Rhapsody in G minor, Op. 79, No. 2 (Brahms); Variations sérieuses, Op. 54 (Mendelssohn); Fantasia in F minor, Op. 49 (Chopin); Chromatic Waltz, Op. 88 (Godard); Hungarian Rhapsody No. 12 (Liszt). 1.40-2.10, Interval. 2.10, Religious Reading. 2.40, Organ Recital by Mlle. Van de Vlies: Concerto in G (Bach); Sonata No. 3 (Mendelssohn); Three Pieces (Brahms): (a) Herzlich tut mich erfreuen, (b) O wie selig seid ihr doch, ihr Frommen, (c) Es ist ein Ros' entsprungen; Four Fantasies (van de Vlies) Pastorale (Franck); Allegro appassionato (Guilmant). 3.40, Concert by Mlle. Ilermes (Contralto), Bethis (Violin), and Ialsanea (Pianoforte): Pianoforte Solo: Variations (Mozart); Contralto Solos: (a) Se tu della mia morte (Scarlatti), (b) E ingrato, il Vecchio (Galuppi), (c) Chi vuol la enigarilla (Paisillo); Violin and Pianoforte Duets: Romances in G and F (Beethoven); Contralto Solos: (a) Busslied (Beethoven), (b) Bitten (Beethoven); Gramophone Music: Contralto Songs (Schubert): (a) Klärchens Lied, (b) An die Leier, (c) Im Hain; Violin Solos: (a) Melody (Kreisler), (b) La Gitana (Kreisler), (c) Short Story (Gershwin); Contralto Solos: (a) 't is de mandel (Mortelmans), (b) Ons Hoveken (de Klerk), (c) Song (Wagenaar); Gramophone Music: Suite for Violin and Pianoforte, Tallahassee (Cyril Scott); Pianoforte Solo: Sonatina (Ravel). 5.40, Gramophone Music. 6.10, Horticultural Talk. 6.40, Police Notes. 6.55, Religious News. 7.10, Literary Talk. 7.40, Concert by the Small N.C.R.V. Orchestra: Soloist: Heimerik ('Cello); Sacred Song Fantasia; 'Cello (Concerto in D (Boccherini); Adagio (Leken); Wacht auf (Bach); Was Gott tut, das ist wohlgetan (Bach); 'Cello and Orchestra: Concertino (Weil); Cycle of Sacred Songs for Chamber Orchestra (Gordon); Overture, The Bohemian Girl (Balfe); Moonlight on the Alster (Fetras); Selection from The Gipsy Baron (Strauss); La Mattinata (Leucavallo); Wien bleibt Wien (Schrammel); Tempo, tempo (Schootemeyer); March from Faust (Gounod). In the interval at 8.40, Recitations, and at 9.40, News. 10.40, Gramophone Music. 11.10 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

LAHTI

167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—6.5 (from Helsinki), Concert by the Helsinki Municipal Orchestra, conducted by Ottorino Respighi. Soloist: Bernhard (Pianoforte). Antiche arie ed danze (Respighi); Melody (Caroso); Rustic Dance (Besardo); Campanae Parisienses (Anon); Air (Marin); Bergamasque (Gionocelli); Pianoforte Concerto in the Molydian Mode (Bernhard); Three Pieces (Respighi): (a) Mattutino di Santa Chiara, (b) Vetrate de chiesa, (c) I Pini di Rome. 7.45, News in Finnish and Swedish.

LANGENBERG

635 kc/s, 473 metres; 60 kW.—12.35 p.m., Concert of Unfamiliar Johann Strauss Music by the Station Orchestra, conducted by Kühn: Overture, Reiche Mädchen; Jubel-Walzer; Gavotte der Königin; Mazurka; Rosige Laune; Traumbild; Intermezzo from Cinderella; Mazurka, Liebe und Ehre; Polka Blütz und Donner. 1.30, Talk: Italian and German Town-Planning compared and contrasted. 1.45, Reading of New German Lyrics. 2.5, A Discussion on the Middle Classes between Adolf Hitler and the Author, Hanns Johst. 2.30, Economic Notes. 2.50, Topical Talk. 3.0, See Frankfurt. 5.0, English Lesson. 5.20, Talk: The History of German Surnames. 5.35, Talk: The Bonn Institute of Archaeological Research. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, See Frankfurt. 7.10 to 9.0, See Stuttgart. 9.0, News and Weather. 9.45 till Close Down. See Frankfurt. 1.0 a.m. (Saturday), Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

LEIPZIG

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—12.30 p.m., Concert of Schrammel Music. 1.15,

News. 1.30, Art Review. 1.40, Gramophone Concert of Variety Music. 2.15, Talk for Peasants. 2.35, Economic Notes. 3.0, Concert by the Station Orchestra, conducted by Hilmar Weber; Soloist, Erich Kindscher (Violin); Overture, Jewsonda (Spohr); Fantasia for Violin and Orchestra (Schumann); Suite No. 1 in D Minor (Ambrosius); Spanish Caprice (Rimsky-Korsakov); Overture, Das Nachtlager von Granada (Kreutzer); Selection from Djamilah (Bizet); Triumphant March from Aida (Verdi). 4.30, Topical Talk. 4.50, Economic Notes, Weather and Time. 5.0, Book Review. 5.20, Talk: Old Scandinavian Gravestones. 5.40, Reading of Lyrics (Gogolay von Selchow). 5.50, Today's News. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, Das Spiel vom Frohnauer Hammer—Play for Workers (Hans Reih). 8.0, Guitarr Recital of Spanish Music by Miguel Llobet: Andantino (Sor); Etude (Sor); Suite (Vissee); Two Mexican Songs (Ponce); Two Catalonian Folk Songs (Llobet); Alhambra (Tarrega). 8.30, Reading: Friesennot (Werner Kortnig). 9.0, News. 9.30, Talk: Racial Types. 10.0, Concert Relay. 11.0 (approx.), Close Down.

**LINZ.**—See Vienna.

LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Programme for Sokols. 6.30, Tourist Talk. 7.0, Programme relayed from Zagreb. 977 kc/s, 307 metres. 9.0, Weather and News. 9.15, Dance Music by the Radio Jazz Band. 10.0 (approx.), Close Down.

LUXEMBOURG

252 kc/s, 1,191 metres; 200 kW.—Dutch Evening. 7.30 p.m., Gramophone Concert of Dutch Music. 8.20, Pianoforte Recital by Théo Potjes. 8.50, News in French. 9.0, Musical Potpourri by Auguste Donnem, Oscar Dammer, André Cassedanne, Otto Müller and Mark Braun. 9.50, News in German. 10.0, Trio in E flat, Op. 1 (Beethoven), by René Delporte, Ernest Eichel and Léon Van Ekhout. 10.25, Dance Music by the Station Jazz Band, conducted by Ferry Jusa.

LYONS

**LA DOUA,** 644 kc/s, 465.8 metres; 1.5 kW.—7.30, Radio Gazette for Lyons and the South-east. 8.30, Programme relayed from the Salle Mollière. News after the Programme.

MADRID

**ARANJUEZ (EAQ),** 9,860 kc/s, 30.43 metres; 20 kW.—10.30 p.m., Concert of Variety Music. In the interval at 10.45, Radio Chronicle. 11.35, Answers to Correspondence. 11.40, Spanish-American Talk. 11.45, Light Music. 12.0 Midnight till Close Down, Programme in English by the I.B.C. 12.0, Concert: Kalima Waltz; The old Blind Man; Rosa del Rio; Yes, Mr. Brown; I am so anxious, dear; The Skaters; Secret; Aloha Oe. 12.30 a.m. (Saturday), I.B.C. Goodnight Melody and Close Down. **MALMO.**—See Stockholm. **MILAN.**—See Turin.

MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—5.5 p.m., Tourist Report. 6.15, See Prague. 6.25, See Brno. 7.30, See Prague. 8.15, See Brno. 9.0, See Prague. 9.15 (approx.), Close Down.

MOSCOW

**TRADES UNION,** 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m. and 1.45 p.m., News. 2.0, Two Plays: (a) The Flea (Smiatin), with Music by Oransky, (b) Le donne curiose (Goldoni); with Music by Wlassow and N. Rachmanov. 3.0, German Lesson. 3.30, Dramatic Programme. 4.30, Talk on the U.S.S.R. 8.0, News. 8.30, Programme Announcements. 8.55, Time Signal. 9.5, Press Review. 10.0, Weather. **MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Concert by the Station Orchestra, conducted by Karl List: Overture, Figaro (Mozart); Waltz (Tchaikovsky); Fest auf Monbijou (Wunsch); Aheidfrieden (Ehrenberg); Liebeswalzer (Reger); Capriccio (Piechler); Hungarian Rhapsody No. 2 (Liszt). 4.45, Talk for the Younger Generation. 5.5, Harspichord Recital of Seventeenth Century Bavarian Music. 5.25, Instrumental Music of the Korea—Dialogue with Gramophone Illustrations. 5.45, Time and News. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0 (from Nürnberg), From Reveille to Lights Out—Radio Report of a Day in a Barracks. 7.50, Concert by the Small Station Orchestra, conducted by Erich Kloss: Overture, Boccaccio (Suppé); Airs (Tchaikovsky): (a) Song without Words in F, (b) Melody, (c) Song without Words; Ballet Suite, Faun und Elfenreigen (Kark); Swabian Peasant Waltz (Krome); The Forge in the Forest (Michaelis); The Phantom Brigade (Mlydleton). In an interval, Political Announcements. 9.0, Time and News.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

OCT. 13th **FRIDAY** continued

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Mamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Concert by the Radio Ensemble relayed from Bergen. 5.0, French Lesson. 5.30, Norwegian Music. 6.0, News. 6.30, English Lesson. 7.0, Time Signal. 7.2, Symphony Concert by the Philharmonic Orchestra, conducted by Olav Kieldand relayed from the Logen Hall. 8.30, Agricultural Market Prices. 8.40, News. 9.0, Topical Talk. 9.15, Humorous Monologues. 9.45, (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Announcements, Tourist Talk, Agricultural Report, Report of the Royal Geographical Society and Giornale Radio. 7.20, Gramophone Music. 7.30, Time and Announcements. 7.45, Concert of Opera Music, conducted by Fortunato Russo.

**PARIS**

**POSTE PARISIEN**, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Music: Nocturne (Faure); Adagio cantabile (Nardini). 7.15, Le Journal Parle. 7.30, Gramophone Concert of Symphonic Dances: Dances (Lullu); Oriental Dance (Glazunov); Hungarian Dance No. 5 (Brahms); Danse macabre (Saint-Saëns); Danse profane (Debussy). 7.50, Talk. 7.55, Agricultural Talk. 8.0, Talk on Music. 8.30, The Nuremberg Doll—One-Act Opera-Comique (Adam), and Tromb at Cazar—One-Act Opera (Offenbach). 10.30, News.

**PARIS**

**RADIO PARIS**, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m., Weather and Physical Culture. 7.45, Gramophone Records: Gipsy Romance (Boldi); Czardas (Monti); Romanian Dance (Bela Bartok); Gipsy Romance. 8.0, Weather and Press Review. 12 Noon, Jewish Address. 12.30 p.m., Spain in Music—Gramophone Concert: Iberia (Albeniz); Spanish Dance No. 6 (Graudalos); Selection from La vida breve (Falla); Spanish Serenade (Borodin); Spanish Caprice (Rimsky-Korsakov); La Feria (Lacôme); Seguidilla from Carmen (Bizet); Espana (Chabrier); La Soirée dans Grenade (Debussy); Prelude to La Habanera (Laparra); Spanish Rhapsody (Ravel). In the interval at 1.0, Exchange, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market. 6.30, Agricultural Talk. 6.50, Book Review. 7.0, Dialogue between Frédéric Lefèvre and J. R. Blach: Romantics or Classics? 7.10, Insurance Companies' Report. 7.20, Chabrier Concert on Gramophone Records: Overture to Gwendoline; Scherzo-Valse; L'île Heureuse; Habanera; Les Cigales; Fête Polonoise from Le Roi malgré lui. 7.50, Commercial Prices and News. 8.0, Reading. 8.15, Rigoletto—Opera (Verdi) on Gramophone Records. In the interval at 8.30, Gastronomic Review, and at 9.25, Press Review and News.

**PITTSBURGH**

**KDKA**, 980 kc/s, 306 metres; 50 kW. Relayed by **W2XK** on 48.85 metres and 25.27 metres.—8.0 p.m., Programme to be announced. 8.15, Utility Hall, from New York. 8.30, Popular Programme. 8.35, Pat Italy. 8.45, Morin Sisters, from New York. 9.0, Betty and Bob, from New York. 9.15, (cont.) Quaw's Orchestra. 9.30, News and Markets. 9.45, Arcadians, from New York. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies Klub. 10.30, The Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, Press News. Reeler. 11.15, Sports; A Song. 11.30, Pittsburgh Spotlights. 11.45, Lowell Thomas, from New York. 12 Midnight, Amos 'n' Andy, from New York. 12.15 a.m. (Saturday), Silver-toppers. 12.30 to 3.30, New York Relay. 12.30, String Symphony. 1.0, Popular Programme. 1.30, Potash and Perimutter. 1.45, Red Davis. 2.0, Let's Listen to Harris. 2.30, Popular Programme. 3.0, First Nighter.

**PORSGRUND.**—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Brno. 3.55, Talk: The Napoleonic Congress in Prague. 4.5, Concert by the Ondricek Quartet: String Quartet in C, Op. 33, No. 3 (Haydn); Pianoforte Quartet in D, Op. 23 (Dvorák). 5.5, Agricultural Talk and Prices. 6.15, Talk for Workers. 6.25, News in German. 6.30, German Transmission: Talk on Wireless. 6.0, Time and News. 6.10, Topical Talk. 6.25, See Brno. 7.30, Concert by the Gotham Teachers' Vocal Union. 8.15, See Brno. 9.0, Time and News. 9.15 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**SOTTENS**, 743 kc/s, 403 metres; 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne). Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Concert by the Small Radio

Lausanne Orchestra, conducted by Moser. 12 Noon (from Lausanne), Financial News. 12.10 p.m. (from Lausanne), (concert (contd.). 1.0 to 2.0, Interval. 2.0 (from Geneva), Cooking Lesson relayed from the Exhibition at the Kursaal. 2.28, Time Signal from Neuchâtel Observatory. 2.30 (from Geneva), Gramophone Concert. 3.30, (from Geneva), Programme for Women. 4.30 to 6.0, Interval. 6.0 (from Lausanne), Talk on the French Writer Paul Valéry. 6.25 (from Lausanne), Announcements, Sports Notes and Weather. 6.30 (from Lausanne), Answers to Correspondence. 7.0 (from Geneva), Lapschichold Recital of Old Music. 7.15 (from Geneva), Talk. 7.30, (from Geneva), Talk and Demonstration on Neo-Bachstein Electrical Pianoforte, relayed from the Exhibition at the Kursaal. 7.50 (from Geneva), Variety Programme relayed from the Exhibition. The Melody Dance Band, conducted by Pasche and Mlle. Assia de Bonzini (Songs). 8.50, News and Weather. 9.0 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

**REYKJAVIK**

250 kc/s, 1,200 metres; 21 kW.—8.5 p.m., Musical Programme. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, (Chimes and News. 9.30, Reading. 10.0, Quintet in B minor (Brahms) on Gramophone Records.

**RJUKAN.**—See Oslo.

**ROME**

Call **1RO**, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Yigentino), 662 kc/s, 453.2 metres from 7.15 p.m. (approx.), and **2RO**, 11,810 kc/s, 25.4 metres from 4.15 p.m. (approx.).—12 Noon to 1.15 p.m., Orchestral Concert. In the intervals from 12.30 to 12.45, Giornale Radio and Exchange, and at 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15 to 5.0, Vocal and Instrumental Concert: Germano Arnaldi (Pianoforte), Mario Cavasini (Tenor), Virginia Brunetti (Soprano); Pianoforte Solos: (a) Mariettes (Goossens), (b) Ritmi al marcia (Labroca); Tenor Solos: (a) Aria from Mignon (Thomas), (b) Aria from Madame Butterfly (Puccini); Soprano Solos: (a) Aria from Lodoletta (Mascagni), (b) Aria from Crispino e la comare (Ricci); Syncopated Pianoforte Music: (a) Black and White (Peri), (b) Hollywood Stars, (c) Kitten on the Keys (Cofrey); Duet for Soprano and Tenor from Lucia di Lammermoor (Donizetti). 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopolavoro Report and Tourist Information. 5.57, Report of the International Institute of Agriculture (Spanish, German and French). 6.10, Grain Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time, Announcements and Sports Notes. 7.15, Sponsored Music. 8.15, Il grafologo e la signora—Comedy in One Act (Cavachiocchi). 8.35, Song Recital by Gianna Perea Labia (Soprano); Arietta (Paneron); Hallelujah (Mozart); Variations on an Aria (Proch). 8.50 (approx.), Variety Programme. 10.0, Giornale Radio.

**SALZBURG.**—See Vienna.

**SCHENECTADY**

**WGY**, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on 31.48 metres and by **W2XAD** on 19.56 metres.—7.30 to 8.30 p.m. (approx.), New York Relay. 7.30, The Romancers. 7.45, Three Shades of Blue. 8.0, Sonata Recital. 8.15, Soloist. 12.45 a.m. (Saturday), Stock Reports. 1.0, Popular Concert, from New York. 1.30, Variety Programme. 2.0 to 4.0, New York Relay. 2.0, Fred Allen's Salad Bowl Revue. 2.30, Players. 3.0, First Nighters. 3.30, Lum and Abner's First Night Sociale. 4.0, Programme Résumé.

**SCHWEIZERISCHER LANDESENDER**

**BEROMUNSTER**, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 a.m. to 6.5 (from Berne), Gymnastics. 10.59, Time Signal from Neuchâtel Observatory. 11.0 (from Zürich), Concert of Light Music. In the interval at 11.30, Time, Weather and News. 12.25 p.m. (from Zürich), Time, Weather and Exchange. 12.40 (approx.) to 4.0, Interval. 4.0 (from Zürich), Programme for Children. 4.30 (from Zürich), Concert by the Small Station Orchestra, conducted by Scherbaum. 5.30 (from Berne), Programme to be announced. 6.0 (from Berne), Time, Weather, Exchange, Tourist Report and Sports Notes. 6.20 (from Berne), Programme to be announced. 8.0, Weather and News. 8.10 (from Berne), Programme to be announced. 9.15 (approx.), Close Down.

**SOTTENS.**—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg,

532 kc/s, 32 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—12.0 Noon to 12.30, Broadcast for Schools. 4.5 (from Boden), Accordion Music. 4.30 (from Göteborg), Talk: The Journalists' Conference at Geneva. 5.0, Gramophone Music. 5.40, Programme for the Blind. 6.15, Weather and News. 6.30, Legal Talk. 7.0, Negro Spirituals on Gramophone Records. 7.15, The Copper Wedding—Comedy in Four Acts (Rindom). 8.45, Weather and News. 9.0, Concert by the Station Orchestra: Soloist: Julius Rühström (Violin); Overture, Dido and Aeneas (Kraus); Violin Concerto No. 3 in G (Mozart); Pavane pour une Infante défunte (Ravel); Serenata (Casella). 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Concert of Classical Music. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Popular Music on Gramophone Records. 2.0, Interval. 4.45, Literary Talk. 5.0, Orchestral Concert, conducted by Roskani: Two Step, Manuela del Rio (Lucchesi); Minuet for Quintet (Scassola); Bruce Catharine (Weiss); Tango, Nuits de Ceylan (German); Fantasia, Titi (Szulc); Waltz (Erwin); Foxtrot, Going, going, gone (Baxter); Geburtstags-Ständchen (Lincke); Waltz and Foxtrot from Glück muss man haben (Profes); Tango (Sheridan-Lea); March, Uns kann keiner (Heymann). 6.0, Trio Concert, relayed from Lille, 1,130 kc/s, 265.4 metres. 7.0, Topical Talk in German. 7.15, Tourist Talk. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German. Lottery Results and Announcements. 8.30, Concert by the Station Orchestra, conducted by Maurice de Villers; Soloists, Inès Maujan and Jean Wild (Songs); Overture, Carnaval romain (Berlioz); Song and Orchestra: Poèmes arabes (Aubert); Jeux d'enfants (Bizet); Song, Le pas sans nom (Aubert); Duets (Bretagne): (a) La source, (b) Les chèvres; Symphonic Poem, Sur la mer lointaine (Moreau); Songs: (a) Ella dance, (b) Elle chante; Duet, Réverie (Moreau); Ballet Music from Namouna (Lalo). In the interval at 9.30 (approx.), Press Review. 10.30 (approx.), Close Down.

**STUTTGART**

**MUHLACKER**, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.35 p.m., See Langenberg. 1.30, Interval. 2.0, Chamber Music by Hubert Giesen and Paul Schotte (Pianofortes): Sonata in D for Two Pianofortes (Mozart); Duet: Military March (Schubert). 3.0, See Frankfurt. 5.0 to 5.35, See Langenberg. 5.35, Medical Talk. 5.50, Time and Agricultural Notes. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, See Frankfurt. 7.10, Waldfrieden—One-Act Comedy (Thoma). 7.45, Swabian Folk Music—Recital by the Heinz Mönch Zither Trio and Soloists. 8.10, O du mein Wien!—Humorous Radio Sequence (Hanns Rösler). 8.40 (from Mannheim), Song and Ballad Recital by Heinrich Hölzlin (Bass); Songs (Schubert): (a) Der Doppelgänger, (b) Im Frühling; Songs (Liszt): (a) Es muss ein Wunderbares sein, (b) Ueber allen Gipfeln; Songs (Löwe): (a) Meeressleuchten, (b) Das Hochzeitslied. 9.0, See Frankfurt. 9.20, Talk: Things you should know... 9.30, News. 9.45 till Close Down, See Frankfurt. 11.45 (approx.), Close Down.

**SUNDSVALL.**—See Stockholm.

**TOULOUSE**

**RADIOPHONIE DU MIDI**, 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Accordion Music. 6.30, Light Music. 6.45, Quartet in E Flat (Schubert). 7.0, Russian Songs. 7.15, News. 7.30, Orchestral Concert of Light Music. 7.45, Light Music. 8.0, Music by a Viennese Orchestra. 8.15, Opera Music: Romance from Tannhäuser (Wagner); Song from The Tales of Hoffmann (Offenbach); Extract from Prince Igor (Borodin); Extract from Faust (Gounod). 8.30, Military Band Music. 8.45, Music from Sound Films. 9.0, Beethoven Concert: Leonora Overture; Minuet in G; Melody; Larghetto from a Violin Concerto; Symphony No. 1. 9.45, Opera Music: Waltz from Mirella (Gounod); Aria from Lakmé (Delibes); Aria from Werther (Massenet); Toreador's Song from Carmen (Bizet). 10.0, Medical Talk. 10.5, Light Orchestral Music. 10.15, News. 10.30, Concert for Listeners in Morocco: Waltz, Im Zeichen des Frühlings (Lehár); Intermezzo (Ancliffe); Mes souvenirs (Clew); Nasalki (Brunest); Extract from L'attaque du moulin (Bruneau); Spring Song from The Valkyrie (Wagner); Selection from Hamlet (Thomas); Extract from Sigurd (Reyer). 11.0, Dance Music. 11.45, Light Music. 12 Midnight, News. 12.5 a.m. (Saturday), Music by a Viennese Orchestra. 12.15, Orchestral Music: Bourrée fantasque (Cha-

brier); Henzelmannleins Wachtparade (Noack); Schubert Potpourri (Berté). 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

**TRONDHEIM.**—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres, and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Concert of Chamber Music. 5.0 to 5.5, Weather. 5.40, (Giornale Radio, Dopolavoro Announcements and Gramophone Music. 6.0, Time, Report of the Royal Geographical Society and Gramophone Music. 6.10, Agricultural Talk and Market Reports. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio and Weather. 7.15, Sponsored Music. 7.30, Programme to be announced. In the interval, Talk. 9.0, Orchestral Concert, conducted by Tito Petralia. 10.0, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—11.0 to 11.15 a.m., Religious Information in German. 8.0 to 8.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,056 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,379 kc/s, 218.5 metres.—12.10 p.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer: Cadet March (Souza); Ballet Overture (Kremsner); Song, Heut' Nacht hab' ich von dir geträumt (Kálmán); Waltz, Wien, mein Sinn (Joh. Strauss); Gavotte, Lichtstrahlenbrunnen (Wetaschek); Idyll; Heimliche Liebe (Müllacker); Selection from The Land of Smiles (Lehár); March, Geh' ma mit (Sieczynski). 1.0, Interval. 2.0, Time and Announcements. 2.20, Hints for Housewives. 2.30, Literary Talk for Women: Karoline von Günderode. 2.55, Gramophone Concert of Opera Music: Overture, William Tell (Rossini); Pamina's Aria from The Magic Flute (Mozart); Waltz Scene from Intermezzo (R. Strauss); Aria from La Traviata (Verdi); Dance of the Seven Veils, from Salomé (R. Strauss). 3.35, Talk for Young People: Voluntary Labour Service for Young People. 4.0, Talk: How Modern Wireless Sets are Made. 4.25, Trio in A minor, Op. 114 (Brahms), for Pianoforte, Clarinet, and Cello. 5.5, Tourist Report. 5.20, Talk: The 1933 Rowing Season. 5.35, Sports Notes. 5.45, Talk: Class Distinctions in the Middle Ages. 6.10, Concert by the Strauss-Lanner Schrammel Quartet and Soloists. 6.50, Time and Announcements. 7.0, Der Vampyr—Opera in Two Acts (Marschner). In an interval at 8.30 (approx.), Announcements. 10.0, News and Announcements. 10.15, Gramophone Concert of Light Music, followed by Announcements.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Quintet Concert. In an interval at 11.30, Radio Journal and Weather. 12 Noon, Interval. 2.30, Economic Notes. 2.40, News. 2.45, Scout Report. 2.50, Maritime and Colonial Notes. 2.55, Dance Music on Gramophone Records. 3.40, Book Review. 3.55, Soprano and Baritone Recital by Poliuska-Lewicka and Czapliski: Soprano Solos (Purcell): (a) Melancholy, (b) Fantasia, (c) When I laid in earth; Soprano Solos (Schubert): (a) Du bist die Ruh!, (b) Herberge, (c) Gretchen am Spinnrad; Baritone Solos: Arias from (a) Le roi de Lahore (Massenet), (b) Hamlet (Thomas), (c) Halka (Moniuszko); Soprano Solos: Arias from (a) Figaro (Mozart), (b) The Magic Flute (Mozart), (c) Norma (Bellini), (d) L'Africaine (Meyerbeer); Baritone Solos: (a) Mon âme est triste (Gadejski), (b) Si j'étais plus jeune (Galli); (c) To Granada (Alvarez). 4.50, Agricultural Notes. 5.0, Talk relayed from Wilno, 533 kc/s, 563 metres. 5.20, Light Music relayed from the Café Gastronomica. 6.5, Talk. 6.25, Reading. 6.40, Programme Announcements. 6.45, Radio Journal. 6.55, Interval. 7.0, Talk on Music. 7.15, Concert by the Philharmonic Orchestra, conducted by Fiteberg: Soloist: Serge Prokofiev (Pianoforte); Symphony No. 2 in C (Haydn); Pianoforte Concerto (Prokofiev); Symphonic Poem, The Tempest (Tchaikovsky); Symphonic classique (Prokofiev). In the interval, Reading. 9.40, Sports Notes. 9.50, Dance Music. 10.0, News. 10.5, Dance Music. 10.30 (approx.), Close Down.

**WILNO**

533 kc/s, 563 metres; 16 kW.—6.20 p.m., Miscellaneous Announcements. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45 till Close Down, See Warsaw.

**ZURICH.**—See Schweizerischer Landessender.

**ALGIERS**

824 kc/s, 364 metres; 13 kW.—7.20, Popular Songs. J'ai trouvé une fleur (Georges); A dame joïe (Codini); Au pays d'amourette (Cuvillier); Change d'amour (Boukay); Petit Chagrin (Drimet); L'adorable Cantifeno (Spenser); Ta petite mari (Emmerhechts); L'angelus de la mer (Groublier). 7.55, News. 8.0, Time Signal. 8.2, Orchestral Concert. Overture, The Barber of Seville (Rossini); Valse des Blondes (Ganne); Selections from Thais (Massenet). 8.40, News. 8.45, Concert (contd.). Amours fragiles (Gauwin); Le Contreau (Botrel); The red handkerchief of Cholet (Botrel); Andante ulgioso (Filippucci); Danse Grecque (Ganne); Selection from Herodiade (Massenet). 9.30, News. 9.35, Dance Music. 9.55, News.

**ATHLONE**

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time, Weather, Stock Report and Gramophone Concert. 6.0, Gramophone Concert. 6.45, News. 7.0, Readings. 7.15, Gaelic Lesson. 7.30, Time Signal. 7.31, Concert of Irish Music by the Station Orchestra. 8.0, Tenor Solos by W. F. Watt. 8.20, Contralto Solos by Mme E. Haise. 8.25, Concert by the Station Orchestra. 8.50, Revue by Eva Brennan and Company. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Dance Music: Home-made Heaven; That's all that matters; In the Park in Patee; Meet me in the Gloaming; Wireless World Announcement; Let Bygones be Bygones; It's within your Power; Sunny Madeira; The Whispering Waltz. 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of Hospitals' Trust, Ltd.; En Promenade (Gillet); The Driver of the 8.15 (Longstaffe); A Highland Scene (Moore). Racing Commentary. Ben Hur (Armandola); Two Eyes of Grey (McGeogh); Reminiscences of Wales (Godfrey); Jolly Fellows (Vollstedt). 10.30, I.B.C. Goodnight Melody, followed by News and Weather. 10.40, Traditional Music. 11.0 (approx.), Close Down.

**BARCELONA**

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert. Selection from Carmen (Bizet); Pastorale (Wienisch); Minuet from the Sonata No. 11, Op. 22 (Beethoven); Italian Serenade (Holmes); Love Song (Burd); Bolero (Moszkovsky); Selection from Werther (Massenet). 7.0, Request Gramophone Records. In the interval at 7.30, Exchange. 8.0, Gramophone Music. 8.15, Anti-War Talk, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather Exchange and Market Prices. 9.5, Concert by the Station Orchestra. 10.0, Organ Recital by Juan Suñé Sintes, relayed from the Casa Guarro. Prelude and Fugue (Bach); Allegretto from the Symphony No. 4 (Guilmont); Minuet (Gigout); Scherzetto (Viérne); Grand Choral (Grey). 10.30, News, followed by Dance Music, relayed from the Casa Elibre. 12 Midnight (approx.), Close Down.

**BARI**

1,112 kc/s, 269.8 metres; 20 kW.—11.30 a.m., Quintet (concert. 12 Noon (approx.) to 3.30 p.m., See Rome. 3.30, Programme for Children. 3.55 to 5.35, See Rome. 5.35, News in Albanian. 5.45 (approx.) till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

**BELGRADE**

697 kc/s, 430.4 metres; 2.8 kW.—5.55 p.m., Time and Programme Announcements. 6.0, Talk. 6.30, Song Recital. 7.0, Talk. 7.30, Pianoforte Recital by Petar Dumicic; Tocata and Fugue in D minor (Bach-Taussig); Polonaise (Bach); Rondo alla turca (Mozart); Ballad in G minor, Op. 118 (Brahms); Moment musicale in F minor (Schubert); Musical Smiffbox (Liadow); An Old Tale (Milejevic); The Mill (Papanodopolu. 8.10, Concert by the Station Orchestra. In the interval at 9.0, Time and News. 9.45, Dance music relayed from the Auto Club.

**BERLIN**

**DEUTSCHLANDSENDER (Reichssender),** 183.5 kc/s, 1,635 metres; 60 kW.—1.0 p.m., Gramophone Concert Bavarian March Past (Scherzer); Alpine Potpourri, Auf dem Kirchtanzboden; Jetzt trink'n ma noch a Flascherl Wein (Lorenz); Tölzer Schützenmarsch (Fucik); Bavarian Ditty (Weiss-Ferd); Münchner Kinder (Löffelmeyer); Der alte Peter; Isartaler Schulplatter; Der boarische Bauer; Der Watschentanz; Almhüttenwäzler; Mein schönes Gärmisch; Upper Bavarian Mountaineering Song; Bandlantz; March. Immer lustig und fidel. 2.0, Programme for Children. 2.30, Weather and Exchange. 2.45, Reading (Hans Carossa). 3.0, See Hamburg. 4.0, Sports Notes. 4.20, The Five German Singers from Nürnberg. 5.0, A Poem. 5.5, Topical Talk. 5.15, See Munich. 5.20, Variety Programme. 5.45, Weather and News. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, To-day's Motto. 7.10, See Langenberg. 9.0, Weather and News. 9.5 (approx.), Radio Report on the Gliding at Gatow. 9.45, Weather. 10.0, Concert from Breslau 11.0 (approx.), Close Down.

**SATURDAY****OCTOBER THE FOURTEENTH****BERLIN**

**FUNKSTUNDE,** 715 kc/s, 419.5 metres; 1.5 kW.—3.0 p.m., Concert by the Berlin Kampfbund Orchestra, conducted by Hans Hörner: March (Lachner); Overture, Abu Hassan (Weber); Auf der Wanderschaft (Klughardt); Waltz, Die Werber (Lanner); Summer Night on the Fjord (Schjelderup); Two Swedish Dances (Tor Aulin); Waltz Fantasia (Glinka); Ballet Music from Aida (Verdi); Hungarian Rhapsody No. 1 (Liszt). In an interval at 4.0 (approx.), Talk: The 1933 Tennis Season. 4.30, Programme Announcements. 5.0, Pianoforte Recital by Luise Gmeiner: Fantasia in G Minor, Op. 77 (Beethoven); Ballad in F Minor (Chopin). 5.20, Theatre Talk. 5.30, The Funkstunde informs its Listeners. . . . 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Munich. 7.5, Dance Music by the Adalbert Lutter Band, relayed from the Zoological Gardens. 8.0 (approx.), Gala Concert, relayed from the Municipal Theatre, Stettin: Overture, Duet and Aria from Figaro (Mozart); Aria from Der Waffenschmid (Lortzing); Two Pieces from Carlows Songs (Graener); Song from The Gipsy Baron (Joh. Strauss); Song and Duet from Little Dorrit (Künneke); Tenor Song, Ich liebe Dich! (Grossmann); Tähnweh (Heyse); Waltz, Du weisst, du bist mein altes Albrecht!; Tango, Der kleine Korporal (Nehring); Song from Waltzes from Vienna (Joh. Strauss); Songs (Nehring): (a) Warum, weshalb, wieso, (b) Einmal Dir gut sein; Kanon der Abonnement für Soloists, Choir and Orchestra (Grossmann). 9.0, Weather and News. 9.15 (approx.), Dance Music by the Adalbert Lutter Band, relayed from the Zoological Gardens. In the interval at 10.0, Topical Talk. 12 Midnight (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.  
BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.  
BODO.—See Oslo.

**BORDEAUX-LAFAYETTE**

986 kc/s, 304 metres; 13 kW.—7.0 p.m., Radio Journal. 7.55, Sports Notes. 8.5, English Lesson. 8.20, News. 8.30, La vie parisienne—Opera (Offenbach), relayed from Paris (Ecole Supérieure), 671 kc/s, 447.1 metres.

**BRATISLAVA**

1,076 kc/s, 279 metres; 14 kW.—3.0 p.m., Concert by the Station Orchestra: Overture (Blodek); Selection from Faust (Gounod); Scherzo capriccioso (Marsik); Elegy, Op. 15 (Chipp); Hungarian Dance No. 5 (Brahms). 3.50, See Prague. 4.15, A Marionette Play. 5.15, Talk for Housewives. 5.30, Gramophone Music. 5.45, Topical Talk. 5.55, Hints for Housewives. 6.0, See Prague. 6.25, See Brno. 6.55, See Prague. 9.15, See Moravská Ostrava. 10.30 (approx.), Close Down.

BREMEN.—See Hamburg.

**BRESLAU**

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.5 p.m., Gramophone Concert. 12.45, Time and News. 1.10, Gramophone Concert. 2.0, Agricultural Prices. 2.15, Book Review. 2.35, Talk: Modern German Literary History. 2.55, Film Review. 3.10, Gramophone Records. 4.15, Programme Announcements. 4.35, Reading (Ilcin Rusch). 4.50, Reading (Ilans Helfritz). 5.15, Radio Report from Munich: The Reception in the Tonhalle. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, News. 7.10, Programme to be announced. 7.30, Viennese Concert by the Station Orchestra, conducted by Ernst Topitz: Soloists: Adele Kern (Soprano), Anton Maria Topitz (Tenor), Georg and Margarete Hentzschel (Zither Duet); Wiener Jubel-Ouvertüre (Suppé); Waltz, Der Himmel voller Geigen (Ziehrer); Ein Tag im Wiener Wald (Kreuzberger); Waltz, Dorfschwalben aus Oesterreich (Jos. Strauss); Potpourri, Wiener Spaziergänger (Komzak); Im Kahlenbergdörfel (Fahrbach); Radetzky March (Joh. Strauss); Waltz, The Blue Danube (Joh. Strauss); Jetzt trink'n ma noch a Flascherl Wein (Lorenz); Deutscher-Marsch (Jurek); Waltz, Hereinspaziert (Ziehrer); Annen-Polka (Joh. Strauss); Lieder Quadrille (Joh. Strauss); Waltz, Die Schönbirner (Lanner); Polka-Mazurka, Die Libelle (Jos. Strauss); Polka, Morgenblätter (Joh. Strauss); Polka, Tritsch-Tratsch (Joh. Strauss); Sonntagskind-Quadrille (Millöcker); Waltz, Wiener Bürger (Ziehrer); Polka, Bitte schön (Joh. Strauss); Polka, KINGSSEND (Jos. Strauss); Galop, Bahn frei! (E. Strauss). In the interval at 9.20, Time, News and Announcements, and at 10.15, News. 11.30 (approx.), Close Down.

**BRNO**

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission: News, Pianoforte and Soprano Song Recital. 6.0, See Prague. 6.25, Programme of Folklore, Songs and Music. 6.55, See Prague. 9.15, See Moravská-Ostrava. 10.30 (approx.), Close Down.

**BRUSSELS (No. 1)**

**I.N.R.,** 590 kc/s, 609 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans. Carnival, (Glazunov); Waltz from The Sleeping Beauty (Tchaikovsky); Russian Rhapsody (Leemans); Violin Solo: Spanish Dance from La vida breve (Falla-Kreisler); Selection from Madame Butterfly (Puccini); In the Mystic Land of Egypt (Ketelbey); Speak Easy (Gensler); Selection from La Dame en décolleté (Yvain). 1.0 p.m., Le Journal Parlé. 1.10, Concert of Waltzes by the Station Symphony Orchestra, conducted by Kumps. Valse des Fleurs (Tchaikovsky); Le pas des Fleurs (Delibes); Loin du Bal (Gillet); Suite of Viennese Waltzes (Gilsou); Waltz Suite (Brahms). 4.45, Talk: National Industry—the Quarries of Belgium. 5.0, Dance Music, relayed from the St. Saneur Palais de Danes. 6.0, Talk: The Valley of the Warclie. 6.15, Gramophone Music. Funérailles (Liszt); Tambourin (Leclair). 6.30, Concert by the Small Station Orchestra, conducted by Leemans. Overture, May-Day (Haydn-Wood); Orchestral Suite (Guiraud); The Kiss Serenade (de Micheli); Valse triste (Sibelius); Selection from Lahné (Delibes); Humoresque for two Violins (Doullez); Waltz, Gold and Silver (Lehar); Ballet Music from Romeo and Juliet (Gounod). 7.30, Wireless Notes. 8.0, Gramophone Concert. Pagodes (Debussy); Chinese Dance (Tchaikovsky); Tambourin chinois (Kreisler); Third Movement from Antar (Rimsky-Korsakov). 8.15, Must the Mandarin die?—Radio Play (Theo Fleischmann), with Music by Marcel Poot. The Orchestra and Choirs, conducted by Franz André. 9.0, Concert by the Radio Orchestra, conducted by Franze André. Soloist: Conchita de Aguila (Castanets); Military March (Schubert); Overture, Die Fledermaus (Strauss); Castanet Solos. Allegro (Haydn); Jazz 1933 (Candrix); Symphonic Suite (Ibert); Rapsodie dahoméenne (De Boeck). 10.0, Le Journal Parlé.

**BRUSSELS (No. 2)**

**N.I.R.,** 887 kc/s, 338.2 metres; 15 kW.—12 Noon, Concert by the Station Symphony Orchestra, conducted by Kumps. Overture, The Bartered Bride (Smetana); Zorahyada (Svendsen); Two Basque Airs (arr. Kumps); Gramophone Records: Extracts from Lohengrin (Wagner); Nursery Suite (Ingelbrecht); Dances from Prince Igor (Borodin). 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans. Military March (Schubert); Suite, Scènes napolitaines (Massenet); Waltz-Intermezzo, Broussais-sous bois (Razigade); Judex from Mors et Vita (Gounod); Chopin Fantasia (Pétrus); 'Cello Solo, Neapolitan Serenade (Sgambati); Tango (Langlois); Waltz, Sei mir gegrüsst (Wilczkynsky-Grothe); Fox-trot, Wann du nicht kommst, dann haben die Rosen umsonst geblüht (Heymann). 5.0, Concert of Popular Music by the Radio Orchestra. 6.15, Talk: Eclipses of the Sun and Moon. 6.30, 'Cello Recital. Sonata (Samaritini); Kol Nidrei (Bruch); Second and Third Movements from the Concerto (Lalo). 7.0, Symphony, No. 3 in C Minor (Saint-Saëns), on Gramophone Records. 7.30, Film Review. 8.0, Concert by the Station Symphony Orchestra, conducted by Kumps. Canadian Fantasy (Gilsou); Petite suite (Kalkman); 'Cello and Orchestra: Elégie (Massenet); Pianoforte and Orchestra: Canzonetta (Pierne); Ballet Music from Sylvia (Delibes). 8.45, Talk. 9.0, Concert (contd.). Fantasia on Two Popular Flemish Songs (de Boeck); Old Dance Suite (Rasse); Two Songs: Tarentella (Rossini); Valse triste (Sibelius); Claironnerie (Ducasse); Two Songs; Egyptian March (Strauss). 10.0, Le Journal Parlé.

**BUCHAREST**

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert of Light Music and Romanian Music by the Station Orchestra. In the interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Song Recital on Gramophone Records. 6.40, Talk. 7.0, Suite for 'Cello (Saint-Saëns), by Joseph Thaler. 7.30, Vocal Quartet Concert. 8.0, Talk. 8.15, Sound Film Music. 8.45, Radio Journal.

**BUDAPEST**

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 840 metres from 6.0 p.m. (approx.) till Close Down.—4.30 p.m., Concert by the Budapest Concert Orchestra. 5.30, Answers to Correspondence. 6.0, Song Recital by

Ladislav Szücs. 6.45, Variety Programme. 8.45, News. 9.0, Dance Music by Pogány and his Band from the Café Baross. 10.0, Lajos Kiss and his Cigany Band from the Café Baross. 11.0 (approx.), Close Down.

CASSEL.—See Frankfurt.

**COPENHAGEN**

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall. 11.5, Concert from the Bellevue Strandhotel. 1.0 p.m., Interval. 1.30, Gramophone Concert. 2.0, Reading for Children. 2.30, Concert by the Carl Rydahl Ensemble: Overture, Nakhir Hochzeit (Lincke); Waltz, Ma hien aimée (Walduffel); Selection from Frederica (Lehar); Minuet for Strings from Berenice (Händel); Intermezzo from A Midsummer Night's Dream (Mendelssohn); Schön Rosmarin (Kreisler); Torch Dance (Jørgensen); Fantasia on Swedish Folk Themes (Eysden); Amelia Waltz (Lumbye); Lullaby (Andersen); Serenade from a Suite (Roikjer); Solveig's Song from the Peer Gynt Suite (Grieg); March (Patoznik). In the interval, Reading. 4.30, Exchange and Fish Market Prices. 4.45, Talk: Ski-ing in Norway. 5.15, French Lesson. 5.45, Weather and News. 6.0, News. 6.15, Time Signal. 6.30, Talk: Special Courts of Justice for Children and Young People. 7.0, Time Signal from the Town Hall. 7.1, Pianoforte Sonata in E Flat (Kuhlau), played by Polmar Jensen. 7.20, Danish Travel Poems—Talk on the Romantics, with Songs by Hallander Lellemann. 8.0, Concert of Viennese Music by the Station Orchestra, conducted by Fritz Mahler: Extracts from the Divertimento, No. 17, in D (Mozart); Overture in B Flat (Schubert); Ballet Music from Rosamunde (Schubert); Waltz, Morgenblätter (Strauss); Pizzicato Polka (Strauss); Overture, Die Fledermaus (Strauss); Overture, Fatinitza (Suppé); Waltz, Dorfschwalben aus Oesterreich (Jos. Strauss); Overture, Poet and Peasant (Suppé); Waltz, Sphärenklänge (Strauss); Overture, Die schöne Galathee (Suppé). In the interval at 9.0, News. 10.0, Dance Music by Teddy Petersen and his Band, relayed from the Wivex Restaurant. In the interval at 11.0, Time and Chimes from the Town Hall. 11.15 (approx.), Close Down.

CORK.—See Athlone.

**CRAWG**

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Topical Talk. 6.20, Miscellaneous Announcements. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45 till Close Down, See Warsaw. 11.0 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

**FECCAMP**

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C. 11.0, Happy Hour: Signature Tune; By the Swanee River (Myddleton); Somewhere a Voice is calling; Waltz, Morella (Cuvellier); Die Spieluhr des Pompadours (Noack); Pan and the Wood Goblins (Rathke); Perdita (Cuvellier); Dwarf's Patrol (Rathke); Wiener Blut (Joh. Strauss). Part II, Dance Music: Sweet Dreams pretty Lady; Let's call it a Day; Sui-down in a little green Hollow; Adorable; Lazy Bones; Dancing to save your Sole; Oh! Johanna; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Mandoline Band Concert for Tunbridge Wells and Isle of Thanet Listeners: Signature Tune, Night by the Sea; Mazurka, La Czarine (Ganne); Czardas (Monti); Tesoro Mio (Beucchi); Mandoline (Thomé); Loin du bal (Gillet); Napolitana (Hay); Capriccio Mazurka (Arienza); In old Seville (Rosen). 5.30, Light Orchestral Concert for Dover and Folkestone Listeners: March from Sylvia (Delibes); Pulcinello (Aletter); Song, Fairy Tales of Ireland (Coates); Selection from Sari (Kálmán); Evolution of Dixie (Lake); Xylophone Solo, Dance (Abbey); The Skaters' Waltz (Walduffel); Selection from Nalla (Delibes); Signature Tune. 6.0, Programme in French. 11.0 till Close Down, Programme in English by the I.B.C. 11.0, Tunes from the Talkies: Signature Tune, Sittin' in the Dark; Selection from The Kid from Spain; There'll still be Love; Why has a Cow got four Legs; Sweep; In the Moonlight; Mrs. Bartholomew; Falling in Love again; Selection from Show Boat (Kern); Signature Tune. 11.30, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of Hospitals' Trust, Ltd.: Signature Tune. Come back to Erin; Snacks in Bars (Egerer); Crazy Pionette (Frisk); The Mountains of Mourne (French); Xylophone Solo, Old Fishes (Frøger); Song, Killarney (Balfe); Chinatown, my Chinatown (Schwartz); Vienna, Vienna (Foss); The Wedding of the Birds (Peterson); Signature Tune. Come back to Erin. 12.5 a.m. (Sunday), Late News Bulletin in English. 12.10 (approx.), Club Concert for Hull Listeners: Signature Tune, The Chum Song; I lost my Girl from Memphis; I'ven-thirty Saturday Night; I'm yours; The Moon is low; Get happy. Part II, Dance Music by the Rhythm Rascals (Electrical Transcriptions): Maybe I love you too much; Waiters on Parade; No more Love; Da Dar, Da Dar; I'm one of the Lads of Valencia;

OCT. 14th **SATURDAY** continued

There's a Light in your Window; Dance of the Cuckoos; Pagan Moon; Signature Tune. 1.0, Dance Music; Signature Tune, Bells of Normandy; Reflections in the Water; Under a Blanket of Blue; It's Sunday down in Caroline; My Gipsy Rhapsody; At the Old Pig and Whistle; Learn to Croon; You'll never get to Heaven that Way; Let's call it a Day; Drifting down to Shalimar; You are too beautiful; Sun-down in a little green hollow; Lazybones; Down in the Valley; Love Songs of the Nile; Isn't it Heavenly; Sweet Dreams, pretty Lady; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

**FLENSBURG.**—See Hamburg.  
**FLORENCE.**—See Turin.

**FRANKFURT**  
1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, 1,220 kc/s, 245.9 metres; and Trier, 1,157 kc/s, 259.3 metres.—11.0 a.m., Concert by the Station Orchestra, conducted by Walter Caspar; Overture, Banditenstrieche (Suppé); Maritana Waltz from Don Cesar (Dellinger); Selection from Der arme Jonathan (Müllacker); Polka-Mazurka, Der Klügere gibt nach (Joh. Strauss); Waltz, Gebirgskinder (Ziehrer); Overture, Kapitän Fracassa (Dellinger); Polka, Das erste Du (Ziehrer); Selection from The Bird Fancier (Zeller); Waltz, Freundengrüsse (Joh. Strauss); Galop, Frisch durchs Leben (Joh. Strauss). 12.15 p.m., Time and News. 12.25, News and Weather. 12.35, Gramophone Concert of Light Music. 1.30, Programme for Young People. 2.15, See Stuttgart. 2.30, Weather. 2.40, Time and Economic Notes. 3.0, See Stuttgart. 5.0, Post War Youth and their Start in Life—Radio Report. 5.20, Review of the Week. 5.35, Programme to be announced. 5.50, Weather and News. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Topical Talk. 7.10, See Langenberg. 9.0, Time and News. 9.20, See Stuttgart. 9.30, News. 10.0, See Langenberg. 11.0, See Stuttgart. 1.0 a.m. (Sunday), Close Down.

**FREDRIKSSTAD.**—See Oslo.  
**FREIBURG.**—See Stuttgart.  
**GENEVA.**—See Radio-Suisse Romande.  
**GENOA.**—See Turin.  
**GLEIWITZ.**—See Breslau.  
**GÖTEBORG.**—See Stockholm.  
**GRAZ.**—See Vienna.  
**HAMAR.**—See Oslo.

**HAMBURG**  
806 kc/s, 372 metres; 1.5 kW. Relayed by Berlin, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hannover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m. (from Bremen), Orchestral Concert, conducted by Franz Koehncke, relayed from the Lincor Bremen; Overture, Casanova (Lincke). Poem (Koehncke); Waltz, Fäschlingskinder (Ziehrer); Dance Intermezzo, Sommernähtchen (Caylor); Song, Ueber's Meer grüss' ich dich, Heimatland (Kromer); Potpourri, Suppé-Musicien (Michaelov); March, Unser Commodore (Koehncke). 4.0, Topical Talk. 4.30, Short Stories. 4.50, Variety Programme. 5.35 (from Kiel), Religious Programme. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, A Musical Potpourri—Concert by the Hamburg Philharmonic Orchestra, conducted by Adolf Secker, the Small Station Orchestra, conducted by Gerhard Maasz, the Station Choir and Mai-Voice Quartet, the Bumeke Saxophone Quartet and Soloists. 8.30, Dance Music by the Alexander Band, relayed from the Trocadero. 9.0, Time and News. 9.30, Light Music and Dance Music, relayed from Berlin (Funkstunde). 12 Midnight (approx.), Close Down.

**HANOVER.**—See Hamburg.

**HEILSBURG**  
1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert of Light Music. In the intervals at 1.0 and 1.30, News. 2.0, Agricultural Prices and Exchange. 2.30, Talk: Work for Girls. 3.0, Concert by the Small Station Orchestra, conducted by Eugen Wilken; Overture, Les puits d'amour (Balfe); Intermezzo from I quattro rusteghi (Wolf-Ferrari); Suite from the American Forest Idylls (MacDowell); Liebeswalzer (Reger); Humoresque (Reger); Waltz, Tales from the Enstal (Pachernegg); Selection from Where the Lark Sings (Lehár); Overture, Semiramis (Rossini); Suite, At the Circus (Armandola). 4.25, Talk: Post Coaches and Postillions in Old Prussia. 4.50, Programme Announcements for the Coming Week. 5.0, Concert by the Small Station Orchestra, conducted by Eugen Wilken; Overture, The Princess in the Golden Slippers (Rust); Suite mignonne (Sibelius); Waltz in E (Moszkowsky); Selection from Ihre Hoheit die Tänzerin (Goetz); Leichte Brüder (Rust). In an interval at 5.15, Agricultural Prices. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Weather and News. 7.10, East German Military Programme. 8.10, Concert from Hamburg. 9.10, News. 9.15 (approx.), Dance Music from Berlin (Funkstunde). 11.30, Close Down.

**HILVERSUM**  
1,013 kc/s, 296.1 metres; 7 kW up to 5.40 p.m. and 20 kW from 5.40 p.m.—11.40 a.m. till Close Down. Programme of the Workers' Radio Society (V.A.R.A.). 11.40 a.m., Concert by the Little V.A.R.A. Orchestra, conducted by Hugo de Groot; Honey-moon (Rosey); Waltz, Dolores (Waldteufel); Légende d'amour (Beccia); Komm, Cigány, from Countess Maritza (Kálmán); Italian Rhapsody (Raunon); Polospiel (Fotras). Gramophone Music. A Bunch of Roses (Chapi); Melody (Kratz); Blumengeflüster (von Blon); Larghetto (Mozart); Melody (Boxe); Wien wird bei Nacht erst schön (Stolz). Gramophone Music. Ein badinatt (d'Ambrosio); Scandinavian Suite (Frederiksen); Waltz from The Dollar Princess (Kálmán). 1.55, Gramophone Music. 2.30, Talk. 2.50, Organ Recital by C. Steyn. 3.10, Concert by the Rotterdam Philharmonic Orchestra, conducted by Flipse; Overture, The Bartered Bride (Smetana); Arbeit (Monnikendael); Five Orchestral Pieces (Borek); Violin Concerto, Op. 35 (Szymanovsky). 4.10, Talk: The Billiard Championship. 4.30, Concert (cont'd.). Symphonic Poem, Scheherazade, Op. 35 (Rimsky-Korsakov). 5.10, Literary Talk. 5.32, Concert by De Fliefflueters, conducted by v. d. Horst. 5.55, Concert by the V.A.R.A. Children's Choir. 6.5, Concert by De Fliefflueters (cont'd.). 6.25, Choral Concert (cont'd.). 6.40, Talk. 7.10, Gramophone Music. 7.35, S.O.S. Messages. 7.40, Talk. 7.50, News. 7.55, Concert by the V.A.R.A. Orchestra, conducted by Hugo de Groot; Overture, Maritana (Wallace); Wiener Mädel (Steiner); The Rose Beetle goes a-wooing (Armandola); The Teddy Bears' Picnic (Bratton); Bauerntänze aus Österreich (Pachernegg); Ballet égyptien (Liginti). 8.40, Song Recital by Petit: Les herbeaux (Fauré); Song (Nerwin); Song from La maison grise (Messager); La vague et la cloche (Duparc); Les vieilles de chez nous (Lévy); Ronde d'amour (Chaminade). 9.0, Dramatic Programme. 9.40, Orchestral Concert (cont'd.): So schön wie es einmal war (Dauber); Le tango d'amour (Filippucci); Czardas (Enoch); Selection from The Belle of New York (Kerker). 10.10, Variety Programme. 10.15, Gramophone Music. 10.30, Orchestral Concert (cont'd.): Melody (Metallo); The Squirrel Dance (Smith); I'm thru' with Love (Mallneck); Die welt im Lied (Intrator). 10.55, Gramophone Music. 11.40 (approx.), Close Down.

**HOBY.**—See Stockholm.  
**HUIZEN**  
160 kc/s, 1,875 metres; 7 kW until 3.40 p.m. Transmitted from Kootwijk on 50 kW from 3.40 p.m. Programme of the Catholic Radio Society (K.R.O.).—11.55 a.m., Concert by the Vienna Station Octet; Curro Cucharas (Metallo); Moonlight on the Alster (Fetras); Overture, Der Erlenkügel (Kublan-Göngel); Selection from Les millions d'Harlequin (Drigo); Selection from the Tales of Hoffman (Offenbach-Weninger); Selection from The Pearl Fishers (Bizet); Parade des Emboupoints (Aubert-Baensch); Bella vista (Morena). Gramophone Music. Potpourri, Dividendi (Morena); Waltz from Faust (Gounod-Weninger); Nina-Nanna (de Micheli-Haensch); Czardas (Siklas-Kempner); Polospiel (Fetras); Finale. 1.40, Programme for Children. 3.40, Concert by the K.R.O. Orchestra, conducted by van't Woud; Dahomian Rhapsody (de Bock); Terpsichore (Ganne); Three Arabian Dances (Ring). 4.10, Handwriting Lesson. 4.40, Concert (cont'd.): Overture, L'épave villageoise (Grétry); Selection from Samson and Delilah (Saint-Saëns). 4.55, Sports Talk. 5.10, Concert (cont'd.): March, Tiergarten (Dik); Overture, Banditenstrieche (Suppé); Hoffballtänze (Lanner); Einzug der Frühlingsblumen (Kockert); Grieg Potpourri (Rbach); Spanish Dance No. 8 (Sarastate); Waltz, The Blue Danube (Joh. Strauss). 6.0, Press Review. 6.25, Concert (cont'd.): Selection from The Czarevitch (Lehár). 6.40, Police Notes. 6.55, Talk: Corsica. 7.15, Gramophone Music. 7.30, Talk on Esperanto. 7.40, Variety Concert, The Domgrafen Vocal Quintet, the Vereenigde Haagsche Spelers, conducted by Balldyn and the K.R.O. Boys, conducted by Lustenhouwer. Popular Music: Songs: (a) Wir singen (Ascher). (b) Es wird wieder Frühling sein (Dostal). (c) Ein Lied aus meiner Heimat (Jürmann). (d) Eins, zwei, drei, vier (Abraham). Popular Music, Dramatic Items—Popular Music: Songs, Popular Music—Songs: (a) Ueber landpartie (Leopoldi). (b) Schade, dass Liebe ein Märchen ist (Kaper and Jürmann); Tugendwo auf der Welt (Hexmann); Radetzky March (Joh. Strauss-Werth). In the interval at 8.10, News. 10.40, Gramophone Music. 11.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.  
**KALUNDBORG.**—See Copenhagen.  
**KATOWICE**  
734 kc/s, 408 metres; 16 kW.—6.20, Announcements and Gramophone Music. 6.25

p.m., See Warsaw. 8.0, Gramophone Music. 8.20 till Close Down. See Warsaw.

**KIEL.**—See Hamburg.  
**KLAGENFURT.**—See Vienna.  
**KOSICE.**—See Prague.

**LAHTI**  
167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—6.40, Concert by the Station Orchestra, conducted by Linko. 6.10, Talk. 6.25, Song Recital. 6.45, A Play. 7.15, Concert by the Station Orchestra. 7.45, News in Finnish and Swedish. 8.15, Dance Music by the Melody Boys, relayed from the Grand Restaurant. 10.0 (approx.), Close Down.

**LANGENBERG**  
635 kc/s, 473 metres; 60 kW.—12.35 to 2.30 p.m., See Frankfurt. 2.30, Programme for Young People. 2.30, Economic Notes. 2.40, Talk: Excursions in the Rhineland and Westphalia. 3.0, See Stuttgart. 5.0 to 5.35, See Frankfurt. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, See Frankfurt. 7.10, Variety Programme, Part I, relayed from the Essen Radio Exhibition. 9.0, See Frankfurt. 9.20, See Stuttgart. 9.30, News. 9.40, Serenade on Gramophone Records. 10.0, Variety Programme, Part II, relayed from the Essen Radio Exhibition. 11.0, See Stuttgart. 1.0 a.m. (Sunday), Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**  
769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—1.30 p.m., News. 1.45, Programme for Children. 2.30, Reading (Kaegel). 2.45, Economic Notes. 3.0, See Hamburg. 4.30, Talk: Paul de Lagarde. 5.0, Talk: The Meaning of German Names. 5.20, Talk: Agrarian Policy. 5.30, Balalaika Recital by Mischea Ignatjef; Träumerei, Op. 15, No. 7 (Schumann); Waltz in A, Op. 39, No. 15 (Brahms); Mazurka, Kuyawiak (Wienerivsky); Slav Melody and Czardas (Schumakov); Russian Song, Kumuschki (Krassev); Elegy, Tempt me not (Glinka); Valse caprice (Dobrochtov); Variations on a Russian Dance Song (Ignatjef). 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Choral Concert. 8.15, Dance Music by the Emdé Orchestra. 9.0, News. 10.0, Old-fashioned Cabaret Programme. 11.30 (approx.), Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**  
522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Talk. 6.30, Review of Foreign Affairs. 7.0, Dance Music. 7.45, National Songs by a Trio, with Guitar and Accordion Accompaniment. 8.30, Weather and News. 9.0, Dance Music by the Radio Jazz Band. 10.0 (approx.), Close Down.

**LUXEMBOURG**  
252 kc/s, 1,191 metres; 200 kW.—French Evening.—7.30 p.m., Symphony in F—the Pastoral (Beethoven) (Gramophone Records). 8.25, Talk in French. 8.35, Overture, Le roi d'Ys (Lalo), on Gramophone Records. 8.50, News in French. 9.0, Song Recital. Aria from Polyenete (Gounod); La nuit (Rubinstein); Après un rêve (Fauré); Toujours (Fauré); Hindu Song (Rimsky-Korsakov); Aria from Romeo and Juliet (Gounod). 9.30, Song recital by Caruso (Gramophone Records). 9.50, News in German. 10.0, Gramophone Concert of Variety Music. 10.30, Dance Music on Gramophone Records.

**LWOW**  
788 kc/s, 381 metres; 16 kW.—6.5 p.m., Announcements and Gramophone Music. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 9.10, Light Orchestral Music with Songs by Zubik (Tenor). 11.0 (approx.), Close Down.

**LYONS**  
LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.30 p.m., Radio Gazette for Lyons and the South-East. 8.30, Vocal and Orchestral Concert. After the Concert, News.

**MADRID**  
**ARANJUEZ (EAQ), 9,860 kc/s, 30.43 metres; 29 kW.—6.0 to 8.0 p.m., Programme for Listeners in the Canary Islands, Guinea and Europe. 6.0, Concert. 7.15, Talk. 7.30, Light Music. 8.0, Interval. 10.30, Programme from Madrid (EAJ7). In the interval Radio Chronicle. 12 Midnight till Close Down. Programme in English by the I.B.C. 12.0, Concert: Dream Waltz; Oh, Sailor Behave; Just like in a Story Book; Bananas; Selection from Congress Dances; Beautiful Spring; Selection from Viktoria and her Hussar; Only a Rose. 12.30 a.m. (Sunday), I.B.C. Goodnight Melody and Close Down.**

**MADRID**  
EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Radio Journal and Dance Music. 8.15, Topical Review. 8.30 to 10.0, Interval. 10.0, Chimes, Time and Topical Review. 10.20 (approx.), Musical Programme. 12.15 a.m. (Sunday), Topical Review. 12.30 (approx.), Chimes and Close Down.

**MALMO.**—See Stockholm.  
**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**  
1,137 kc/s, 263.8 metres; 11 kW.—5.25 p.m., Concert of Schrammel Music. 6.0, See Prague. 6.25, See Brno. 6.55, See Prague. 9.15, Concert by the Station Orchestra, conducted by Musil. 10.20 (approx.), Close Down.

**MOSCOW**  
**TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m. and 1.45 p.m., News. 2.0, The Dance—Pianoforte. Soprano, and Violin Recital of Music by Händel, Wackerlin, Thomas, Chopin, and Rimsky-Korsakov. 3.0, English Lesson. 3.30, Reading of Poems (Pushkin). 4.30, Programme for Young People. 5.30, Concert by a Symphony Orchestra, conducted by Chaikin, and Soloists; Music by Corelli, Vivaldi, Bach, and Händel. 8.0, News. 8.30, Programme Announcements. 8.55, Time Signal. 9.5, Press Review. 10.8, Weather.**

**MOTALA.**—See Stockholm.  
**MUHLACKER.**—See Stuttgart.

**MUNICH**  
563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 530 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Concert, conducted by Erich Kloss: Overture, The Four Ages of Man (Lachner); Three Pieces (Henselt): (a) Ave Maria, (b) Fontaine, (c) Gondola; Bolero (Nicoled); Verdi Potpourri (Rhode); Three Pieces (Schiller): (a) Anna Gavotte, (b) Amor auf dem Ball; Selection from La poupee (Audran); Czardas (Zechenbauer); Intermezzo, Püppelchens erste Liebe (Meisel). 4.45, Franzl wird Zimmermann (Franz turns Carpenter)—Play for Young People (Paul Sorembé). 5.15, Community Singing by Young People. 5.30, Folk Song Recital by Robert and Lies Kothe (Songs to the Lute) and Marieluise Stamer (Violin). 5.45, Wireless Notes. 6.0, Transmission for all German Stations: Krone der Städte-Munich Festival Play (Josef Magnus Wehner) after the story by Josef Ruederer. 7.0, Programme to be announced. 9.20, News. 10.0, Serenade. 11.0 (approx.), Close Down.

**NAPLES.**—See Rome.  
**NOTODDEN.**—See Oslo.

**OSLO**  
277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—3.30 p.m., Gramophone Music. 4.15, Programme for Children. 5.15, National Music. 5.45, Talk on Economics. 6.0, News. 6.30, Talk. 7.0, Time Signal. 7.2, Concert by the Station Orchestra, conducted by Hugo Kraumm: Arab March (Ganne); Overture, Das Modell (Suppé); Suite, Joyous Youth (Coates); Peasant Festival (Grieg); None but the weary Heart (Tchaikovsky); Peasant Idyll (Hanson); Czardas, Honka (Mielnich); Piece (Curtis); Melody (Bernards); Selection from Les cloches de Corneville (Plaquette); Waltz, Over the Waves (Rosas); Phantom Melody (Ketilbey); Two Melodies (Olson); Seville (Alfonso); March Potpourri (Robert). 8.10, Literary Review. 8.40, News. 9.0, Topical Talk. 9.15, Songs and Weekly Revue. 9.45, Gramophone Dance Music. 11.0 (approx.), Close Down.

**OSTERSUND.**—See Stockholm.  
**PALERMO**  
558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Popolavoro Announcements, Tourist Talk, Agricultural Report and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, La casa innamorata—Operetta in Three Acts (Ranzato). In the intervals, Talk and Book Review. After the Operetta, Giornale Radio.

**PARIS**  
**POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Concert of Records by the Marek Weber Orchestra: Caravan (Zelenko-Bayer); Melody (Strauss); Selection from Cavalleria rusticana (Mascagni). 7.15, Le Journal Paris. 7.30, Extracts from Figaro (Mozart) on gramophone records. 7.50, Topical Talk. 8.0, Theatre Review. 8.25, Albert Roussel Concert of Chamber Music. 9.10, Dance Music by the Sonora Radio Band, conducted by Fred Hoffmann. 11.0, News.**

**PARIS**  
**RADIO PARIS, Call GFR, 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m., Weather and Physical Culture. 7.45, Gramophone Music. 8.0, Weather and Press Review. 9.0, Con-**

OCT. 14th SATURDAY continued

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—8.5 p.m., Programme for Children. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, Chimes and News. 9.30, Reading. 10.0, Concert by the Station Trio, followed by Choral Music on Gramophone Records. After the Programme, Dance Music. 1.0 a.m. (Sunday), Close Down.

RIGA

625 metres; 15 kW.—6.5 p.m., In Africa—Concert. 7.0, News. 7.20, Recital of Modern Pianoforte Music. 7.50, Light Music. 8.0, Weather and News. 8.30, Gramophone Dance Music. 9.0, Dance Music from the Café Svares. 10.0 (approx.), Close Down.

RUKAN.—See Oslo.

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 622 kc/s, 453.2 metres, from 7.45 p.m., and 2RO, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—11.30 a.m., Gramophone Music. 12 Noon, Orchestral Concert: Madrilena (Fagioli); Serenata all'angioletta (Restauro); Waltz, Lorenza (Culotta); Waltz (Leopold); Selection from La vergine rossa (Cuscinà); Iliadina (Chwat); Bacchanale (Azzoni); Catarinette (Ravasini). In the interval from 12.30 p.m. to 12.45, Giornale Radio. 1.0, Time and Announcements. 3.30, Programme for Children. 3.55, Giornale Radio and Report of the Royal Geographical Society. 4.10, Weather. 4.15 to 5.0, Orchestral Concert: Dallah (Dax); Dance of the Butterflies (Rassel); Waltz, The Waltz you gave to (Michalov); The Sacred Wood (Lindermann); Selection from Suor Angelica (Puccini); Mazurka, Chita (Barzizza); Glow Worm Idyll (Lincke); Uno strano modello (Escobar). 5.40 (Naples), Shipping and Sports Notes. 5.45, Morse Signals and Dopplavoro Report. 6.0, Tourist Report. 6.10, Grain Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Gramophone Music. 7.30, Giornale Radio. 7.45, Instrumental Concert: Arcangelo Masotti (Cello), Gioconda de Vito (Violin). Cello Solos: (a) Allegro (Vandini), (b) Adagio and Rondo (Boccherini); Concerto grosso in A Minor for Violin (Vivaldi-Nachez). Talk. Cello Solos: (a) Serenade (Popper), (b) Scherzo (Van Goens); Violin Solos: (a) Ninna-nanna (Spendiarov-Corti), (b) Hulla-zun and Balaton (Hubay), (c) Variations on the Fourth String from Mosè (Rossini). Humorous Talk. 9.0, Gramophone Music. Part I: Italian Songs in Dialect. Part II: Opera Music: Selection from The Force of Destiny (Verdi), Prelude to Edmea (Catalani), Selection from Mephistopheles (Boito). 10.0, Giornale Radio.

SALZBURG.—See Vienna.

SCHENECTADY

WCY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—12.45 a.m. (Sunday), Stock Reports. 1.0 to 4.0, New York Relay. 1.0, Rollickers Quartet. 1.15, Herman and Banta. 1.30, Sous les Ponts de Paris. 2.0, One Man's Family. 2.30, Popular Programme. 3.0, Hudson Saturday Dancing Party. 4.0, Programme Resumé.

SCHWEIZERISCHER LANDESENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 a.m. to 6.5 (from Berne), Gymnastics. 10.59, Time Signal and Weather. 11.0 (from Berne), Gramophone Music. 11.30, Time, Weather and News. 11.40 (from Berne), Gramophone Music. 12.25 p.m. (from Berne), Time, Weather and Exchange. 12.30 (from Basle), The Listeners' Quarter of an Hour. 12.45 (from Basle), Book Review. 1.15 (from Basle), Gramophone Music. 1.45 (from Basle), Programme for Children. 2.30, Interval. 4.0 (from Basle), Accordion Concert. 4.30 (from Basle), Wind Instrument Music on Gramophone Records. 5.0 (from Basle), The Training of the Deaf. 5.30 (from Basle), Talk: Busle and Erasmus. 6.0, Chimes from the Zürich Churches. 6.15 (from Zürich), Talk on the 7.0 Transmission: Alexander Zemlinsky and his new Opera Kreidekreis. 6.45 (from Zürich), Time, Weather and Exchange. 7.0 (from Zürich), Kreidekreis Opera in Three Acts (Zemlinsky), relayed from the Municipal Theatre. 10.0 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—3.0 p.m., Light Orchestral Concert: Selection from Così fan tutte (Mozart); Clair de lune (Debussy); La fille au cheveu de lin (Debussy); Liebeslieder (Strauss); Melody (Denza);

Piece (Bakker-Gröndahl); Selection from The Student Prince (Romberg); Fairy Tale (Merikanto); Melody (Rundel). 4.5, Programme for Children. 4.30, Song Recital by Wilhelm Hännstedt. 4.45, Gramophone Music. 5.45 (from Göteborg), Talk: The Swedish Language. 6.15, Weather and News. 6.30, Old Dance Music. 7.0, Radio Report. 7.45, Military Band Concert, conducted by Per Grundström: Military March (Gozzo); Overture, Der Geist des Wojewoden (Grossmann); In a Monastery Garden (Kettelbey); Selection from The Master-singers (Wagner); Dance (Ritter); Suite, Cubaland (Souza). 8.45, Weather and News. 9.0, Modern Dance Music. 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Concert of Classical Music. 12.45 p.m., News. 1.0, Time. 1.1, Gramophone Concert of Popular Music. 2.0, Legal Talk in German. 2.15, Light Music on Gramophone Records. 3.0, Musical Talk: Fauré's Sixth Nocturne. 3.15, Interval. 4.0, Light Music on Gramophone Records. 5.0, Padeloup Symphony Concert, relayed from Paris. 7.0, French Elocution Lesson. 7.15, Talk on Gardening. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Variety Programme. Part I: Ducas et Lucette—Opéra-Comique in One Act (Missa). Part II: (a) Six Lorraine Songs (Pierri) with Inès Maujean, (b) Lorraine Stories, (c) Variations on a Popular Song (Recktenwald). Part III: Auscultez-moi—One-Act Operetta (Delannay). In an interval at 9.30 (approx.), Press Review. 10.30, Dance Music, relayed from the Savoy. 12 Midnight (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.35 p.m., See Frankfurt. 2.15, Morse Lesson. 2.30, Guitar and Zither Recital. 3.0, Concert by the Württemberg Symphony Orchestra, conducted by Otto Seyfert; Soloist, Walter Ludwig (Tenor); Part I: Verwandlung der Lysischen Bauern in Frösche (Dittersdorf); Airs (Mozart): (a) Aria from The Magic Flute, (b) German Dances, (c) Aria from Il Seraglio; Overture, La Cenerentola (Rossini); Aria and Overture from Mignon (Thomas); Aria and Ballet Music from Coppelia (Delibes); Part II: Dance Music. In an interval, Dance Music on Two Pianofortes by Hubert Giesen and Otto Serfert. 5.0, See Frankfurt. 5.35, Talk: The German Chemist and the Nation's Health. 5.50, Time and Agricultural Notes. 6.0, Transmission for All German Stations, relayed from Munich. 7.0, See Frankfurt. 7.10, See Langenberg. 9.0, See Frankfurt. 9.20, Talk: Things you should know. 9.30, News. 9.40, See Langenberg. 10.0, See Langenberg. 11.0, Serenade. 1.0 a.m. (Sunday), Close Down.

SUNDSVALL.—See Stockholm.

TOULOUSE

RADIOPHONIE DU MIDI, 799 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Light Music. 6.30, Accordion Music. 6.45, Music from Sound Films. 7.0, Operetta Music: Selection from Le grand Mogul (Audran); Selection from Les cloches de Corneville (Planquette); Selection from Miss Decima (Audran). 7.15, News. 7.30, Spanish Songs. 7.45, Military Band Music. 8.0, Opera Music: Arias from Carmen (Bizet), The Barber of Seville (Rossini), La Bohème (Puccini), Marouf (Rabaud); Cavatina from Romeo and Juliet (Gounod); Aria from Mirella (Gounod); Selection from Le roi malgré lui (Chabrier). 8.30, Music by a Viennese Orchestra. 9.0, A Waltz Dream—Operetta (O. Straus) Concert Version. 9.30, Orchestral Concert. 10.0, Music from Sound Films. 10.15, News. 10.30, Concert for Listeners in Morocco. Part I: Accordion Music. Part II: Light Music. 11.0, Selection from L'Arlesienne (Bizet); Ballet Music from Faust (Gounod). 11.15, Dance Music. 12 Midnight, News. 12.5 a.m. (Sunday), Operetta Music: Arias from Les mousquetaires au couvent (Varney), Ciboulette (Hahn), and La mascotte (Audran). 12.15, Orchestral Concert. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

TRONDHEIM.—See Oslo.

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 995 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Talk for Women. 4.20, Gramophone Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Lottery Results, Dopplavoro Announcements and Gramophone Music. 6.0, Time, Tourist Talk and Gramophone Music. 6.10, Agricultural Talk and Market Reports. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio and Weather.

7.30, Talk: Events and Problems. 7.45, Variety Programme. 8.45, Book Review. 9.0, Dance Music. 10.0, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and 5,965 kc/s, 50.28 metres (Evening); 10 kW.—11.0 to 11.15 a.m., Religious Announcements in Various Languages. 8.0 to 8.15 p.m., Religious Information in Italian.

VIENNA

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 862 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 682 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m., Orchestral Concert: Selection from Die Landstricher (Ziehrer); Song, Wiener Stadt, du g'fallst mir wirklich nicht mehr (Krenzberger); Potpourri, Perlen vom Donaustrand (Uhl); Melody (Rubinstein); Josef Straus Potpourri (Fetras); March Feuer und Flamme (Männecke). 12 Noon, Time and Announcements. 12.10 p.m., Gramophone Concert: The Fountain in the Villa d'Este (Liszt); La Follia (Corelli); Der Hirt auf dem Felsen (Schubert); Du bist die Ruh' (Schubert); I want your Heart (Wood); Man lebt nur einmal (Joh. Strauss); Ciri-biribi (Pestalozza); Funiculi-Funicula (Denza). 2.0, Time and Announcements. 2.15, French Lesson. 2.40, Reading (Selma Lagerlöf). 3.0, Concert by the Christian Workers' Mandoline Society. 3.40, Talk: An Austrian's Experiences as a Lumberman in Lapland. 4.5, Gramophone Concert: Aria from Oberon (Weber); Serenade from I Pagliacci (Leoncavallo); Hungarian Dance No. 1 (Brahms); Hungarian Rhapsody No. 11 (Liszt); Wotan's Farewell and Fire Magic from The Valkyrie (Wagner). 5.15, Topical Talk. 5.45, Concert by the Wiener Symphoniker, conducted by Josef Holzer: Soloist: Franz Hoffmann (Tenor); Overture, The Arabian Nights (Strauss); Tenor Solos: (a) Durch die Praterauen zieht der Frühling ein (Frankovsky), (b) Ich brauch kein Monte Carlo und kein Nizza (Schindlauer), (c) So lang sich's Riesenrad im Prater draht; Waltz, Neues Leben (Komzak); Potpourri of Viennese Operetta Music (Hruby); Tenor Solos: (a) Die Nacht und der Frühling in Wien (Silving), (b) Einmal wird auch das vorübergehen (Spitzer), (c) Die Welt kann ja so schön sein (Götz); Waltz, Singen, lachen, tanzen (Ziehrer); Overture, Der Göttergatte (Lohr). 6.45, To-day's Motto. 6.50, Time and Announcements. 7.0, Prince Eugène of Savoy—Radio Sequence. 8.45, Announcements. 9.0, Dance Music by the Karl Haupt Band, relayed from the Kranz Ambassador Hotel, followed by Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Spanish Music on Gramophone Records. 11.30, Radio Journal and Weather. 11.35, Gramophone Music. 12 Noon, Interval. 12.30 p.m., Economic Notes. 2.40, Gramophone Music. 2.55, Aviation Report and Anti-Gas Drill. 3.0, Programme for Invalids, relayed from Lwow, 788 kc/s, 381 metres. 3.40, French Lesson. 3.55, Soloist Concert: Konopasek-Szalaska (Pianoforte), Szalaski (Contralto), and Mossozy (Bass); Contralto and Pianoforte: Sonata No. 4 (Ariosti); Three Bass Solos: Moniuszko; Nocturne and Minuet (Debussy); Berceuse and Habanera (Ravel); Bass Solos: (a) Aria from The Haunted Castle (Moniuszko), (b) Song (Rostworovsky), (c) Aria from La Juive (Halévy); Contralto Solos: (a) L'automne (Landovska), (b) Romance (Maszynski). 4.50, Talk on Gardening. 5.0, Talk: Polish Aeroplanes. 5.20, Organ and Violin Recital by Rutkovsky and Ochlesky: Prelude and Fugue in E Flat (Bach); Choral (Bach); Organ and Violin: Sonata in D Minor (Haas); Rhapsody (Ropartz); Scherzo (Verne). 6.5, Announcements. 6.25, Reading. 6.40, Programme Announcements. 6.45, Radio Journal. 6.55, Interval. 7.0, Orchestral Concert, conducted by Nawrot. 8.0, Answers to Correspondence. 8.20, Chopin Pianoforte Recital by Drzewiecky: Polonaise in E Flat, Nocturne in G Minor, Op. 15, No. 3; Impromptu in A Flat and G Flat Minor; Etudes in E Flat Minor, C Sharp Minor, Op. 10, and B Minor, Op. 25; Prelude in C Sharp Minor; Rondo à la Mazur, Op. 5, 9.0, Sports Notes. 9.10, Dance Music. 10.0, Weather and Police Notes. 10.5, Dance Music. 11.0 (approx.), Close Down.

WILNO

533 kc/s, 563 metres; 16 kW.—6.20 p.m., Miscellaneous Items. 6.25, Educational Talk. 6.40, Programme Announcements. 6.45, See Warsaw. 7.0, Request Gramophone Concert. 8.0 till Close Down, See Warsaw.

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—11.20, Cooking Recipes. 11.30, Gramophone Concert of Opera Music. 12.0, Programme Announcements. 12.2, Gramophone Concert. 12.30, News. 12.40 to 4.0, Interval. 4.0, Trio Concert. 6.45, News and Announcements. 7.15, Concert by the Radio Orchestra. Soloist: von Ella Baha (Soprano). 8.45, Dance Music. 9.0, Press Review and Weather. 9.15, Dance Music. 10.0 (approx.), Close Down.

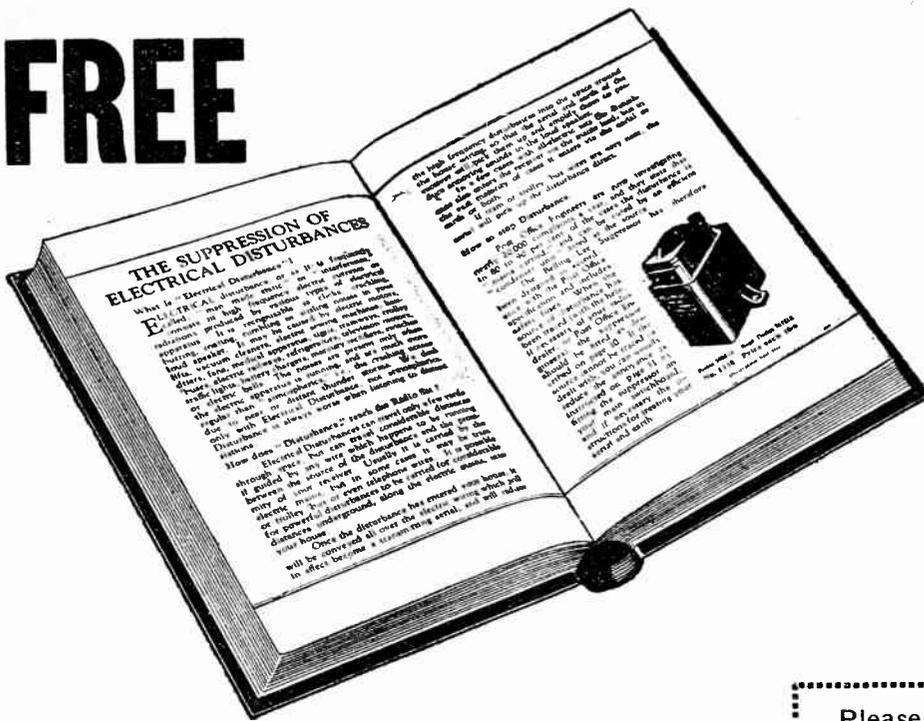
ZURICH.—See Schweizerischer Landessender.

# PRINCIPAL BROADCASTING STATIONS OF EUROPE

Arranged in Order of Wavelength

Metres.	kc/s.	kW.	Station.	Tuning Positions.	Metres.	kc/s.	kW.	Station.	Tuning Positions.
1935	155	7	Kaunas (Kovno) (Lithuania)		368.1	815	0.7	Fredriksstad (Norway). (Relays Oslo)	
1875	160	8.5	Hilversum (Holland) (Koolcyk, 50kW., after 3.40 p.m.) (K.R.O. and N.C.R.V. programmes.)		364.1	824	1	Bergen (Norway)	
1796	167	40	Lahti (Finland)		363.6	825	13	Algiers (Algeria)	
1725	174	75	Radio Paris. (FR)		360.6	832	60	Mühlacker (Stuttgart) (Germany)	
1635	183.5	60	Berlin (Deutschlandsender) (Germany). (S.-W. Stn. DJI on 31.38 m., DJB on 19.73 m., DJC on 49.83 m., DJD on 25.51 m., DJE on 16.86 m.)		355.9	843	50	London Regional (Brookmans Park) (Graz (Austria). (Relays Vienna)	
1554.4	191	30	Daventry National		352.1	852	7	Barcelona, EAJI (Spain)	
1538	195	7	Ankara (Angora) (Turkey)		348.8	860	7.6	Leningrad, RV70 (Russia)	
1481	202.5	500	Moscow, RV1 (Old Komintern) (Russia)		348.8	860	10	Strasbourg, PTT (France)	
1446	207.5	13	Eiffel Tower, FL, Paris		345.2	869	11.5	Brno (Brunn) (Czechoslovakia)	
1412	212.5	120	Warsaw I (Poland)		341.7	878	35	Brussels II Velthem (Belgium). (In Flemish)	
1380	217.5	100	Novosibirsk, RV76 I (Russia)		338.2	887	15	Cadiz (Spain)	
1354.4	221.5	30	Motala (Sweden). (Relays Stockholm)		335	896	5	Poznan (Poland)	
1304	230	100	Moscow, WZSPS (Trade Union) (Russia)		332.8	897	1.9	Milan (Italy). (Relays Turin)	
1200	250	5	Stamboul (Turkey)		325	923	60	Poste Parisien (France)	
1200	250	21	Reykjavik (Iceland)		321.9	932	10	Breslau (Germany)	
1190	252	200	Luxembourg		318.8	941	0.25	Göteborg (Sweden). (Relays Stockholm)	
1170	252	25	Tashkent, RV11 (Russia)		318.8	941	1.5	Dresden (Germany). (Relays Leipzig)	
1154	260	75	Kalundborg (Denmark). (Relays Copenhagen)		315.8	950	1.6	Naples, INA (Italy). (Relays Rome)	
1154	260	20	Monte Ceneri (Switzerland). (Temporarily closed.)		312.8	959	0.7	Marseilles, PTT (France)	
1117	268.5	40	Moscow, Popoff RV58 (Russia)		312.8	959	1.7	Radio Vitus (Paris). (S.-W. Stn. on 43.75 m.)	
1083	277	60	Oslo (Norway)		312.8	959	10	Cracow (Poland)	
1071	280	35	Tiflis, RV7 (Russia)		309.9	968	50	Genoa, IGE (Italy). (Relays Turin)	
1035	290	36	Kiev, RV9 (Russia)		307	977	0.75	West Regional (Washford Cross)	
1000	300	100	Moscow RV39 (Russia). (S.-W. Stn. on 50 m.)		304	986	13	Zagreb (Yugoslavia)	
938	320	20	Kharhov, RV4 (Russia)		304	986	13	Bordeaux Lafayette, PTT (France)	
857	350	100	Leningrad (Russia)		301.5	995	50	North National (Manchester)	
840	357	18.5	Budapest (Hungary)		298.8	1004	11	Tallinn (Estonia)	
825	363.6	50	Sverdlovsk, RV5 (Russia)		296.1	1013	20	Huizen (Holland). (7 kW. before 4.40 p.m.) (F.A.R.A., A.F.R.O. and V.P.R.O. programmes.)	
760	395	1.3	Geneva (Switzerland). (Relays Sottens)		293.5	1022	0.7	Limoges, PTT (France)	
720	416.6	20	Moscow, RV2 (Experimental) (Russia)		293.5	1022	2.6	Kosice (Czechoslovakia)	
690	434.6	1.5	Oulu (Uleaborg) (Finland)		291	1031	13.2	Viipuri (Viborg) (Finland). (Relays Helsinki)	
680	441.2	0.6	Lausanne (Switzerland). (Relays Sottens)		288.3	1040	50	Scottish National (Falkirk)	
574.7	522	7	Ljubljana (Yugoslavia)		288.3	1040	1	Bournemouth. (Relay Station)	
568.1	528	2	Grenoble (France)		286	1049	0.8	Montpellier (France)	
566	530	1.5	Hanover (Germany). (Relays Hamburg)		284.8	1053	0.7	Lyons (Radio-Lyon) (France)	
563	533	16	Wilno (Poland). (Relay Station)		283.6	1058	0.5	German Relays (Berlin, Magdeburg, Stettin)	
560	536	1.5	Kaiserslautern (Germany). (Relays Munich)		283.6	1058	0.5	Innsbruck (Austria). (Relays Vienna)	
550	545	18.5	Budapest No. 1 Lakihegy (Hungary)		282.2	1063	2	Lisbon (T. I.A. (Portugal). (Short-wave Station on 31.25 m.)	
542	554	10	Sundsvall (Sweden). (Relays Stockholm)		281.2	1067	0.75	Copenhagen (Denmark)	
537.6	558	3	Palermo (Italy)		278.8	1076	13.5	Bratislava (Czechoslovakia)	
533	563	60	Munich (Germany)		276.5	1085	60	Heilsberg (Germany)	
525	571	15	Riga (Latvia)		273.7	1096	7	Turin (Italy)	
517.2	580	100	Vienna (Bisamberg) (Austria)		271.5	1105	1.3	Rennes, PTT (France)	
509	589	15	Brussels No. 1, Velthem (Belgium). (In French)		269.8	1112	20	Bari (Italy) (Relays Rome)	
500.8	599	20	Florence, IF1 (Italy) (Relays Turin)		269.8	1112	0.25	Bremen (Germany). (Relays Hamburg)	
495.8	605	1.2	Trøndelag (Norway)		267.6	1121	0.75	Valencia (Spain)	
488.6	614	120	Prague (Czechoslovakia)		267.4	1122	6.25	Nvireghaza (Hungary). (Relays Budapest)	
480	625	50	North Regional (Manchester)		265.8	1128.5	1.3	Lille, PTT (France)	
472.4	635	60	Langenberg (Germany)		263.8	1137	11.2	Moravska Ostrava (Czechoslovakia)	
465.8	644	1.5	Lyons la Doua, PTT (France)		261.5	1147	50	London National (Brookmans Park)	
459.4	653	60	Beromünster (Schweizerischer Landessender) (Switzerland).		259.3	1157	17	Frankfurt-a.-M. (Germany)	
453.2	662		San Sebastian, EAJ8 (0.6 kW.): Pori (1.0 kW.) (Finland); Danzig (0.5 kW.) (relays Heilsberg); Klagenfurt (0.5 kW.) (Austria) (relays Vienna).		259.3	1157	2.3	Trier (Germany). (Relays Frankfurt)	
453.2	662	0.25	Agen (France)		257.1	1167	10	Hörby (Sweden). (Relays Stockholm)	
453.2	662	4	Milan (Vigentino) (Italy). (Relays Rome)		255.1	1176	0.7	Toulouse, PTT (France)	
450.3	666	20	Madona (Latvia). (Relays Riga)		253.1	1185	5	Gleiwitz (Germany). (Relays Breslau)	
447.1	671	7	Paris, Ecole Supérieure, PTT		252	1193	1	Barcelona, EAJ15 (Assoc. Nat.) (Spain)	
441.2	680	50	Rome, IRO. (S.-W. Station, 2RO on 25.4 m.)		249.6	1202	0.8	Juan-les-Pins, Nice (France)	
435.4	689	55	Stockholm, SANA (Sweden)		247.7	1211	10	Trieste (Italy). (Relays Turin)	
430.4	697	2.5	Belgrade (Yugoslavia)		245.9	1220		Berne (0.5kW.) (Switzerland) (relays Beromünster); Eskilstuna (0.2kW.); Säfte (0.4 kW.) (Sweden) (relays Stockholm); Cassel (0.25 kW.) (Germany) (relays Frankfurt); Linz (0.5 kW.) (Austria) (relays Vienna); Pietarsaari (0.5 kW.); Turku (Abo) (0.5 kW.) (Finland) (relays Helsinki).	
424.3	707	2	Madrid, EAJ7 (Union Radio)		244.1	1229	0.5	Basle (Switzerland). (Relays Beromünster)	
424.3	707	100	Moscow, Imeni Stalina (Russia)		242.3	1238	1	Belfast (N. Ireland)	
419.5	715	1.5	Berlin, Funkstudie (Germany)		240.6	1247	0.5	Stavanger (Norway)	
416.4	720.5	5	Rabat (Morocco)		238.9	1256	2	Nürnberg (Germany). (Relays Munich)	
413	725	60	Athlone (Irish Free State)		237.2	1265	1	Nimes (France)	
408.7	734	16	Katowitz (Poland)		237.2	1265	3	Bordeaux, Sud-Ouest (France)	
403.8	743	25	Sottens (Radio Suisse Romande) (Switzerland)		235.5	1274	0.5	Kristiansand (Norway)	
398.9	752	25	Midland Regional (Daventry)		235	1283	1.65	Lodz (Poland). (Relay Station)	
394.2	761	12	Bucharest (Roumania)		232.2	1292	0.25	Kiel (Germany). (Relays Hamburg)	
389.6	770	120	Leipzig (Germany)		227.4	1319	0.5	Flensburg (Germany). (Relays Hamburg)	
385.1	779	8	Toulouse (Radiophonie du Midi) (France)		225.9	1328	10	Fécamp, Radio-Normandie (France)	
385.1	779	10	Stafino, RV26 (Russia)		224.4	1337	1	Cork (Irish Free State)	
381	788	16	Lwow (Lemberg) (Poland)		219.9	1365	1.5	Béziers (France)	
376.4	797	50	Scottish Regional (Falkirk)		218.5	1373	0.2	Plymouth	
372.2	806	1.5	Hamburg (Germany)		218.5	1373	0.5	Salzburg (Austria). (Relays Vienna)	
370.1	810.5	0.8	Radio, LL, Paris		217	1382	0.5	Königsberg (East Prussia). (Relays Heilsberg)	
368.1	815		Seville, EAJ5 (Union Radio) (1.0 kW.); Galicia EAJ4 (0.2 kW.) (Spain); Bolzano (1.0 kW.) (Italy); Helsinki (10 kW.) (Finland) (relays Lahti); Khar'kov, RV26 (10kW) (Russia).		217	1382	0.25	Karlstad (Sweden)	
					214.3	1400	1	Aberdeen	
					211.3	1420	1	Newcastle	
					209.8	1430	1.25	Magyarovar, Miskolc and Pees (Hungary)	

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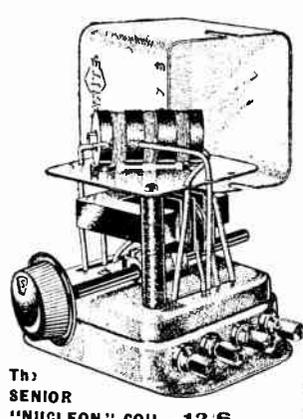
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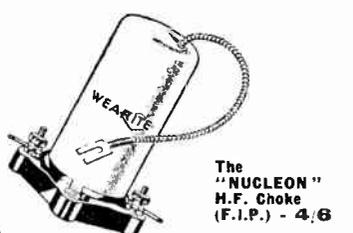
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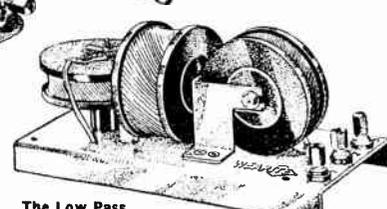
Address .....



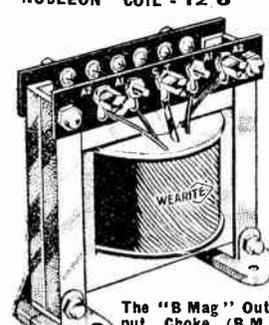
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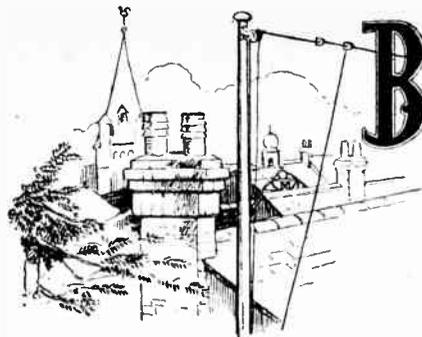
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# Broadcast Brevities

By Our Special  
Correspondent



The *Kinematograph Weekly* remarks that these developments are "of immediate interest to exhibitors and technicians." I should just think so!

## The New Anti-pirate Van

I MAY be wrong, but it seems to me that whenever the Postmaster-General experiments with a new pirate-catching van, he chooses the Newcastle and Sunderland area in which to put it through its paces. Perhaps Newcastle likes this sort of thing.

Why not give Kensington or Wimbledon a chance?

## The Northern Ireland High-power Station

A SITE near Lisburn, close to a large cemetery, has, I understand, been decided upon for the B.B.C.'s new high-power transmitter for Northern Ireland.

Negotiations are practically complete, and designs for the station buildings are now in preparation. The work of construction should begin very shortly.

## Mr. Arthur Burrows: A False Rumour

MR. ARTHUR BURROWS ("Uncle Arthur" of the old British Broadcasting Company days) is issuing a personal denial of the story that he intends returning to England to join the Corporation staff.

This will be disappointing news to the older generation of listeners, who will never



PIPE ORGANS SUPERSEDED? Here is an idea for the B.B.C. furnished by the Vicar of St. Margaret's, Coventry. When the church organ broke down he coupled a microphone and five-valve amplifier to two moving-coil speakers. An old harmonium supplies enough volume to fill the building.

## This Television

THOSE who are looking for excitement should enter the television arena. Everything seems propitious for a battle royal between the rival systems.

Last week, when the "news" was published of the termination on March 31st, 1934, of the Baird agreement with the B.B.C. in connection with the 30-line transmissions, things looked black for the Baird firm. Nothing has been published, however, which indicates any obstacle to the renewal of the contract.

## Things Are Not What They Seem

I will venture to state that prospects were never brighter for the Baird interests, as, indeed, for any British television system, than at the present time.

The B.B.C. has no intention of discontinuing television experiments, and any suggestion that owners of television receivers may find themselves with no transmissions to tune in can be dismissed as untrue.

## A Chat with Captain West

Captain A. G. D. West, formerly of the B.B.C. and H.M.V., and now in sole charge of the technical development of the Baird system, was full of enthusiasm when I chatted with him last week on the Crystal Palace television tests which are now beginning, and to which I was able to make first exclusive reference in *The Wireless World* of July 7th last.

## All About the Crystal Palace Tests

The transmitter, which employs 500 watts, is housed at the base of the North Tower, with a feeder line to the aerial. Very soon a much more efficient transmitter will operate from the South Tower, though the sound programmes may continue from the North Tower on the temporarily allotted wavelength of 155 metres. Later on the sound will be transmitted on between 6 and 6.25 metres, which is the ultra-short wave-band specially allocated for the tests.

For one week the 30-line television will go out on 6.25 metres; then, for a week, 60-line images will be transmitted, followed by a week on 120-lines.

## 180-Line Pictures Soon

Within two months from now the company hopes to be covering all London and, indeed, a radius of thirty to forty miles from the Crystal Palace, with 180-line television, using the latest Baird transmitter, similar to that now installed on the roof of Broadcasting House. In the early stages films will be used, but later on real flesh and blood entertainment will be provided.

## Anxiety in the Cinema Trade

By the way, the cinema trade is displaying a lively interest in J. L. Baird's present experiments in large-screen projection. Already 90-line pictures have been very satisfactorily projected upon a screen 8ft. by 6ft.

forget the pioneers who first put broadcasting on its feet and gave to the early programmes a homely and friendly atmosphere which has been lost for ever.

The hard-worked Secretary of the Union Internationale de Radiodiffusion will always be assured of a warm welcome over here.

## "Am Freiceadan Dubh"

"THE Black Watch" ("Am Freiceadan Dubh"), a play for the anniversary of the regiment, by John Gough, will be relayed from Edinburgh to National listeners on October 24th. This is a chronicle play covering incidents in the history of the regiment between 1740 and 1917.

## Six Telephone Talks

CECIL LEWIS'S "Pursuit," a play in the Radio Drama Festival now in progress, is to be broadcast on October 16th (Regional) and 17th (National). There are no stage directions or word pictures in this play. It starts with six telephone conversations (the equivalent of screen "close-ups"), the intention being to enable listeners to familiarise themselves with the principal characters.

The Radio Drama Festival will continue on October 27th (National) with Lance Sieveking's "Kaleidoscope," which was first heard by listeners in the early years of broadcasting.

## A Friend Abroad

TO tell us what an Englishman thinks of America when on his first visit to "God's Own Country" is the purpose of Mr. S. P. B. Mais's series of talks, "The Modern Columbus," which are to be relayed across the Atlantic on Friday nights at 9.30, beginning on October 13th.

On that night, Mr. Mais's lone voice will be heard in Lexington, Virginia. A week later he will give us his impressions of Jacksonville and Miami, Florida. New Orleans will be visited on October 27th, and our pioneer's subsequent messages will hurtle across from Texas, Arizona, California, Washington, Minnesota, Illinois, Pennsylvania, Massachusetts, and New York.

I shall listen earnestly to discover whether, as the weeks pass by, Mr. Mais's eminently English accent can stand the strain.

## Misunderstood

A ROMAN Catholic missionary tells of an amusing experience the other day when he was touring a new housing estate in the Birmingham area.

At a certain house he put the usual question: "Excuse me, are you R.C. here?" and got the reply: "No, we're A.C., and if it's wireless you're selling, we've got one."

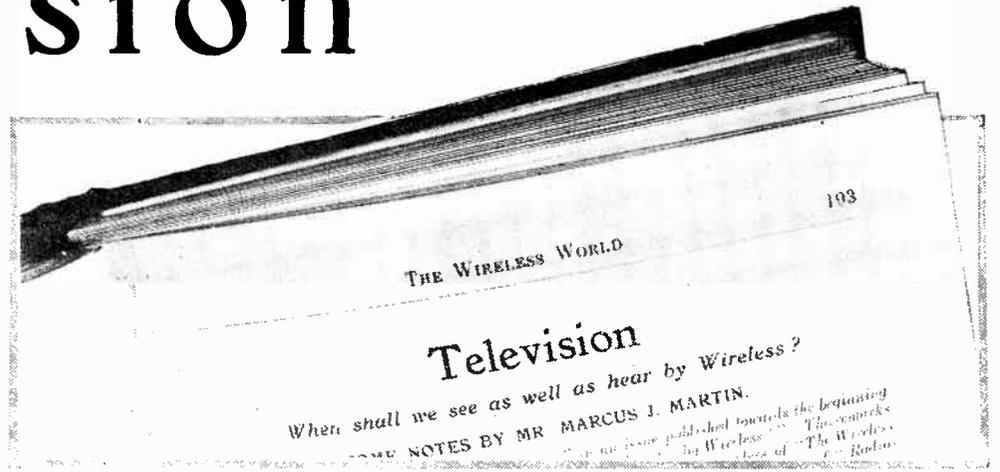
# Television

## Progress

### The Present Stage of Development

*THE time has come when it is opportune to take stock of the present position in television, and in this article we endeavour to present our readers with a picture in proper perspective of the present state of development, with a discussion on limitations of existing systems and the possibilities which lie ahead as a result of recent laboratory progress.*

THE art of television is one of many examples in which invention has outstripped achievement. A glance through the literature of the subject is sufficient to show that practically all of the basic methods of transmitting optical images by electrical means are old in conception, though it is only in recent years that success of a practical kind has been attained. The situation in this respect is somewhat analogous to that of radiotelephony, the advent of which was delayed until the means of



How long ago "The Wireless World" began to take an interest in the possibilities of television is indicated by this reproduction of the heading of an article which appeared in an issue dated June, 1915.

obtaining practical results became available in the shape of the thermionic valve, but the technical difficulties in the case of television are so much greater that the solution of the problem, in terms of communication or entertainment value, is even now barely being approached.

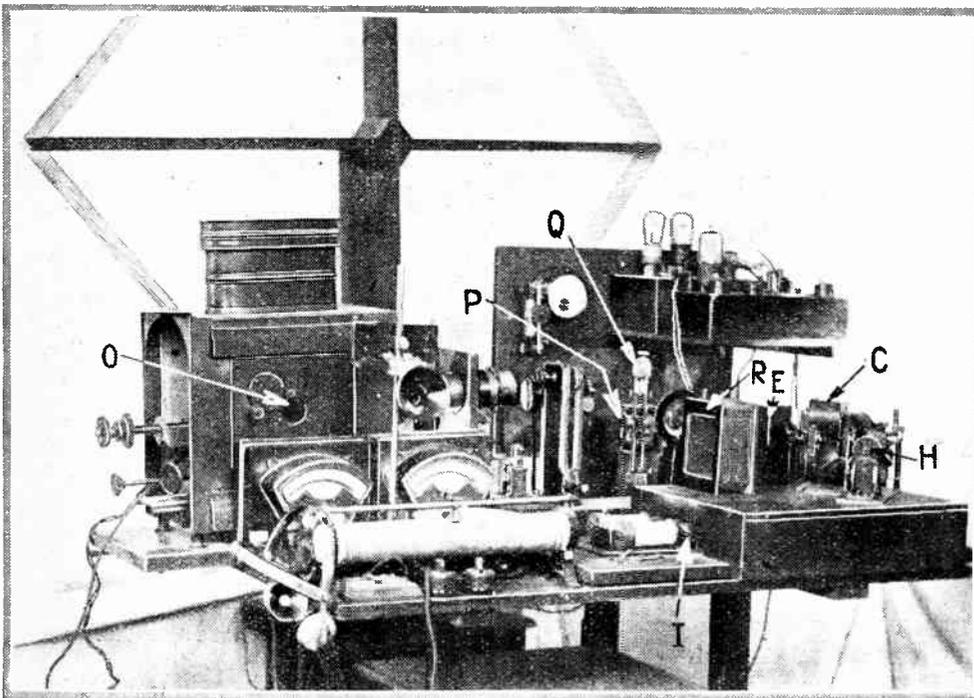
In one sense the present situation is highly favourable to the development of television in a practical form. The public are accustomed to a broadcasting service and are looking forward, perhaps with greater certainty than is justified, to an early date when sight of the same degree of perfection as sound will form a normal part of broadcast transmissions. The enterprise and energy of the Baird Company has led to a service of broadcast television which, at any rate, has whetted the appetites of those who have

received the transmissions, and has proved once more how adaptable are the human faculties to relatively imperfect presentations of the original subject matter. The B.B.C. are also fully alive to the possibilities of television, and the skill with which they have made the most of the limitations of the medium in the present transmissions has completely justified the inauguration of a regular service of the present character.

Having regard to the future of television, we may thus say that there is at the present moment an attitude of expectancy on the part of the public, who consider that the solution is merely a matter of time, and, while this is in itself a stimulus to invention and commercial enterprise, it may also constitute a danger in the measure in which the existing optimism is not warranted by the facts. It is not sufficient to say that high quality television is bound to come, and that it is only a matter of logical development before the television screen becomes as common an object in the home as is the loud speaker at the present date. We must examine the technical justification for such a proposition and face the basic difficulties inherent in the problem, and then, and then only, will we be able to form an estimate as to how much we may reasonably expect.

#### How Sight Differs from Sound Broadcasting

It is perhaps opportune at this juncture to consider the essential difference between the broadcasting of sight and sound, namely, the fact that a visible subject has to be analysed into elements which are successively transmitted as modulations of the carrier wave, and, after reception, synthesised so as to give back again a representation of the original. It is unnecessary to labour this point, which is probably familiar to all readers of *The Wireless World*. A satisfactory analogy is that of a page of a book, which can either be regarded as a visible object, i.e., synthetically, or as a succession of letters,



An early worker in the field of television was a young Hungarian engineer, Mihaly, a description of whose first practical efforts was included in 'The Wireless World' of March 26th, 1924. This photograph appeared in that issue to illustrate some of his apparatus.

**Television Progress—**

i.e., analytically. The eye, in reading the book, is carrying out practically the same function as the scanning apparatus in the television transmitter; when it reaches the end of one line it starts at the beginning of the next, and so on until the end of the page is reached, after which the next succeeding page is started, and so on. For the purpose of this illustration we have to imagine the eye as apprehending only one element at a time, i.e., one letter, and, whereas in the case of a book the difference between the various elements lies in the difference between one letter and another, in the case of television the electrical "eye" takes in the intensity of the light at any point of its sweep across the visible object being scanned.

The process of transmitting visible subject matter over a radio or other communication channel consists in generating electrical impulses from each "line" of the image which is being analysed and transmitting them in sequence over the channel just as they occur. Pursuing our "book" analogy, we may imagine the letters of the book in each line to be set up on a continuous tape, as in a system of printing telegraphy, and caused to generate electrical impulses. If these are received at a distance they may be reconverted into a succession of letters which are then rearranged in the exact manner in which they originally occurred before transmission.

**Synchronising**

It is not proposed in the present article to go into any detail at all regarding the various manners in which "scanning," as it is called, can be carried out. One feature is common to all methods, and that is the use of synchronised apparatus at the transmitting and receiving ends. The need for this will be understood from the "book" analogy; if we imagine the lines of the book to be successively scanned at the transmitter and impulses to be sent over the communication channel corresponding to every letter of each line, it is necessary, for the *immediate* reconstruction of the printed page, to have some apparatus at the receiving end which will set up the successive letters in their appropriate positions. The simplest way to carry out this process is to have the scanning system at the transmitter moving exactly in step with a corresponding system at the receiver. The former system will thus be "looking" at a letter when the latter is "pointing" to the blank part of the page where the letter has to go. If then a signal is sent down the channel which indicates that the letter is required, it will automatically be set up in the right place.

Considering then the actual process of television, we may say that the transmitter embodies an electrical "eye" which systematically "looks" at each successive element of the image to be transmitted, and the receiver embodies synchronised apparatus which is arranged to "point" in a direction exactly corre-

sponding to the picture element at which the transmitter is "looking" at any moment. The intensity of the light falling on the electrical "eye" causes a signal to be sent which regulates the illumination at the spot at which the receiver is "pointing," and in this manner the picture is built up. It is necessary that this process of scanning should be re-

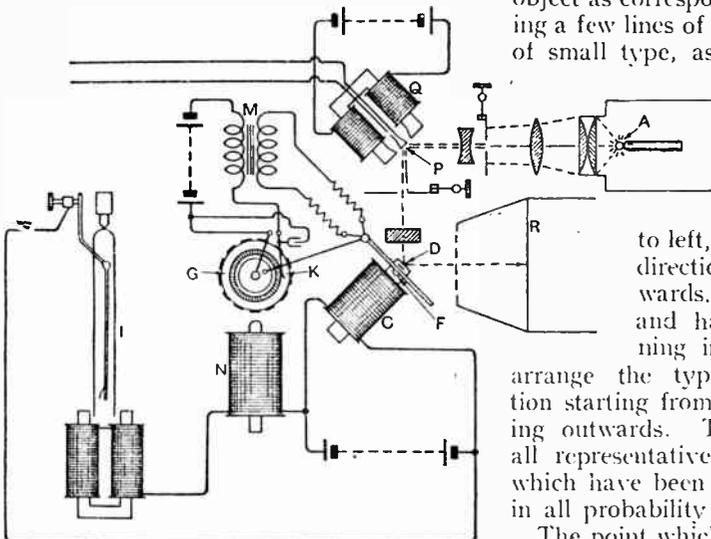
quency of repetition is necessary for practical television, as this constitutes one of the limitations upon the perfection which can be obtained in the final result.

**Methods of Coding**

Reverting to the "book" analogy, it is plain that we may imagine the visible object as corresponding to a page containing a few lines of large type or many lines of small type, as consisting of lines extending over the whole page or divided into columns, as reading normally from left to right or inverted from right

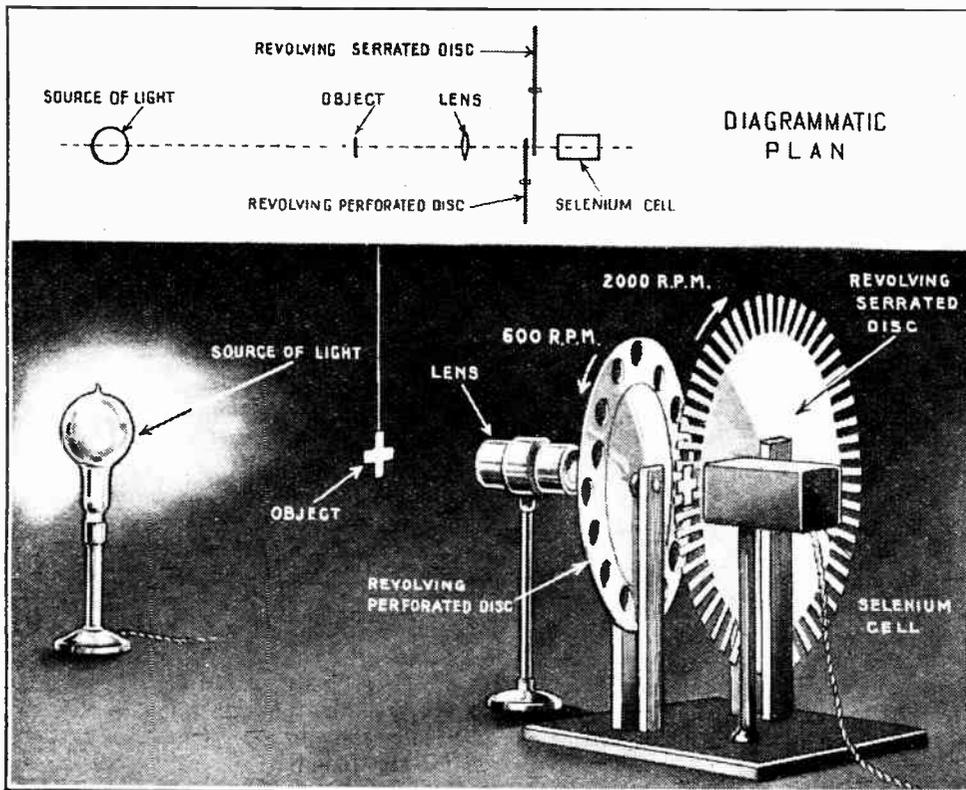
to left, or running in a vertical direction upwards or downwards. We may go further and have alternate lines running in opposite directions or arrange the type in a spiral formation starting from the centre and spreading outwards. These arrangements are all representative of scanning systems which have been proposed and there are in all probability many others.

The point which has to be remembered as of fundamental importance is that in television there is no one way of scanning the object which can be regarded as normal. The visible subject matter has to be coded at the transmitter and decoded at the receiver and, beyond the obvious fact that the systems used for transmission and reception have to correspond to each other, there is not, *prima facie*, any reason why any one method of coding should be preferred to any other. There



The receiver circuit employed by Mihaly.

peated in such a manner that the image is perceived by the eye as continuous, but in this respect the requirements are not materially more exacting than those of a cinema film, though the duration of the illumination of any point is momentary and therefore much shorter than in the film case. It is important, however, to decide what fre-



A drawing which was included in an article in the issue of "The Wireless World," of May 7th, 1924, to explain the principles of the early apparatus used by Baird for the transmission of shadow pictures

**Television Progress—**

is, however, one important aspect and that is the degree of subdivision of the object, i.e., the number of so-called "picture points."

If we take a concrete example in which scanning is, say, from left to right, we regard the picture as being made up of a succession of horizontal lines the thickness of which is just sufficient to fill the whole

to walk before one can run, have been amply justified. In the writer's view, however, in spite of the good results which have been obtained *within the limitations of the system*, the time has come when an increase must be made both in the number of picture points and in the rate of repetition of the picture. We thus arrive at the fundamental difficulty of organising a television service; no

detail have been explored. Any future system may then comprise scanning apparatus giving a finer analysis of the picture and a radio link on a short wavelength where the required side-band width is alone available.

[In a further article the laboratory progress with other systems will be discussed in particular reference to short-wave transmission.]

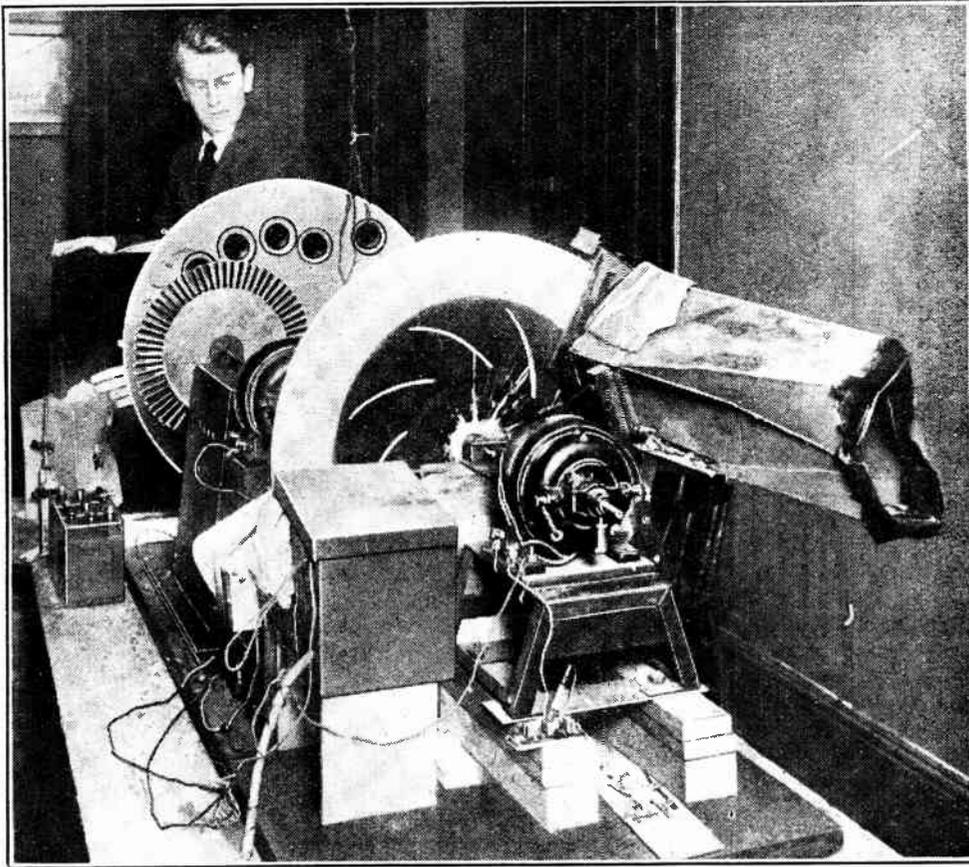
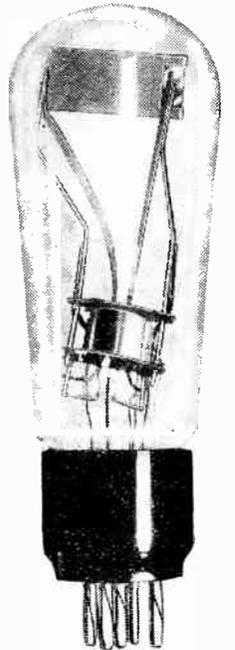
**The Micromesh Tunograph**

**T**HE advent of automatic volume control has led to the development of visual tuning indicators as a means of determining when exact resonance with a station has been obtained, for the action of A.V.C. is such that the ear cannot always be relied upon to select the optimum tuning position. Such indicators may take many forms, but the Micromesh Tunograph is particularly interesting in that it functions on the cathode ray principle—it is, in fact, a miniature cathode ray oscillograph. The tube fits a standard five-pin valve-holder, and its filament is rated to consume 0.85-1.0 ampere at 0.5-0.6 volts; in practice, however, it may be operated from the standard 4 volts A.C. line by connecting a 4 ohms resistance in the filament circuit.

The anode requires a minimum operating potential of 180 volts, which may be conveniently derived from the H.T. supply to the receiver. Two alternative methods of connection are suggested by the makers—in one a resistance is inserted in the H.T. feed to the H.F. or I.F. valve, and the change in potential across this with increasing grid bias is used to operate the Tunograph. With the alternative connections the indicator is fed with the H.F. or I.F. signal potentials, and these cause the cathode ray to vibrate rapidly in a straight line, the length of which is dependent upon the signal strength. This particular connection is probably the more interesting, and tuning is carried out for maximum length of a line of light on the plate into the tube, which must, of course, be fitted in a readily visible position.

The system is of particular interest in that it involves no moving parts, the indication being entirely by the deflection of a beam of electrons impinging upon a special plate which is capable of translating the deflections of the beam into a visible effect.

The Tunograph is manufactured by Standard Telephones and Cables, Ltd., Connaught House, Aldwych, London, W.C.2, and the price is 17s. 6d.



A photograph of Mr. Baird with an experimental television equipment set up in his laboratory in the summer of 1925.

of the area which is being scanned. If the latter be taken as rectangular, the thickness of the lines will be equal to the height of the picture divided by the number of lines, and if we wish the detail of the picture in a horizontal direction to be of the same degree of perfection as that in a vertical direction we may imagine each line to be divided up into squares the sides of which are equal to the thickness of the lines. It is then just possible to transmit a pattern consisting of alternate black and white squares each of which is of the size of one "picture point," but no finer grained picture can be transmitted or reproduced.

The problem of television thus consists in settling, in the first place, what rate of repetition and degree of detail will give rise to a satisfactory picture, and, secondly, in devising apparatus for analysing and synthesising the image of the visible object which is being transmitted and received.

With regard to the first point, there is no doubt that the present Baird transmissions have provided an excellent starting point and, on the basis that one must learn

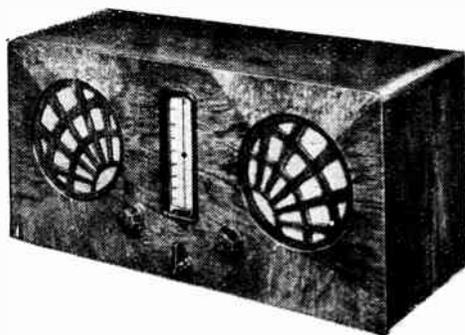
really basic improvement is possible unless the system of transmission is changed, all existing television receivers thus becoming obsolete.

**Wavelength and Present Systems**

However, there is one circumstance which is favourable to the present situation, and that is the fact that no material improvement to the existing television service is worth while if the medium wave broadcasting band is to be used for the radio link. With the present system of transmission it would be desirable to transmit modulation frequencies as high as 20 or 30 kc/s, but, as is well known, a greater side-band width than 9,000 kc/s on either side of the carrier is not possible in view of the congestion of the ether. It is therefore out of the question to increase the picture points unless a change of wavelength is made of such a character that the necessary side-band width can be accommodated, and there is no reason why the present system should not remain as a standard, at any rate until the possibilities of television in finer

# McMichael Twin Supervox

## A Table Model Receiver with Dual Loud Speakers



high-note response is definitely above the average. It is balanced by an adequate medium and low-note response, and, due to the paralleling of the speech coils, this is obtained without any appreciable resonance.

and the turns are spaced. Waverange switching is accomplished by switch units mounted adjacent to each coil and operated by a link motion from the control knob.

All the components are well spaced in the metal chassis, which, with the twin loud speakers, forms a single unit which is easily withdrawn from the cabinet. An interesting feature is the arrangement of the mains voltage adjustment, which is mounted underneath the cabinet and is protected by a metal cover plate.

The valves in the circuit are all of the metal "Catkin" type, and the power rectifier is of the voltage-doubler metal

It is refreshing in these days of stereotyped designs to find a receiver with so many marks of individuality. Not least of these is the well-proportioned and symmetrical cabinet design in which the layout of the controls blends happily with the radiating lines of the twin loud speaker frets and the walnut quartering of the front panel.

Excellent as is the performance of the set from the point of view of range and selectivity, it is the loud speaker reproduction which first attracts attention. There is an effect of spaciousness in the quality which is difficult to define, but which definitely invests the response with a realism which is missing from sets with single loud speaker units. At distances of more than 3 or 4 feet from the set the sound emanates apparently from an area considerably greater than that of the set itself and reproduces to a certain extent the atmosphere of the concert hall.

### Tone Control

The waverange selector switch has five positions—two on medium and two on long waves, and a centre position for gramophone reproduction. The alternative positions on medium and long waves enable the user to take full advantage of the wide frequency range when receiving the local station and to cut down the high-frequency response when interference is experienced from heterodyne whistles or background hiss. In the "controlled" positions there is no suggestion of woolliness, and with the normal setting the

There are two stages of high-frequency amplification without reaction, the first tuned and the second coupled by a special dual choke. The range is better than that of a single-tuned stage with reaction, and, the volume and quality from Langenberg in daylight indicated that the set should fulfil every reasonable requirement from this point of view.

In Central London approximately four channels are lost on either side of the two Brookmans Park transmitters, while on the long waves Königswusterhausen cannot quite be freed from a background either of Daventry or Radio-Paris, though the latter stations are themselves easily separated.

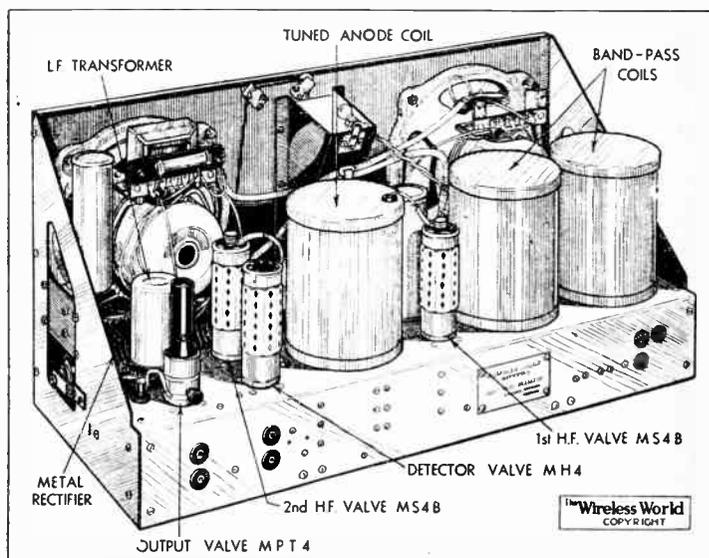
The tuning coils are enclosed in copper screening cans of unusually large volume,

### FEATURES

**Type:**—Four stage open aerial "straight" set for A.C. mains. Twin moving-coil loud speakers.

**Circuit:**—Tuned screen grid amplifier with band-pass input—semi-periodic screen grid H.F.—grid detector—power pentode. Metal oxide rectifier. **Controls:**—(1) Tuning with vertical illuminated dial. (2) Volume and on-off switch. (3) Waverange and tone control. **Price:**—18 gns.

**Makers:**—McMichael Radio Ltd., Slough, Bucks.

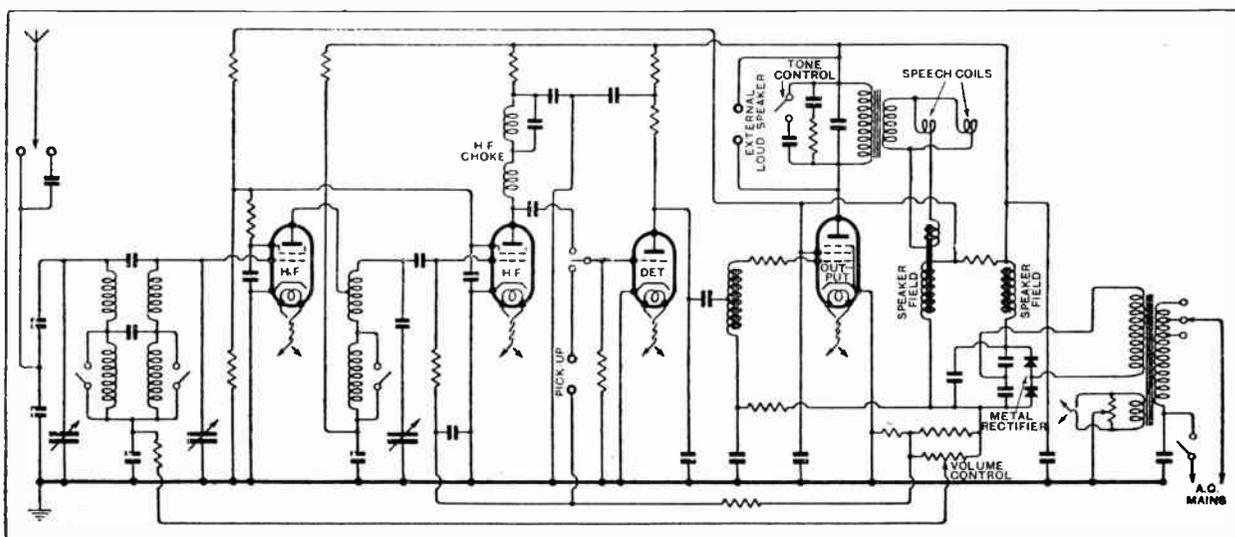


The chassis, showing twin loud speaker units. Osram "Catkin" valves are used throughout.

oxide type. The band-pass input circuit is capacity coupled at the high potential end of the tuned circuits, and the aerial loading is reduced by a capacity potential divider connected across the first tuned circuit. Both H.F. valves are of the ordinary screen grid type, and volume is controlled in the first stage by a potentiometer connected across the common bias resistance in the negative H.T. lead.

The output pentode feeds the twin moving coils through a tone-corrected output transformer. A hum-bucking coil is fitted to one of the units and the field coils are run in series, one acting as a smoothing choke. The arrangement works well, and the level of mains hum is extremely low.

Next Week's Review:  
FERRANTI  
"LANCASTRIAN"  
SUPERHET



Schematic circuit diagram. A special dual choke is used in the second H.F. stage to give uniform overall amplification.

The Wireless World

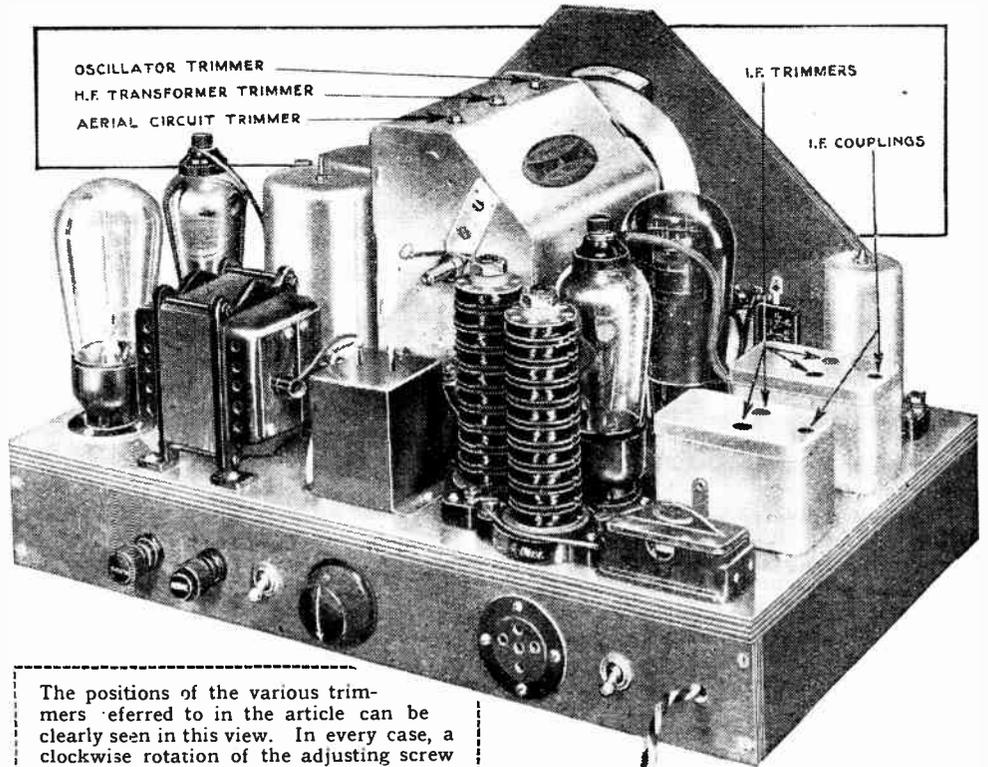
# D.C. SUPERHET

## Constructing and Operating the New Receiver

By W. T. COCKING

**I**N last week's issue, constructional details of the new D.C. superheterodyne appeared, together with a description of the principles upon which its design is based. It will be remembered that the frequency-changer is preceded by a signal-frequency H.F. stage in order to secure high sensitivity without background hiss. This practice leads also to a general increase in the sensitivity, since the use of a band-pass filter at the signal frequency is avoided. The use of the Pentagrid valve as a frequency-changer also gives greater efficiency and so assists in maintaining a silent background. Of even greater importance, however, is the fact that this method of frequency changing leads to substantially constant efficiency over the waveband, and prevents the falling off so often experienced on wavelengths above about 450 metres.

The single I.F. stage in conjunction with the iron-core I.F. transformers provides adequate amplification and selectivity, with the result that it is possible to



The positions of the various trimmers referred to in the article can be clearly seen in this view. In every case, a clockwise rotation of the adjusting screw increases the trimmer capacity

output valve without subsequent amplification.

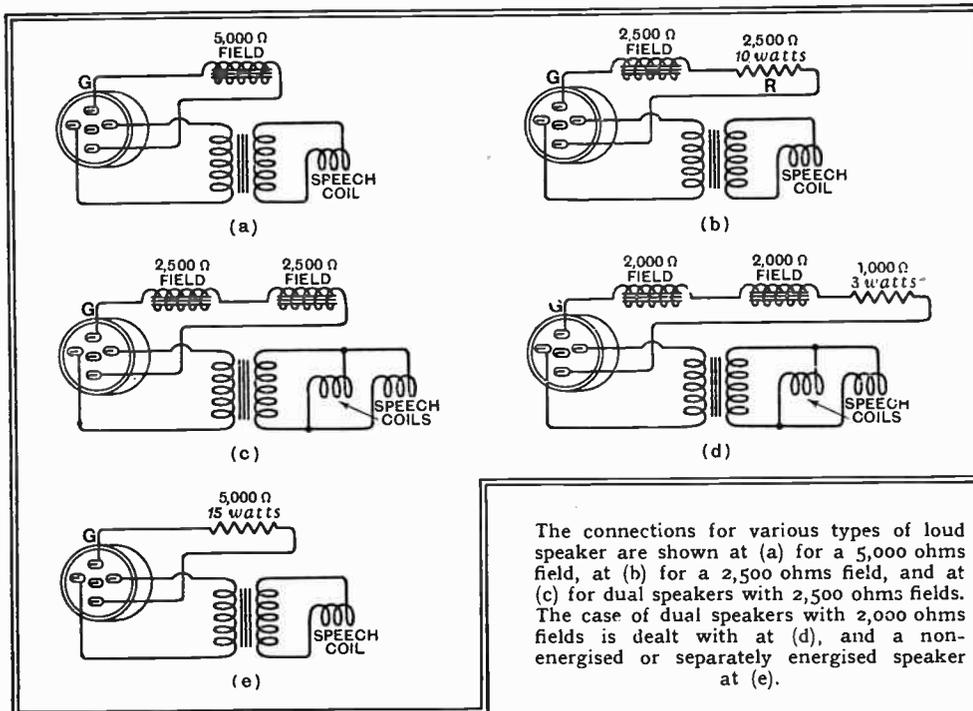
One of the most important practical results of this is the complete absence of

ing; even then quite small changes in the layout may lead to deleterious effects. Owing to the absence of L.F. amplification in this receiver, however, troubles from electrostatic hum pick up are completely absent. It will be seen, therefore, that the set offers marked advantages over other types—advantages which more than compensate for the inability to use a gramophone pick-up.

### Ganging the Receiver

Constructional details have already been given, and it remains to deal with the initial adjustments which must be made before the receiver can give of its best. These comprise the I.F. trimming, the I.F. coupling, and the ganging. A strong signal should be tuned in with a milliammeter connected in series with the bias resistance of the early stages at the point "X" on the circuit. A meter with a full scale reading of 25 mA. or more should be used. In the absence of a signal the current will be the total current of the first three valves, and when a strong signal is tuned in it will drop as the A.V.C. system comes into action. The greater the change of current (the smaller the total current) with a signal, the stronger the signal. Each I.F. trimmer must then be adjusted in turn for the greatest change of current; the coupling screws should be adjusted also for maximum change of current.

The ganging can then be tackled. Set the oscillator trimmer (front section) nearly



The connections for various types of loud speaker are shown at (a) for a 5,000 ohms field, at (b) for a 2,500 ohms field, and at (c) for dual speakers with 2,500 ohms fields. The case of dual speakers with 2,000 ohms fields is dealt with at (d), and a non-energised or separately energised speaker at (e).

feed the second detector with an input of 9 volts or more. Two Westectors, therefore, provide a compact and inexpensive second detector and A.V.C. system, and are capable of fully loading the pentode

hum on normal mains supplies. It is well known that the detector grid circuit causes most trouble in a D.C. mains receiver, and in order to avoid hum it is often necessary to adopt complete screen-

**D.C. Superhet—**

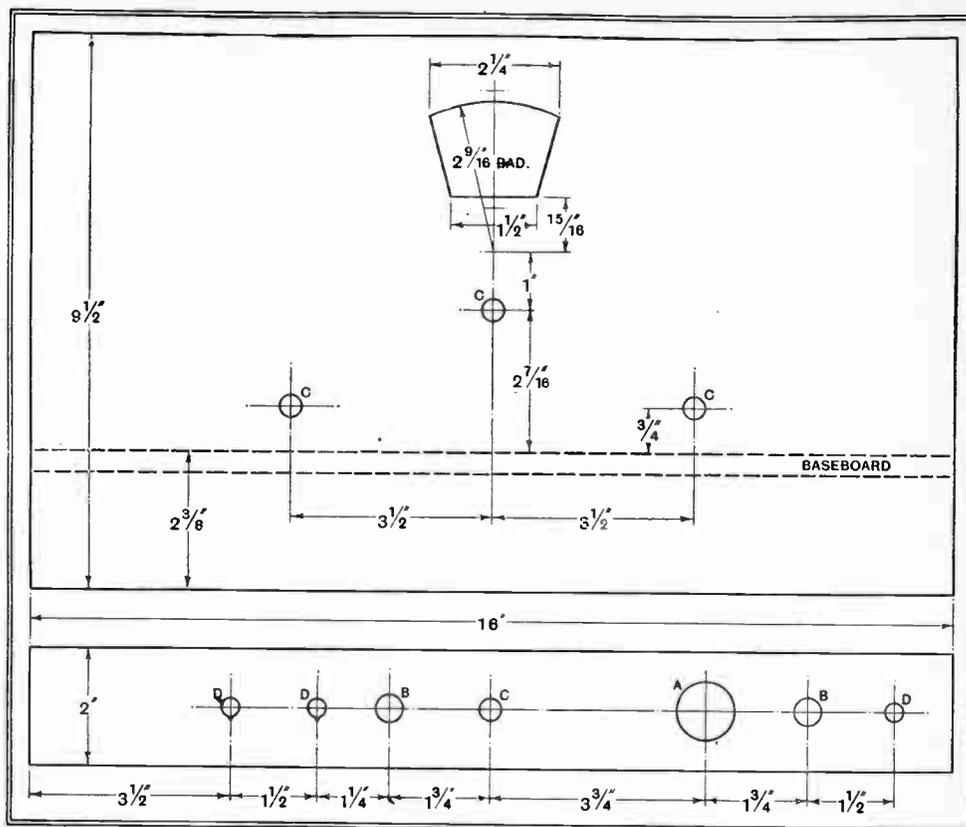
at minimum, tune in a station on as low a wavelength as possible, preferably below 250 metres, and adjust the two pre-selector trimmers for maximum signal strength as indicated by minimum current on the meter. Then tune in a station around 500 metres and adjust the oscillator trimmer while rocking the gang condenser backwards and forwards over a few degrees until the optimum combination of settings be found. Then return to the low wavelength station; and readjust the pre-selector trimmers.

**The I.F. Circuits**

If the dial supplied be of the wavelength calibrated type, the operation may be simplified somewhat by setting the dial to read the wavelength of a local station, such as London National, and then tuning in this station by means of the trimmers. If the calibration be accurate, the ganging should then hold, but it is advisable to carry out the process described above as a check. If no meter be available for an indicator the adjustments can be carried out for optimum signal strength as judged aurally. It will then be necessary, however, to choose weak stations, so that A.V.C. does not come into action.

The long wave ganging is next carried out, and here it is necessary to remove the panel in order to adjust the trimmer, for this can only be reached through a hole in the front of the Radiopak. In most cases only slight adjustment is needed, and it is best done by tuning in a long wave station, such as Radio Paris or Huizen, and adjusting it while rocking the gang condenser backwards and forwards over a few degrees until the optimum combination of settings be found. The panel can then be replaced, for no further adjustment will be required.

The I.F. couplings should next be adjusted for the best quality of reproduction



Drilling dimensions for the front panel and terminal strip of the D.C. Superhet are shown here.

with the particular speaker used. A true band-pass effect is not necessary, since the pentode provides automatic tone correction in conjunction with the average speaker, and the capacity of the by-pass condenser C15 is insufficient materially to affect the quality. It may be found that at certain trimmer settings a motor-boating effect occurs with the manual volume control at maximum on a very strong signal. This is usually a sign that the I.F. circuits are too loosely coupled, for this leads to abnormally high I.F. amplification, and a tendency towards overloading in the I.F. and output stages on a strong signal. The effect is not of great importance, for it occurs only when the output valve is overloaded, and it is not true motor-boating. Its presence can, in fact, be taken as a warning of overloading, and it prevents bad quality from being obtained through the maladjustment of the controls.

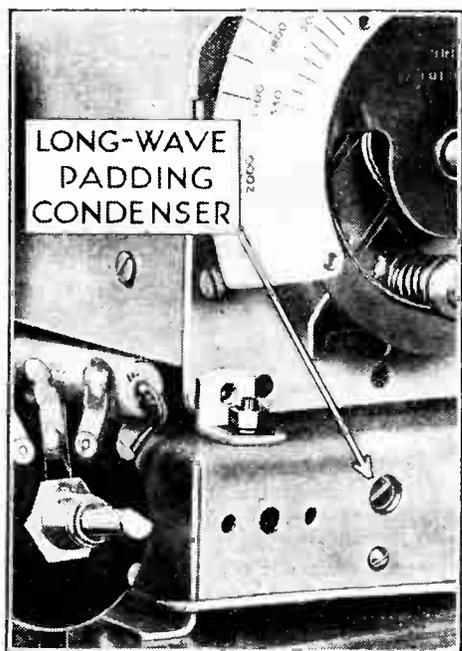
As the speaker field is used to increase the current through the heater of the 6A7 valve, it is important that it should have the correct resistance, or that its resist-

ance should be made artificially equal to 5,000 ohms. The connections for a number of the more common field resistances, therefore, are illustrated, and are self-explanatory. In the case of a non-energised or a separately energised field, a 5,000 ohms 15 watts resistance is needed. As resistances of this high rating are not common, it may sometimes be more con-

*A full-size blue print of the wiring connections is available from the Publishers, price 1/6 post free.*

venient to employ instead two series-connected 2,500 ohms resistances, each of 10 watts rating.

A Table of voltages and currents is included in this article, and it is a wise plan to check over the receiver to make sure that the existing conditions are correct. Even with a mains voltage the same as that used when preparing the Table, variations will occur in individual cases, and discrepancies of 10 per cent. can usually be ignored. With mains of higher



The long-wave padding condenser is operated by a screw which can be reached through a hole in the front of the Radiopak.

**TABLE OF VOLTAGES AND CURRENT.**

Valve.	Anode Volts.	Screen Volts.	Grid Volts.	Anode Current.	Screen Current.
H.F. V.D.S. . . . .	180	80	-2.4	10	0.6
Frequency changer 6A7—					
Tetrode . . . . .	180	80	-2.4	10.7	1.1
Oscillator . . . . .	130	—	—	1.5	—
I.F. V.D.S. . . . .	180	80	-2.4	10.2	0.7
Output D.P.T. . . . .	168	180	-9.1	31	5.8

Mains voltage = 220 volts. Total current = 0.35 ampere. Total power on 220 volts supply = 77 watts. All measurements taken with Avometer, no input signal, and Local-Distance switch at distance. The voltage readings will vary somewhat with different meters, and both voltages and currents will vary lightly with different mains voltages.

**D.C. Superhet—**

or lower voltage, of course, the voltages and currents will vary accordingly. Furthermore, the different loads imposed by different voltmeters will introduce discrepancies, so that it must not be expected that the figures will be exactly reproducible, and they are given chiefly as a guide to the correct operating conditions.

On test the receiver gave a good account of itself. All the principal continental stations gave sufficient detector output fully to load the output valve, and in daylight stations such as Langenberg, Brussels, North Regional, Huizen, Paris, Deutschlandsender, Luxembourg, and Fécamp would all give full loud speaker volume and bring the A.V.C. system into action. This latter circuit proved so effective that little change in volume between the London Regional, at about fifteen miles, and Langenberg was noticeable.

The adjacent channel selectivity was of a high order, and it proved easily possible

to receive the Deutschlandsender clear of any serious interference from Daventry National while using an I.F. coupling adjustment giving exceeding high quality. With sensitive speakers the volume obtainable is adequate for most requirements, and the quality of reproduction proved on test to be of an exceptionally high order. Second-channel interference was negligible, except at two points corresponding to received frequencies lower than those of the locals by twice the intermediate frequency. Background noise was unusually low, and hum was completely absent.

The performance obtained thus amply justifies the policy of increasing the pre-detector amplification and reducing the L.F., for the high quality and absence of hum are to be attributed directly to this. The sole practical disadvantage of the inability to use a gramophone pick-up is a small price to pay for the undoubted advantages of the apparatus as a receiver.

## Letters to the Editor

The Editor does not hold himself responsible for the opinions of his correspondents

Correspondence should be addressed to the Editor, "The Wireless World," Dorset House, Stamford Street, London, S.E.1, and must be accompanied by the writer's name and address

### Eliminating Interference

IN connection with Mr. Willans' letter in your issue of Sept. 8th re split field windings for reducing interference from motors, may I point out that this method has been tried by the P.O. engineers for (as far as I recollect) trams and trolley buses.

In an earlier report (see "Radio Activities," *Elect. Times*, p. 156, July 24th, 1930) this method is said to have been found effective with trolley buses at Birmingham.

It appears that later (Angwin, *Instn. P.O. Elect. Eng. Paper No. 137*) it was found that the distance of the field coils from the feeders tends to reduce the effectiveness—hence the present practice of fitting "stopper coils" to the trolley leads, as close to the feeders as practicable.

London, W.3. S. N. RAY.

### The Control Man Again

MAY I ventilate an old grievance of the listening public, viz., the misdirected operating of output control of certain kinds of music at the B.B.C.? At one time this seriously interfered with the enjoyment of nearly all music. Let me gratefully acknowledge an enormous improvement in this respect, but the nuisance has been revived recently in connection with organ broadcasts. During passages obviously intended to be soft and delicate the power has been increased until background noises were out of all proportion. Then, of course, an unexpected change to more or less full organ caused the control operator to shut off suddenly as if the organist had rapidly closed in his great organ. There is no mistake about this; it happened a short time ago during a recital from Coventry Cathedral, and also in a recital from the Church of the Messiah, Birmingham, neither of which organs are totally enclosed; the organists themselves could not possibly have produced these effects.

Doubtless, in connection with outside

broadcasts, the control engineer is placed in a difficulty, but there is no reason why the primary difficulties in placing of microphones at the source of sound should not be patiently studied and overcome. It would be better to make very soft passages nearly inaudible, or for the organists to be made acquainted with the necessary technique for broadcasting from particular buildings and instruments, than for this irritating sort of adjustment to be made at the engineering control during an item.

London, S.E.20. W. C. BURBRIDGE.

### Television—A Reader's Grouse

IN a recent issue you congratulate yourselves that the B.B.C. took up your suggestion for a television census. If, as you fondly believe, the B.B.C. took the hint from *The Wireless World*, then you are responsible for the most foolish and mischievous piece of work that radio has experienced for some time.

Did it occur to you that in the very middle of the summer not one television enthusiast in ten would have his set in action? Of those who were experimenting the very few would actually catch the announcement concerning the census, owing to the time, which is so short, being devoted to adjustment and alteration of apparatus.

This postcard census would thus in all probability catch about five or ten per cent. of the real television audience.

I can claim acquaintance with about twenty television workers, but I know that only two or three at the most have their sets assembled at the moment.

If a single individual like myself knows some twenty "lookers-in" then surely it is safe to estimate the "phantom" audience at 2,000 at the very least; an estimate like 500, which has somewhere been made, is absurd and shows a complete lack of "touch" with this branch of wireless.

If *The Wireless World* has the "ear" of

the B.B.C. then let us have the request for a postcard given out in *the News Bulletin*; it is the only possible way of getting anywhere near the correct number of "lookers."

In conclusion, if *The Wireless World* wants to have a finger in the television pie, why not do it properly and give us a few television articles. It has, after all, been going as an "amateur" science for some six years!

Southfleet, Kent.

S. FALLOON.

## The Wireless World

### A.V.C. THREE

See Announcement on page 285

#### LIST OF PARTS TO BE USED

After the particular make of component used in the original model, suitable alternative products are given in some instances.

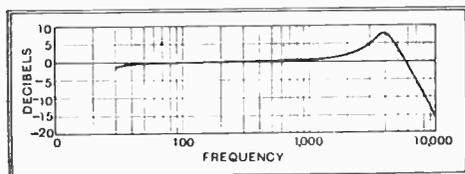
- |   |  |
|---|--|
| 1 3-gang Variable condenser and disc drive  | J.B. "Nugang" No. 2064   |
|   | (British Radiophone, Polar.)   |
| 1 Variable Condenser, 0.002 mfd.  | Ormond R/507   |
| 1 Knob for above  | Ormond R/355   |
| 1 Iron core coil  | Wearite "Nucleon" B.P.1  |
| 1 Iron core coil  | Wearite "Nucleon" B.P.2  |
| 1 Iron core coil  | Wearite "Nucleon" T.G.   |
|   | (Colvern, Varley.)   |
| 1 Transformer   | Multitone "Toco" 1:4   |
| 1 Tone control potentiometer for use with above   | Multitone  |
| 1 Volume control potentiometer, 250,000 ohms, tapered   | Watmel T4  |
|   | (Claude Lyons, Magnum, Rothermel.)   |
| 1 H.F. choke  | Wearite HFP  |
| 1 H.F. choke  | Wearite HFPA   |
|   | (Kinva, McMichael.)  |
| 1 Power smoothing choke, 30 henrys 50 m.a.  | Davenset No. 101   |
|   | (R.I., Sound Sales, Varley.)   |
| 1 Mains transformer, 200 to 250 volts, 50 cycles  |  |
| Secondaries: 275-0-275 volts, 4 volts, 2.5 amps centre-tapped, 4 volts 4 amps, centre-tapped.                 | Vortexion A.C.34   |
|   | (British Radio Gramophone Co., Bryce, Challis, Davenset, Claude Lyons, Sound Sales.) |
| 4 5-pin Valve holders   | Clix Chassis Mounting  |
|   | Air Sprung Type  |
| 1 7-pin Valve holder  | Clix Floating Type   |
|   | (W.B.)   |
| 2 Fixed condensers, 0.0001 mfd.   | Telsen W.207   |
| 1 Fixed condenser, 0.0005 mfd.  | Telsen W.211   |
| 1 Fixed condenser, 0.25 mfd. 500v. D.C. test  | Telsen W.229   |
| 1 Fixed condenser, 0.05 mfd. 500v. D.C. test  | Telsen W.227   |
| 1 Fixed condenser, 1 mfd. 500v. D.C. test   | Telsen W.227   |
| 2 Fixed condensers, 2 mfd., 500v. D.C. test   | Telsen W.226   |
| 5 Tubular condensers, 0.1 mfd. 1,500v. D.C. test  | Telsen W.411   |
| 2 Tubular condensers, 0.005 mfd. 1,500v. D.C. test  | Telsen W.408   |
|   | (Graham Farish.)   |
| 1 Dry electrolytic condenser, 4 mfd. 500 working peak voltage   | Telsen W.396   |
| 1 Dry electrolytic condenser, 8 mfd. 500 working peak voltage   | Telsen W.398   |
| 1 Dry electrolytic condenser, 25 mfd. 25 volts.   | Telsen W.399   |
|   | (Dubilier, Peak, T.C.C.)   |
| 1 Resistance, 200 ohms  | Graham Farish Ohmite   |
|   | 1½ Watts Type  |
| 1 Resistance, 250 ohms.   | ditto  |
| 1 Resistance, 1,000 ohms  | ditto  |
| 1 Resistance, 2,000 ohms  | ditto  |
| 1 Resistance, 7,000 ohms  | ditto  |
| 2 Resistances, 10,000 ohms  | ditto  |
| 1 Resistance, 17,500 ohms   | ditto  |
| 2 Resistances, 20,000 ohms  | ditto  |
| 1 Resistance, 25,000 ohms   | ditto  |
| 1 Resistance, 100,000 ohms  | ditto  |
|   | (Dubilier, Erie, Claude Lyons, Ready Radio, Varley.)                                 |
| 1 Grid leak, 2 megohms  | Graham Farish Standard Type  |
| 1 Grid leak, 0.5 megohm   | ditto  |
|   | (Dubilier, Erie, Claude Lyons, Ready Radio, Varley.)                                 |
| 2 Switches, on-off  | Claude Lyons 728   |
| 1 Switch single-pole change-over  | Claude Lyons 729   |
|   | (British Radiophone, Bulgin.)  |
| 1 5-pin plug  | Bulgin P.3   |
|   | (British Radio Gramophone Co.)   |
| 1 Length screened sleeving  | Harbros  |
| 4 Ebonite shrouded terminals, A., E., Pick-up (2)   | Belling-Lee Type B   |
| Wood panel, ¼-ply, 15in. x 8½in.  |  |
| Plymax Baseboard, 12in. x 15in. x ¾in.  | Peto-Scott   |
| 2oz. No. 20 tinned copper wire, 6 lengths Systollex, Wire, Wood, Paxolin, Flex, etc.                          |  |
| Screws: 19 ½in. No. 4 R/hd., 18 ½in. No. 4 C/sk., 86 ¾in. No. 4 R/hd., 1 6BA 1 in R/hd. with nut and washers. |  |
| Valves:—1 Osram or Marconi MJ1D4, 1 Osram or Marconi MU12, 1 Mazda AC/Pen., 1 Ferranti VPT4, or Mullard VP4.  |  |

# LABORATORY TESTS

## NEW RADIO PRODUCTS REVIEWED

### VARLEY NEW R.C.C. AND NICORE A.V.C. UNITS

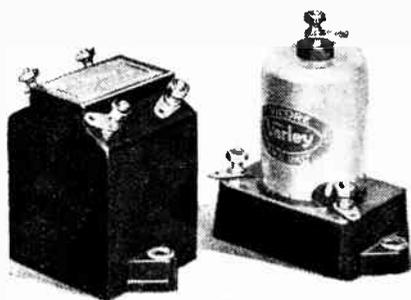
THE Compensating R.C.C. Unit is a resistance-capacity coupling device designed to give correction for the loss in the upper register that invariably accompanies the use of very selective tuned circuits. It



Curve showing order of correction afforded by the Varley Compensating R.C.C. unit.

has a characteristic which is sensibly flat up to 1,500 c/s, after this it begins to rise and eventually attains a maximum at about 3,600 c/s. Beyond this point there is a comparatively rapid decline. Compensation for high note loss is achieved, however, without detracting from its performance over the middle and lower registers for at frequencies up to 1,500 c/s the unit functions as a straightforward resistance-capacity coupling device. To obtain the full measure of correction a valve of comparatively high impedance should precede the unit, and for the purpose of our tests one of 18,000 ohms A.C. resistance was employed. The curve here reproduced shows the degree of compensation that may be expected under normal operating conditions. The unit costs 11s. 6d.

Another new Varley product is the Nicore A.V.C. unit. This enables automatic volume control to be incorporated in almost every type of receiver in a simple manner and with the minimum of alteration in the design or layout of the components. From our tests it would appear that best results are obtained in super-heterodyne receivers, as the A.V.C. volts provided by the unit are greater at the lower carrier frequencies. For with 0.5 volt fed to the grid of a detector valve the A.V.C. volts developed were 7.3 at 110



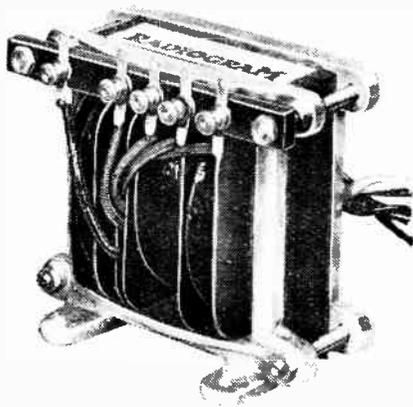
Varley Compensating R.C.C. and A.V.C. units, the latter includes an H.F. choke.

kc/s and 1.75 at 600 kc/s. The A.V.C. unit costs 15s. 6d., and the makers are Varley (Oliver Pell Control, Ltd.), Kingsway House, 103, Kingsway, London, W.C.2.

### BRITISH RADIOGRAM MAINS TRANSFORMER

A MAINS transformer for use in receivers embodying two or three valves and an A class rectifier has been sent in for test by the British Radio Gramophone Co., Ltd., Pilot House, Church Street, Stoke Newington, London, N.16. This component is listed as the Type 55 and provides 250+250 volts at 60 mA, 4 volts at one amp. for the rectifier filament and 4 volts at 3 amps. maximum for the A.C. valves. The primary is tapped for supply mains of from 200 to 250 volts, the various leads from this coil being brought out to a terminal strip. Terminals are not provided for the secondary windings but the leads are left sufficiently long to join to their respective points and a colour scheme is adopted for identification.

On test the smoothed D.C. output was found to be 338 volts at 10 mA, 316 volts



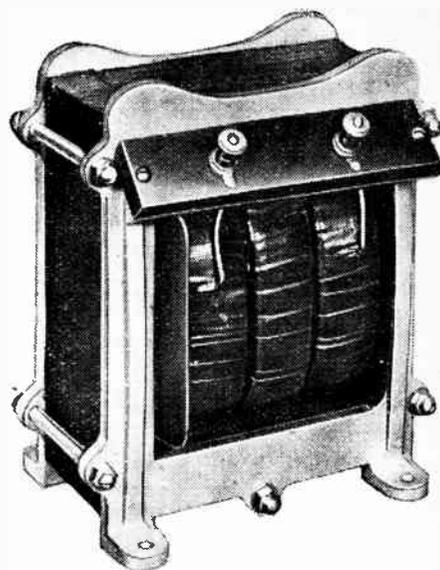
British Radiogram A type mains transformer model 55

at 20 mA, 296 volts at 30 mA, 278 volts at 40 mA, 260 volts at 50 mA, and 243 volts at 60 mA. The smoothing choke had a resistance of 300 ohms, and 4-mfd. condensers of 400 volts working were used. The H.T. secondary is well regulated and accounts for a 5 per cent. voltage drop only on full load. Under these conditions the rectifier filament was operated at 3.83 volts while 3.81 volts were given at 3 amps. by the remaining L.T. winding. These are just within the tolerance permitted for the A.C. valves, but precautions must be taken to avoid voltage drop in any extension of the filament leads.

The transformer is strongly made, the inter-winding insulation is very good, there is no indication of over-heating and the price is 21s.

### K-P SMOOTHING CHOKO

MADE by K-P Instruments, Aerial Works, Blackheath, London, S.E.3, the type 20/100 smoothing choke is one of a new range introduced for heavy duty work, the model in question being rated to carry up to 100 mA of D.C. while maintaining an inductance of the order of 20



K-P heavy-duty choke model 20/100.

henrys. The choke is assembled on a massive iron core, the coil being in three sections, each separately insulated and wound with silk covered wire of heavy gauge. Its D.C. resistance is low, being but 165 ohms, so that when passing the maximum current of 100 mA the potential drop across the choke amounts only to 16.5 volts.

Measured at 50 c/s and with 5 volts A.C. applied to the choke its inductance with various amounts of D.C. flowing is as follows:—

D.C. in mA.	Inductance in Henrys.
0	38.4
20	37.3
40	36
60	33.8
80	31
100	26

The well-maintained inductance is due largely to the very generous size of the core, but it is further assisted by the inclusion of an air gap, and from our measurements it would seem that

this gap has been correctly chosen having regard to the magnitude of the D.C. currents the choke is intended to carry.

The workmanship and finish are of an exceptionally high standard and at 39s. 6d. the choke represents excellent value for money. This firm manufactures also a range of mains transformers of the same quality in addition to which they are in a position to supply these components wound to customers' specifications.

## The Radio Industry

THOSE interested in the performance obtainable with modern sets should note that demonstrations are now given by Haynes Radio at Queensway, Enfield, Middlesex, every Friday evening from 6.30 to 9.30. All types of receiver in the firm's range of products, including short-wave sets, are demonstrated in the Servicing Department.

The premises can be reached by train to Enfield Town or Enfield Chase, thence by train along Southbury Road.

### Catalogues Received

Radio Instruments, Ltd., Purley Way, Croydon, Surrey.—Catalogue of R.I. components, with technical data, particularly with reference to the new "Micron" iron-cored tuning coils.

City Accumulator Co., Ltd., 18-20, Norman's Buildings, Central Street, London, E.C.1.—Full descriptions of the C.A.C. receivers, and also illustrations of many attractive cabinets, including one for the New Monodial. In loose-leaf form.

# READERS' PROBLEMS

## Earth Everything

IT is wise to make it a rule, when building a receiver, to earth all metal objects that would otherwise be "free." This applies to such things as coil covers, transformer shrouds, condenser containers, and the metal braiding of screened wires.

It should be remembered that the necessary earthing is generally provided automatically when a set is assembled on a metal chassis. A reader, who proposes to use a wooden framework for a design where metal was originally specified, should remember this point and provide the necessary extra earthing connections.

## Negative or Positive ?

A READER, who intends to supplement his present H.T. supply (obtained from a 100-volt house-lighting battery) with a 50-volt accumulator battery, asks for advice as to whether the extra cells should be connected on the positive or negative side of the mains. Neither side is earthed.

This is probably not a matter of any great importance, but we recommend that connection should be made as in Fig. 1 (a). Results could certainly be obtained from the alternative form of connection shown in diagram (b), but the results of an accidental earth connection on the mains or of leakage would be to impose a complete or partial short-circuit across the high-tension battery.

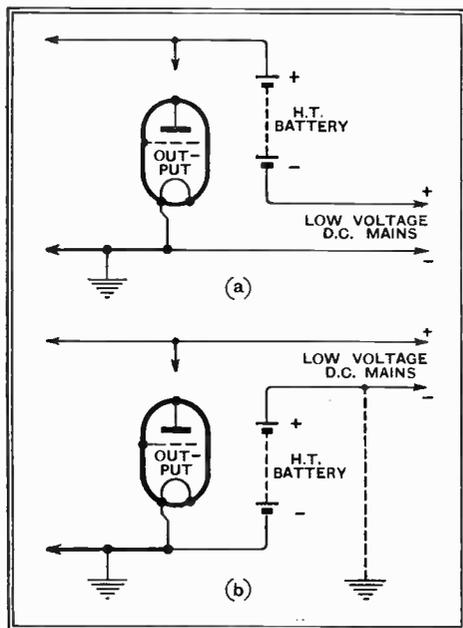


Fig. 1.—How to connect a supplementary H.T. battery in series with a house-lighting system. Diagram (b) shows, by dotted lines, how a short-circuit may be introduced by connecting the battery incorrectly.

This short-circuit would take place through "earth" by the path indicated in dotted lines, but it could admittedly be prevented by earthing the set through a condenser.

## Bias Affects Voltage

A CORRESPONDENT seems to be slightly perturbed because the reading of a voltmeter, which is semi-permanently connected across the main H.T. output of his eliminator, shows slight but quite definite voltage changes when the output valve grid bias is altered experimentally.

THESE columns are reserved for the publication of matter of general interest arising out of problems submitted by our readers.

Readers requiring an individual reply to their technical questions by post are referred to "The Wireless World" Information Bureau, of which brief particulars, with the fee charged, are to be found at the foot of this page.

We would reassure him by saying that, in the circumstances, some slight variation in voltage is inevitable, though with large and generously designed power equipment it may be barely perceptible. By increasing bias the output valve anode current is reduced, and so it is natural that a voltage rise should take place in the eliminator.

Conversely, the output valve will tend to take more current when its bias is reduced, and so a fall in voltage is to be expected as a result. No ordinary eliminator can be expected to maintain an absolutely constant voltage under varying loads.

## If the A.V.C. is Working

THE only practicable way of making a definite test of the working of a "delayed" automatic volume control system is to insert a milliammeter in the anode circuit of one or more of the controlled valves; the current registered by the meter will, if everything is well, fluctuate in sympathy with the strength of all incoming signals above a certain critical intensity.

It is worth while knowing that, in the absence of a meter, fairly conclusive proof of the proper functioning of the control is afforded by the fact that background noises are greatly reduced in strength when the set is tuned to a strong carrier wave; the stronger the carrier the quieter the background.

Conversely, of course, noises should increase on tuning the circuits to a wavelength on which no transmission is taking place. In this condition all the controlled valves will be working at maximum sensitivity, as automatic control can do nothing to desensitise the set unless a steady carrier wave is being received. Naturally, these remarks do not apply to sets with "quiet" A.V.C. but few include a fully automatic system of this type.

This simple test is suggested to a reader who is using a factory-built set in which it is inconvenient to insert a meter; our querist suspects that the automatic control system has developed a fault.

## The Wireless World INFORMATION BUREAU

THE service is intended primarily for readers meeting with difficulties in the construction, adjustment, operation, or maintenance of wireless receivers described in *The Wireless World*, or those of commercial design which from time to time are reviewed in the pages of *The Wireless World*. Every endeavour will be made to deal with queries on all wireless matters, provided that they are of such a nature that they can be dealt with satisfactorily in a letter.

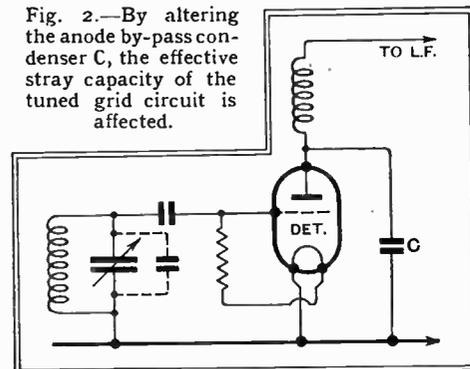
Communications should be addressed to *The Wireless World* Information Bureau, Dorset House, Stamford Street, London, S.E.1. and must be accompanied by a remittance of 5s. to cover the cost of the service. The enquirer's name and address should be written in block letters at the top of all communications.

## Anode By-pass Capacity

FROM the point of view of sensitivity, a much larger by-pass condenser than usual may with advantage be shunted between the anode of the detector valve and earth. In fact, if the question of quality be ignored, one may go on adding to its capacity almost indefinitely with some advantage; the only exception to this is that reaction control may become impossible after a certain limit is exceeded.

A correspondent who appreciates these points has tried the effect of increasing his detector anode by-pass capacity with disappointing results. The addition of a relatively large parallel condenser (C in Fig. 2) had no obvious effect.

Fig. 2.—By altering the anode by-pass condenser C, the effective stray capacity of the tuned grid circuit is affected.



We are inclined to think that this correspondent has ignored the fact that, by adding capacity in this position, the grid circuit tuning of the detector valve has been disturbed. His receiver is gang tuned, and he would be well advised, after making any alteration that is likely to upset tuning, to readjust the detector grid circuit trimming condenser. It is not always realised that, due to its effect on input capacity, an alteration in the anode circuit may make this course necessary.

## Defective at One Wavelength Only

INFORMATION is requested as to the probable nature of a fault which manifests itself by an intermittent noise or even by a momentary cessation of signals over a narrow waveband (approximately 380-395 metres). Apart from this trouble, the set, which embodies a "straight" two-H.F. circuit, is entirely satisfactory.

We can think of no more likely cause of this trouble than a short-circuit in one or more sections of the ganged tuning condenser. Very possibly there is some trifling defect, such as a small projecting piece of metal on one of the condenser vanes, which introduces a complete or partial short-circuit at one setting only.

## A Less Effective Filter

IN the new Monodial receiver, heterodyne whistles may be avoided in almost every case by switching into circuit the low-pass filter which is included in the L.F. amplifier. This is an important part of the design, and we would strongly dissuade readers from fitting some less perfect form of filter.

High-note filters of the more usual and simpler type may admittedly offer a certain amount of immunity from interference, but will be less effective than a proper filter, and, worse still, will impair quality to a much greater extent.



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MH4	High Magnification Detector A.C. Mains Valve 13/6	
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"CATKIN" is the Trade Mark of The M.O. Valve Co Ltd., manufacturers and patentees.

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For particulars of Box Number Advertisements and Deposit System see previous issues.

## RECEIVERS FOR SALE.

4-VALVE Screen Grid Portable, 1934 model, as new; cost £15/15, accept £4/5.

7-VALVE Rees, Mace "Superhet" Portable, with Celestion moving coil, new valves and batteries; cost £43/10, accept £7.

"WIRELESS World" 2-valve, with "Epoch" moving coil, in real mahogany case, as new, best parts, new H.T. and L.T., cost £9/10, accept £3/19/6; T.C.C. 10 mfd. condenser, 5/-; 5 mfd., 4/-; 2 mfd. Helsen, 1/-; 4 mfd. T.C.C. (non-inductive), 5/-; Box 8259, c/o The Wireless World. [3609]

MURPHY 4 A.C., 4 months old; £10, near offer; need Radiogram.—Cowley, "Bath Tavern," Asylum Rd., Peckham, S.E.15. [3594]

PHILLIPS Super Inductive Five, 110-250 A.C.; listed £24/3, sale £14; demonstration—5, West Side, Wimbledon 34/0. [3606]

PHILLIPS Model 630A, almost new; cost 23 guineas, accept £10, or near offer; heard evenings.—Jasper, 3, Eaton Rise, Faling, W.5 [3603]

FILM INDUSTRIES L.S.5, with large theatre horn, nearly new, little used; £12/10.—Wright, 59, Stamford Rd., Newport, Shropshire. [3618]

OSRAM Four New Music Magnet Set, and all-electric power unit, valves new in August, tested by G.E.C.; £8/8.—Gable Cottage, George V Ave., Worthing. [3616]

COLUMBIA 5-valve Portable, model 303, complete as new, 4 guineas; 30 ditto, less valves and batteries, to clear at 20/- each.—Rogers, Radio, Lowestoft. [3587]

"WIRELESS World" Superheterodyne Short Wave Amplifier, 25/4/30 complete with meter and two Mazda valves, unused; £2.—Price, 11, Wallacre Rd., Wallasey, Cheshire. [3595]

16-VALVE Wireless Set, 220 volts A.C., Super-het, 15-2,000 metres, matched dual loud speakers, 12 spare valves, only 3 months old; £25, or near offer.—Box 8247, c/o The Wireless World. [3593]

8 Guineas.—Etha-trope 200-240 A.C. 2 S.G. det. and pentode, automatic tuning in walnut cabinet, with valves and moving coil speaker; listed 23 guineas, unopened; c.o.d., carriage paid.—Kav 167, City Rd., London, E.C.1. [3506]

A.V.C. Monodial, 6 watts power unit, valves, components as specified, new Celestion dual speakers, built 2 months ago, guaranteed perfect; any trial; highest offer accepted.—O'Donovan, 126, Kensington Park Rd., W.11. Phone: Park 8794. [3607]

SUPERHET, 10 valves, 17-2,000 metres A.V.C., 100-250v. A.C., 7 watts output, chassis and speaker, £16; rebuilt Columbia D.C.4 transportable, 44/10; H.M.V. 520 radiogram, D.C., £10.—Newbury's Radio, 46, Mayes Rd., Wood Green, N.22. Near Underground Stn. [3634]

ARMSTRONG.—Latest 1934 Universal A.C. D.C. 4v. chassis, incorporating gramophone amplifier, 3 tuned circuits, approximately 9 kilocycles separation, giving superheterodyne performance, 1½ watts output, 75/-; with 5 valves, 14/-; fully guaranteed; approval willingly; chassis as above, 2½ watts output, A.C. working only, 5/- extra.—Armstrong Co., 100, King's Rd., N.W.1. [3612]

PUBLIC Address Equipment by M.P.A.—2 B.T.H. Universal gramophone motors, Senior pick-ups, 50 watt amplifier, single stage microphone amplifier, screen grid and detector for radio, present tuning, all units in steel cases, illuminated control panel, 4 switched outputs, Universal A.C. operation, 3½ in. mahogany cabinet; cost £180, my price £18.—L. Eastwood, 70, Pitfield St., Hoxton, N.1. [3589]

## MAINS EQUIPMENT

N.P. for all Sizes of Battery Chargers, A.C. mains; trade list.

N.P. Allow 7 Days in which to Test the Efficiency of their instruments.

N.P.—Seen on page 22 display; this is our 2-circuit outfit.

N.P. Have a Special Charger, 75 volts, ½ to 2 amps., will charge up to 80 batteries at one time; cost 6 hours full load per unit, £6/6.

N.P.3 Circuit Chargers, will do 250 batteries for 2/6 current; lowest prices in the trade; 2 years' guarantee.

N.P. Send Full Trade Lists and Photographs; state your requirements; now is the time to get busy.—Nash Products, Ltd., Stechford, Birmingham, 9. [3567]

TANTALUM for A.C. Chargers, H.T. and L.T.—Blackwell's Metallurgical Works, Ltd., Garston, Liverpool. [3448]

MARCONIPHONE A.M.7 Mains Unit, new rectifying valve, output 200v. 5 Ma., 4v. 4a., 0.8v. 4a., 6v. 1a.; £4.—Evans, 13, Spencer Rd., East Molesey, Surrey. [3623]



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1 BRITISH RADIOPHONE Super H.F. Radiopak, without volume control	3	15 0
2 COLVEREN Ferronart (colverdynes, 110 kh/s)	1	5 0
1 CLAUDE LYONS Type P.68 5,000 ohm potentiometer	1	5 6
1 CLAUDE LYONS Type 250 tapered volume control, 0.25 megohm	6	6 6
1 GOLTONE Type SHF screened H.F. choke	4	0 0
2 GOLTONE Type PHF mains H.F. chokes	15	0 0
1 HEAYBERD No. 752 L.F. choke	12	6 6
5 CLIX chassis mtg. type 5-pin valveholders	3	9 0
1 T.C.C. Type 65 4 mfd. fixed condenser, 250 v. D.C. working	1	7 0
1 T.C.C. Type 30 2 mfd. fixed condensers, 200 v. D.C. working	2	0 0
3 T.C.C. Type 250 tubular type, 0.1 mfd., 350 v. D.C. working	4	0 0
1 T.C.C. Type M 0.01 mfd. fixed condenser	2	0 0
8 IGRANIC Type FF.12, one each 0.001 mfd., 0.002 mfd., four 0.0001 mfd., two 0.0002 mfd. fixed condensers	4	6 6
1 T.C.C. Type 521 dry electrolytic condenser, 500 mfd.	3	0 0
1 CLAUDE LYONS B.A.T. 728 make and break switch	1	0 0
1 CLAUDE LYONS H.A.T. 2728 double-pole single-throw switch	1	3 6
2 BELLING LEE Type "B" ebonite-shrouded terminals, A & E	1	0 0
2 WESTINGHOUSE W.6 Westectors	15	0 0
1 CLAUDE LYONS Type FW.25 25-ohm resistor	1	6 6
9 SERADEX Type M150 1½-watt resistances: one each 100 ohm, 250 ohm, 20,000 ohm, 1 meg., 5 meg., 1 meg., 2 meg., two 25 mcr.	6	0 0
2 SERADEX Type G250 10,000 ohm 2½ watt resistances	3	0 0
1 BULGIN Type "OB" bulb, 6 volts 0.15 amp.	7	6 6
1 BELLING LEE Type 1033 twin safety fuseholder, with 1 amp. fuses	2	6 6
1 Length of HARBROS screened sleeving	9	9 9
1 OSRAM Barretter No. 251 voltage regulator	12	6 6
4 oz. No. 20 tinned copper wire; 10 lengths Systoflex wire wood screws, etc.	5	0 0
1 PHILCO Type No. 27/6005 7-pin valveholder	1	0 0
1 PHILCO Type No. 407 grid clip for 6AT valve	2	3 6
1 BRITISH RADIO GRAMOPHONE 5-pin plug	2	3 6

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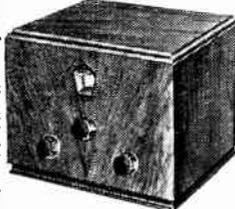
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GUARANTEED 12 Months, and within 5% normal and 2½% stop models, neat shrouding, with detachable feet, as used by Government Departments, etc., etc.

VORTEXION D.C.4 Choke, specified for D.C. superhet; 8/6.

VORTEXION Transformers, tested with 2,000 volts between windings.

VORTEXION.—New monodial transformer, 200-250, 50 cycles, 425-0-425, 120 m.a., 4v. C.T. 3a, 4v. C.T. 1a., 4v. C.T. 1a., 4v. C.T. 6a., screen primary, open type, 20/-; shrouded, 22/-; super shrouded, 26/-; weight 14 lb., carriage 2/- extra; 10 henry choke, 5/6, post 9d.; 20 henry, 8/6.

VORTEXION.—Ferrocart III, 350-0-350, 60 m.a., 4v. 2.5, C.T., 4v. 3.5, C.T.; open type 13/6, shrouded 16/-; post 9d.

VORTEXION.—250-0-250, 4v. 1 to 2a., 4v. 2 to 4a.; open type 10/6, shrouded 12/6; post 9d.

VORTEXION.—Super model for H.T.8 or 9 or 10, 4v. 1 to 2, 4v. 2 to 4; open type 14/6, shrouded 16/6; post 1/-.

VORTEXION.—2½-watt Monodial A.V.C. model; open type 14/6, shrouded 16/6; post 1/-.

VORTEXION.—5-watt Monodial A.V.C. model, 400-0-400, 1½ m.a., 4v. 6a., 4v. 3½a., 4v. 2, 4v. 1a., super screened; 20/-, shrouded 24/-.

VORTEXION.—350-0-350, 120 m.a., 4v. 2 to 5a., 4v. 2 to 4a., 4v. 2.5a.; open type 14/6, shrouded 16/6.

VORTEXION.—400 or 450 or 500v., 120 m.a., 4v. 2 to 5, 4v. 2 to 5, 4v. 2 to 5; open type 19/-, shrouded 23/-.

VORTEXION.—400 or 450 or 500, 150 m.a., 4v. 4a., 4v. 2.5, 4v. 2, 4v. 2, 4v. 2, core size 2½in. x 1½in., a superb job, 2% regulation, 35/-, shrouded with terminals, less terminals 30/-, open type 26/-; post 1/3.

VORTEXION Auto Transformers to B.E.S.A. Specification, 100, 110, or 120v. to 200, 220 or 240 volts, 60 watts, 7/3, post 9d.; 120 watts, shrouded 12/6, open type 10/6, post 1/-; 200 watts, open 14/6, shrouded 16/6, post 1/-; 500 watts 30/-, 2,000 watts £4/10.

VORTEXION 600-watt Transformers; £4/10, carriage free.

VORTEXION 30h. at 60 m.a. Chokes, 5/6; 40h. at 60 m.a., 8/6; 30h. at 150 m.a., 200 ohms, 10/6 open type, 12/6 shrouded

VORTEXION Transformers Made to Your Specification; price according to wattage, 6v. filaments same price unless wattage grossly exceeded; special quotations by return.

VORTEXION (S. A. BROWN), 182, The Broadway, Wimbledon, S.W.19. Tel.: Liberty 2814. [3572]

HOYNE'S Transformers and Chokes the Best Obtainable perfect insulation, regulation and reliability. HOYNE'S Transformers used by many well-known set manufacturers after testing all others.

HOYNE'S Transformers fitted with tapped and screened primaries, filaments all centre tapped, stout cast aluminium clamps and clearly marked terminal strips are fitted to all models.

HOYNE'S Components are guaranteed for one year; built to your own specification at very competitive prices.

HOYNE'S Components.—The components you will eventually use, start right; a dud cannot pass the Hoyne test.

HOYNE'S New Monodial Super, aluminium chassis, drilled for components, complete with Power Transformer, two chokes, push-pull intervalve transformer and valve holders, 51/-, carriage paid.

HOYNE'S New Monodial Transformer, 425-0-425v. 120 m.a., 4v. 3a, 4v. 1a., 4v. 1a., 4v. 6a., 24/-; post 1/3; weight 10lb. 10 henry choke, 6/-, post 6d.; 20 henry choke, 7/6, post 6d.

HOYNE'S.—250-0-250v. 60 m.a., 4v. 1-2a., 4v. 2-4a., 10/-, post 9d.; with extra 4v. 1-2a. winding, 12/6, post 1/-.

HOYNE'S Ferrocart Model.—350-0-350v. 60-70 m.a., 4v. 2-3a., 4v. 2-4a., 12/6, post 1/-; with extra 4v. 1-2a. winding, 13/6, post 1/-.

HOYNE'S.—350-0-350v. 120 m.a., 4v. 2-3a., 4v. 4-6a., 4v. 1a., 4v. 1a., 16/-, post 1/3.

HOYNE'S.—500-450-0-450-500v. 140 m.a., 4v. 2-4a., 4v. 4-6a., 4v. 2a., 4v. 2a., 27/6, post 1/3; weight 11lb.

HOYNE'S.—0-110-135v. 90 m.a., suitable for H.T. 6 or 7, 7/6, post 9d.; with 4v. 2-4a. winding, 9/6, post 9d.

HOYNE'S.—200v. 200 m.a., 4v. 2-4a., 4v. 1-2a., for H.T. 8, 13/6, post 1/-.

HOYNE'S.—Auto Transformers, Chokes and Filament Transformers always in stock.

HOYNE'S Components still have no equal.

M. J. HOYNE, Offices and Works, 8a., Gladstone Rd., Wimbledon, S.W.19. Tel.: Liberty 3303 [3455]

100 Accumulator Chargers, ½ amp., 2-6v., in ventilated metal case (Arden 1932), incorporating Westinghouse rectifier, 10/6, postage 6d.; 1½ amp., 21/-; 7 days' trial.—Arden Agency, Wollaston, Wellingborough. [3548]

A.C. or D.C. Chargers for 2 to 200 Cells at Low Prices; state requirements; dynamos and rotaries in stock, all sizes: Brown's Genometer, battery superseders for H.T. for 2v. or 6v. input, 37/6 and 52/6; television and sewing machine universal motors, 25/-; lists.—Electradix Radios, 218, Upper Thames St., E.C.4. [0398]

## CABINETS.

RADIO-GRAM Cabinets; fully illustrated list free; remarkable values.—Gilbert, Cabinet Maker, Swindon. [1686]

THE New "Jus-Tone" Can be Supplied with Either Walnut or Hexine Covered Cabinet.—Baker, Selhurst Radio. [3637]

EPTON Leads Agair!—Handsome walnut polished Consolette cabinets; Atlas, 11/9; Regentone, 12/6; Aerodyne, 13/6; Alba, 14/- See also "Components" and "Valve" Sections.—Epton 93, New Rd., Chingford, E.4. [3629]

Cabinets.—Contd.

MANUFACTURER'S Clearance Line of Cabinets for Radiograms, loud-speakers, and radio sets; hundreds to select from; send postcard for list; special: cabinets for Skyscraper and S.T.400.—H. L. Smith and Co., Ltd., 289, Edgware Rd., London, W.2. [3409]

DYNAMOS, ETC.

F.D.C. Rotary Converter, 230v. D.C. input 230v. 50-230 watts A.C. output, in soundproof cabinet, as new, with filter unit: £10. Apply Knights Radio Stores, Leigh Rd., Leigh-on-Sea. [3550]

GRAMOPHONES, PICK-UPS, ETC.

GARRARD Induction Motor, B.T.H. Senior pick-up: £3.-98, Village Way, Beckenham; evenings. [3526]

LOUD-SPEAKERS.

THE New "JustTone" the 3 in 1 Speaker.—Baker, Selhurst Radio. [3638]

THE New "JustTone" Speaker Matches any Receiver.—Baker, Selhurst Radio. [3636]

B.T.H. RK Moving Coil Speakers, guaranteed new, unused, manufacturers' surplus, original price.

6 Guineas, highly sensitive and wonderful tone response, will handle up to 10 watts output, available for 6v., 100v., 200v. D.C., 30/-. Also A.C. models

£2/10; carriage paid, c.o.d. or cash with order; the best value in speakers obtainable to-day.—O. H. Seckamp, First Avenue House, High Holborn, London, W.C.1. Phone No. Holborn 6609. [1425]

10/-—Lamplugh Silver Ghost, 2,200 ohms, with output transformer, unopened; list 47/6; c.o.d., carriage paid. Kay, 167, City Rd., London, E.C.1. [3351]

MARCONIPHONE Giant P.M., 35/-. pair matched Rolas, 27/6; R.C.A. 2A.7 valves, with holder clip, 13/6.—Newbury's Radio, see under Receivers. [3635]

OPPORTUNITY! Magnavox (Benjamin) dual "Magnas" D.C. 152/148, 2,500 megohms, boxed, unused; 63.-151, Wellingborough Rd., Northampton. [3632]

30/-—B.T.H., R.K. moving coil speakers, 6in. cone, new and unused, guaranteed; these speakers are the type as used in cinema sound equipment; suitable for public address work; weight 30lb., and are vastly superior to the cheap speakers now on the market, 100 volts, 150 volts, and 200 volts D.C.

27/6—6-volt D.C. speakers, as above; £2 7 6 speaker as above for 100-250 volts A.C., complete with field rectifier.

B.T.H. Transformers, brand new, ratios 1-1, 2-1, 20-1, and 30-1 microphone; 7.-each

CARRIAGE Paid, cash with order, or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3626]

CHAL-ELECTRIC Offer New Boxed Set Manufacturers' Surplus Rola Speakers, all fitted huy buckers, state for power or pentode: F6, 110-175v. (2,000 ohms), 90-130v. (2,500 ohms), 150-200v. (4,700 ohms), 200-250v. (6,500 ohms), list 47/6, at 25/-. each; F7, voltages as above, list 47/6, at 35/-. permanent magnets, F6, P.M., list 49/6, at 28/-.; F7, P.M., list 43/-. at 33/-.; dual compensated (2) F6, list £3/10, at £2, or (1) F6 and (1) F7, list £4/5, at 47/-.; few Class B; state requirements; all goods carriage paid; cash with order, or c.o.d.—Chal-Electric, 6, Conduit St., London, W.1. [3524]

VALVES.

THE M.R.D. Co. Invite You to Test any of their New Range of British Made Valves. All valves guaranteed six months; carriage paid.

TWO-VOLT Range.—VM/SG 7/6; SG/2 7/6; L.F.2. Det2, HF2; RC2, 3/6; Driver, 4/-. Power, 4/6; PEN.2, 10/-. Class B, 1/-. watts, 9/-. Class B, 3 watts, 9/6.

A.C. Range.—VM/SGA, 12/6; SGA, 12/6; DET.AC, 7/6; LF.AC, 7/6; P/AC, 8/6; PEN.AC, 15/-. Details and characteristics on request.—Mains Radio Development Co., 4-6 Muswell Hill Rd., London, N.6. [3583]

FINEST American, all types; 6/- to 8/-. etc.; lists.—Evans, 26, Moss Grove, Uruston. [3623]

VALVES All types American screen grids, etc., in stock; send for quote.—Midmay Radio Exchange, 24, Midmay Grov. London, N.1. [3531a]

ALL Classes of Valves in Stock, including American and non-iron valves; send for price list.—R. Newman, 309, Romney Rd. London, E.3. [3446]

EPHON Leads Again! Latest types of battery and mains leads; in stock; send for list; see also "Cabinets" and "Components" Sections, Epton, 93, New Rd., Chingford, E.4. [3630]

ALL Latest Types of Valves in Stock, including the following brand new American valves, first-class makes: 6A7s, 10/6; 247s, 235s, 224s, 236s, 237s, 235s, 245s, 244s, 12.-; 227s, 226s, 280s, 245s, 9/6; 242s, 232s, 11/-.; T.X.210s, 15/-.; T.X.250s, 7 watts output, 16/-.; 281s, 14 6/-; post paid, cash with order or c.o.d. Send for valve list, Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3627]

SPECIAL Offer.—Valves by world-famous Continental manufacturers, fully guaranteed, screen grid, variable mu screen grid, high magnification screen grid, low magnification screen grid, H, HL, L, RC, power, super power, directly heated pentode, directly heated power pentode; all the above standard mains type, 4/6 each; 300v. 60 milliamp. rectifier 5/6, 350v. 120 ma. 6/6 500v. 125 ma. 7/6; the following 4 volt battery valves at 2/- each, H, HL, L, power, screen grid.—Premier Supply Stores, 20-22, High St., Clapham, S.W.4. Macculey 2188. [3582]

COMPONENTS, ETC., FOR SALE.

R. SELECTED Parts or Sale, as new, any c.o.d. or "Wireless World" deposit system, which we recommend if in doubt as to the splendid value offered; we take risk of damage in transit to customers; goods tested for values and guaranteed.

M. Amode Converter, 6v. to 200v. 40 m.a., perfect, new in February, £3 10; Philips 6-amp. charger, complete, 70/-; Morrison 6-amp. charger, 2 line and H.T., £5/10; B.T.H. senior P.M., with transformer, £3/10; P.A. set, with radio, 10w A.C., entirely complete, modern, £20; Ferranti portable meter, 250v. 10v. 100 m.a., 200 ohm, per volt, 45/-. [3627]

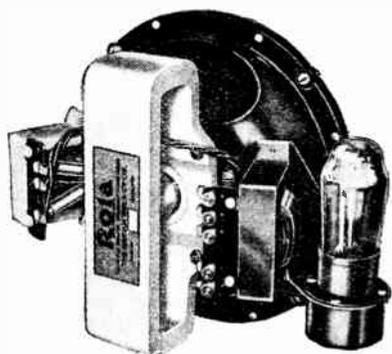
WESTINGHOUSE H.T.1 with R.1. Transformer, 25/-.; Weston 250v. A.C. meter, large commercial type, 20/-.; Weston portable A.C. voltmeter, multi range, £3; Edison 1-amp. charger, 17/6; Vortexion 250v. 120 m.a., 4v. 2 amp., 4v. 7 amp., 6v., 15.-; Ferranti S.4.V. transformer, 10/-.; Ferranti E.M.1 H.T. eliminator, 200v. 100 m.a., 90/-. [3627]

(This advertisement continued in third column.)

# Get 5 times the Volume from your present Battery Set

In 5 seconds any battery set owner can get about 5 times the present volume from his existing receiver simply by connecting a Rola Class B Speaker Amplifier Unit. No alteration to the set is necessary.

## ROLA Class B Speaker Amplifier Unit



Model A—FOR MULLARD P.M. 2B, B.T.H. PD220, COSSOR 220B, STANDARD 13 B1, HIVAC B220, MARCONIPHONE B21, G.E.C. B21, CLARION B22.  
Model B—For COSSOR 240, FERRANTI HP2, CLARION B24.

PRICE 57/-. (Both Models less Valve)

This comprehensive range of Class B Units covers the characteristics of every make of Class B Valve. For high quality reproduction their supremacy is unchallengeable.

For MULLARD P.M. 2B, B.T.H. PD220, COSSOR 220B, STANDARD 13 B1, HIVAC B220, MARCONIPHONE B21, G.E.C. B21, CLARION B22

ROLA FR5—PM—33—Class B	29 6
ROLA FR6—PM—23—Class B	39 6
ROLA F6—PM—23—Class B	49 6
ROLA F7—PM—23—Class B	60 -

For COSSOR 240, FERRANTI HP2, CLARION B24.

ROLA FR5—PM—32—Class B	29 6
ROLA FR6—PM—22—Class B	39 6
ROLA F6—PM—22—Class B	49 6
ROLA F7—PM—22—Class B	60 -

All Prices include Transformer.

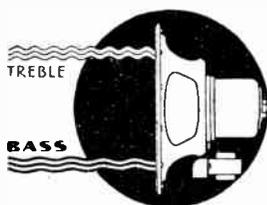


THE BRITISH ROLA CO. LTD., Minerva Road, PARK ROYAL, N.W.10.

Phone: Willesden 4322-3-4-5.

### ROLA SPEAKERS

for better Radio Reception



Radio Data Charts. For the keen amateur. By post, 4/10.

Components, etc., for Sale.—Contd.

(This advertisement continued from first column.)

RYALL'S Mains Transformers, 250v. 60 m.a., 4v. 1 amp., 4v. 3 amp., 10/6; 350v., 12/9; H.T.7/12 13 with 4v. 4 amp., 10/6; H.T.8, 12/9; 4v. 3.5 amp., 8/9; 4v. 3 amp., 6/9; chokes, 20H, at 100 m.a., 8/9; 15H, at 60 m.a., 6/9; resistance 230 ohms, 25H, at 60 m.a., 6/9; resistance 430 ohms, 40H, at 100 m.a., resistance 300 ohms, 10/6.

WE Hold a Large Stock of First Class Radio Apparatus, meters, resistances, heavy chokes, in addition to the goods advertised.

SPECIAL Offer of 3v. and Rectifier (valve) Chassis, from Vascorbin, all guaranteed, new and very well made; chassis only 50/-; with valves, 90/-, carriage forward.

METERS, moving coil, made for Ryall's Radio, guaranteed one year, and to B.E.S. first grade specification, all panel flush type, bakelite cast, 0.5 m.a., 0.20 m.a., 0.50 m.a., 0.150 m.a., 21/- each; 0.250v. 32 6/-; 0.300v. 35/-; 1,000 ohm per volt, zero adjuster, size 3 1/4 in.

METERS, as above, moving iron, first grade, air damped, zero adjuster, 0.250v. A.C. 18/-; 0.50 m.a. A.C. and D.C., 15/-; non damped, without zero, 0.12v., 10/-; 0.250v., 12/-; 0.5 amps., 10/-; 0.20 m.a. A.C. and D.C., 10/-; 0.50 m.a., ditto.

SUITCASE Type Cases, in best crocodile leather, 14x14 1/2 x8, ample room for 12in. turntable and pick-up, 10/-; set cabinets for 3v. A.C. sets, room for speaker, good appearance, 10/-.

B.T.H. Junior A.C. Speaker, with corrugated cone, separate rectifier, 67/6; Epoch 99 6v., 47/6.

T.C.C. 2 mf., 350v. working, 1/6; T.C.C. 1 mf. type 84, 1/3; T.C.C. 0.01 mica, type M, 1/-; T.C.C. 250v. working, 4x4, 4/9; ditto, 4x4x1x1x1/2, 5/9; T.C.C. 15 mf., 100v. working, electrolytic, 1/3.

B.T.H. Universal Senior Gramophone Motors, A.C. or D.C., new, complete with auto stop and all fittings; 55/-.

POLAR Star 3-gang Condensers, 15/-; with drive, 17/6; Polar Knob 2-gangs, with cover and drive, new, 10/6; Radiophone 4-gangs, 12/6; with cover and drive, 17/6; Radiophone 4-gang superhet. type, screwcap, with trimmers, Radiopack type, 9/-, post 9d; Lotus new 4-gangs, 15/-.

RYALL'S RADIO, 33, Chancery Lane, London, W.C.2 (near St. Tube, Chancery Lane, bus 37 passes door, or tram to Savoy St.), Holborn 3529. Open Saturday afternoon. Close 7 p.m., Saturday 6 p.m. Thursday closed 1 o'clock.

R. PREMIER [3600]

PREMIER SUPPLY STORES Offer the following Set Manufacturers' Surplus New Goods at a fraction of the Original Cost, all goods guaranteed perfect, carriage paid over 5/-. under 5/- postage 6d. extra (Ireland, carriage forward).

ELIMINATOR Kits, including transformer, choke, Westinghouse metal rectifier, T.C.C. condensers, resistances and diagram, 120v. 20 m.a., 20/-; trickle charger 8/- extra; 150v. 30 milliamps with 4v. 2.4 amps. C.T., L.T., 25/-; trickle charger, 6/6 extra; 250v. 60 milliamps with 4v. 3.5 amps. C.T., L.T., 30/-; 200v. 100 milliamps with 4v. 3.5 amps. C.T., L.T., 49/6; 300v. 60 milliamps with 4v. 3.5 amps. C.T., L.T., 37/6.

SPECIAL Offer—Reiss type microphone with transformer, a really professional job, listed at £12; our price 52/6.

HEAVY Duty Variable Resistances, wound on porcelain, 2,000 ohms 1-4 amp., 500 ohms 1-2 amp., 120 ohms 1 amp., all the above values, 3/6 each.

T.C.C. Condensers, 750v. working, 2 mf. 3/6, 4 mf. 6/-, 4 mf. 400v. working 4/-, 250v. working 1 mf. 1/-, 2 mf. 1/9, 4 mf. 2/6, 1,500v. working Standoff insulators 0.5 mfd. 1/6, 2 mfd. 6/-, aqueous electrolytic 440v. working, 4 mf. 3/-, 8 mf. 3/6.

1 mf. 1,000v. working, 1/6.

ALL the Following Lines 6d. each or 5/- per dozen: 4- and 5-pin chassis mounting valve holders; shielded screen grid or pentode leads, 1-watt wire end resistances, any value; T.C.C. 0.1 condensers; hum fingers; on-off switches pushpull; polar ranging devices.

POLAR 3-gang 0.0005 Condensers, split end vanes, totally screened disc drive; 6/11.

AMSCO Triple-gang 0.0005 Condensers, with trimmers, 4/11.

KOLSTER BRANDES Gramophone Motors, dual type, can be worked by clockwork or mains, No. 1 induction type 100-250 volt, 27/6; No. 2, A.C. and D.C., 100-250 volts, 27/6; both the above complete with all fittings and turntable.

SPECIAL Offer.—Microphones by prominent manufacturer, high sensitivity, uniform response, complete with stand, transformer and battery; listed £3/15, our price 18/6.

DUBILIER Condenser 500v. working, 4+4+2+2+2+0.1 +0.1+0.1; 6/-.

PREMIER British Made Meters, moving iron, flush mounting, accurate; 0.15, 0.50, 0-100, 0.250 milliamps, 0-1, 0.5 amps., all at 6/-.

ORMOND Condensers, 2 gang semi shielded, 2/6.

WESTERN ELECTRIC Mains Transformers, input 200-250 volt, output 500-0.500 volt, at 150 milliamps, 4v. 4a., 4v. 2.5a., 4v. 2a., 4v. 1a., 4v. 1a., massive job; 19/6.

T.C.C. Electrolytic Condensers, 100 volts working, 15 mfd., 1/3.

SPECIAL Offer of Mains Transformers, manufactured by Philips, input 100-115v. or 200-250v., output 180-0.180 volts, 40 m.a., 4v. 1a., and 4v. 3a., 4/6; 200-0.200v., 4v. 1a., 4v. 3a., 4/6.

ALL Premier Guaranteed Mains Transformers have engraved terminal strips with terminal connections, input 20-250 volts, 40-100 cycles, all windings paper interleaved.

PREMIER H.T.8 Transformer, 250v. 60 m.a., rectified, with 4v. 3.5a. c.t. L.T. and screened primary, 15/-; with Westinghouse rectifier, 25/-.

T.C.C. 2,000+2,000 Electrolytic 12 volts working; listed 27/6, at 10/-.

PREMIER H.T.9 Transformer, 300v. 60 m.a., rectified, with 4v. 3.5a. c.t. L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.

PREMIER H.T.10 Transformer, 200v. 100 m.a., rectified, with 4v. 3.5a. c.t. L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.

(This advertisement continued on next page.)

# How many new notes

will a Hartley-Turner Speaker give you

That depends upon your present equipment; but even if this is better than usual you will get

roughly 36-3 octaves

Two more octaves in the bass and one in the treble

That's what

## HARTLEY-TURNER

gives you!

**DEMONSTRATIONS** any time by appointment.

If you cannot call, write for our **32 PAGE BOOKLET** "New Notes in Radio"

Enclosing 1½d. stamp.

### HARTLEY-TURNER RADIO LTD.,

Thornbury Rd., Isleworth, Middx.

Telephone: Hounslow 1854.

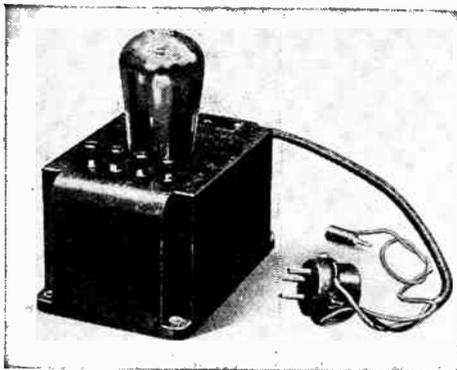
## No Battery Set is up-to-date without CLASS-B.

The Best way to convert—The Easiest way to convert—The Accepted way to convert—is by the

### SOUND UNIT

(The first of its kind)

or by **SOUND SALES** famous TRANSFORMERS and CHOKES



Read all about Class-B conversion in "The Wireless World" Supplement.

There are two ways of obtaining a Mains performance from your Battery Set:

1. Just plug-in the **SOUND UNIT**. Price 35/-
2. Incorporate **Sound Sales Class-B** (less valve) Transformers and Chokes.

Whether converting to Class-B or to Mains Operation you need the best components. Write for **Sound Sales List "W"** of Class-B Unit and Speaker Components, Power Transformers, etc.

**SOUND SALES LTD.,**

Tremlett Grove Works, Junction Road, Highgate, N.19

### Components, etc., for Sale.—Contd.

(This advertisement continued from previous page.)

**P**REMIER Mains Transformer, output 135v. 80 m.a., for voltage doubling, 8/6; 4v. 3-4a. c.t. L.T., 2/- extra; Westinghouse rectifier for above, giving 180v. 30 m.a., 8/6.

**P**REMIER Mains Transformers, output 250.0-250 volts, 60 m.a., 4v. 1-2a., 4v. 2-3a., 4v. 3-4a. (all c.t.), with screened primary, 15/-.

**P**REMIER Mains Transformers, output 350.0-350 volts, 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary; 15/-.

**P**REMIER Mains Transformers, output 400.0-400 volts, 100m.a., 4v. 4-5a., 4v. 2-3a., with screened primary; 15/-.

**P**REMIER Auto Transformers, 100-110, 200-250 volts or vice versa, 60-watt, 7/9; 100-watt, 10/-.

**S**PECIAL Offer of Manufacturers' Type Transformers, any input, output 250.0-250 volts, 60 m.a., 4v. 1a., 4v. 3a. (both c.t.), 8/6; H.T.8 transformer, with 4v. 3-4a. (c.t.), 8/6; with rectifier, 18/6.

**A**MPLION Mains Transformers, input 100-250 volts, output 350.0-350 volts 120 m.a., 4v. 5a., 4v. 2a., 6v. 1a. (all c.t.); 17/9.

**F**ILAMENT Transformers, polished and engraved terminal boards, N.P. terminals, 4v. 3-4a., 5/1; 10v. 3a., 6/6; 12v. 1a., 5/1; 4v. 4-6a., 6/6; 14v. 4a., 6/6; 22v. 1a., 6/-; 6v. 2a., 5/1; 9v. 1a., 5/1; 35v. 3a., 15/-.

**P**REMIER Chokes, 40 m.a., 25 hys., 4/-; 65 m.a., 30 hys., 6/-; 150 m.a., 30 hys., 10/6.

**P**YE Chokes, 20 or 32 hys., 4/-; Premier multi-ratio output transformers, giving 15 different ratios, 7/6.

**P**REMIER Eliminators, input 200-250 volts, 40-100 cycles, A.C., incorporating Westinghouse metal rectifiers, output 250v. 60 m.a., S.G. and 120v. taps, 42/6; with 4v. 4a. c.t. L.T., 7/6 extra.

**B**RITISH RADIOPHONE Wire Wound Potentiometers, with mains switch incorporated, 5,000 ohms, 10,000 ohms, 50,000 ohms, 100,000 ohms, 250,000 ohms, any value; 3/6.

**P**REMIER Eliminators, output 150v. at 30 m.a., S.G., and 100v. taps, with 4v. 3-4a. c.t. L.T., 37/6; or with trickle charger, 42/6.

**P**REMIER Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps, 27/6; with L.I. trickle charger incorporated, 35/-.

**P**REMIER D.C. Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps; 15/-.

**A**CCUMULATOR Chargers, 200-250 volts A.C., all incorporating Westinghouse metal rectifiers; 2, 4, and 6v. at 1/2 amp., 12/6; 2, 4, and 6v. at 1 amp., 17/6; 12v. 1a., 27/6; 6v. 2a., 35/1; 12v. 2a., 35/1; 12v. 1.5a., 30/-; 6v. 3a., 39/6; 30v. 1a., 42/6; 50v. 1a., 62/6.

**A**MPLION High Inductance Chokes, resistance 2,500 ohms, 80 henries, 60 m.a.; 5/6.

**W**ESTINGHOUSE Metal Rectifiers: 120v. at 20 m.a., 6/6; 180v. at 30 m.a., 8/6; 8v. at 1/2 amp., 6/6; 6v. at 1 amp., 9/6.

**B**T.H. Induction Type (A.C. only) Electric Gramophone Motors, 100-250v., 30/- complete.

**A**MPLION Moving Coil Speakers, type F.M.644, dual fields, 2,500 and 5,000 ohms (100 and 200v.), with output transformer, 12/6; A.C. conversion kit for this speaker, 10/- extra.

**W**ESTERN ELECTRIC Condensers, 250v. working, 1 mfd. 6d., 2 mfd 1/-; 500v. working, 1 mfd., 1/-.

**T**C.C. Condensers, 250v. working, 4x4x1 mfd., 3/6; 6x4x2x2 mfd., 375v. working, 6/11; 4x4x1, 6/-.

**S**PECIAL Offer of Wire Wound Resistances,—4 watts, any value up to 10,000 ohms, 1/-; 8 watts, any value up to 15,000 ohms, 1/6; 15 watts, any value up to 50,000 ohms, 2/-; 25 watts, any value up to 50,000 ohms, 2/6; 50 watts, any value up to 50,000 ohms, 3/6.

**W**IRE Wound Potentiometers, 15,000 ohms, 1/6; Centralab Potentiometer volume controls, 50,000 ohms, 2/-; Colerstats, logarithmically wound Potentiometers, 6,000 ohms, 1/3.

**F**OR Callers Only.—The following valves, guaranteed new:—

**T**HE Last Few Western Electric 3211-D Valves, 10v. 3a. filament, 750-1,000v. plate, 50-65 m.a., impedance 3,500 ohms, amplification factor 12; cost £5, to clear at 15/-.

**P**HILIPS 328 Valves for L.T. Charging 5/6; 329 Barretter Lamps, 2/-.

**P**REMIER SUPPLY STORES, 20-22, High St., Clapham, S.W.4. Macalys, 2188. Closed 11 o'clock Wednesdays. Open to 9 o'clock Saturdays. Nearest Station, Clapham North Underground.

**P**REMIER. [3576]

**P**EPPER'S Final Clearance Sale, October 7th to 20th.

**O**WING to the Success of Our Manufacturing Side, we are closing down our surplus dept; all goods must be cleared.

**H**UGE Quantity of Guaranteed Goods.—Example: Bakery's 1933 S.P.M. speakers, 32.6 each (listed 90/-); special bargains for callers

**T**REVOR PEPPER, 575d, Moseley Rd., Birmingham, 12. Tel.: Calthorpe 1618. [3602]

**G**ILBERT INDUSTRIES, Ltd.—Latest offer of parcels and components:—

**C**OMplete Kit for 30 m.a. 150-180-volt A.C. Eliminator, comprising one "B" parcel as under, together with hand-ome cellulose finished steel case, engraved panel, plugs, wire, sleeving, solder, nuts and bolts, flex, plug, etc., and constructor's blue print, all components specially colour-coded to facilitate assembly; a £5.5 eliminator for only 30/-, post paid.

**A** parcels, containing 1 steel chassis with valve holders, 1 heavy mains transformer, 350.0-350v. at 60 m.a., 4v. 6a., c.t., 4v. 2a., 1 Amseco 2-gang with trimmers and 2 coils, 1 8 mfd. condenser, 1 15 mfd. T.C.C. electrolytic, 1 volume control, 1 smoothing choke 50h 50 m.a.; complete parcel, post paid, £1.

**B** parcels, suitable for building Class "B" or straight 50 m.a. 150-180-volt A.C. eliminators, containing 1 Westinghouse rectifier, voltage doubler, 1 choke 50h, 50 m.a., 4 resistances (please state mains voltage); complete parcel, post paid, £1.

**D** parcels, containing 1 steel chassis, with valve holders, 1 heavy mains transformer 350.0-350v. at 60 m.a., 4v. 6a. c.t., 4v. 2a., 1 Amseco 2-gang with trimmers, 1 15 mfd T.C.C. electrolytic, 1 4+4 mfd. H.M.V. block condenser, 1 volume control, 4 assorted resistances, 6 small assorted condensers, 1 Paxolin strip (10in. x 4in.), 1 packet of Varcos sleeving, 6 yards heavy flex; complete parcel, post paid, £1.

(This advertisement continued on next page.)

# WATMEL POTENTIOMETERS GIVE THE BEST CONTROL

It is obvious that if a firm concentrates on one type of component it is going to turn out a better job than a firm that dabbles in many. This year we are concentrating on potentiometers, and you may rest assured that when you purchase a Watmel potentiometer you are obtaining the very best from a firm that specialises in this type of component.

Here is illustrated the Watmel Type 1 Potentiometer.

Any resistance up to 50,000 ohms (Standard Wiring)

Price 5/6

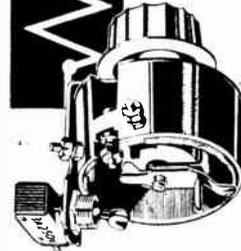
With quick break Switch

Price 7/6

Please write for free fully illustrated catalogue that will give you interesting information on Volume Control.

Special models made for manufacturers and for the Export Market.

Please write for further particulars.



## Watmel POTENTIOMETERS

GIVE THE BEST CONTROL

**WATMEL WIRELESS CO. LTD.,**  
Imperial Works, High Street, Edgware  
Telephone: Edgware 0323 (M.C.91)

You need **ERIES** for certainty

## ERIE IMPREGNATED RESISTORS

Recommended for the NEW WIRELESS WORLD D.C. SUPERHET

Watch the specifications of all the new sets. Erie Resistors are recommended every time. Every set is the better for Eries. They will never break down.



Eries are specially impregnated to prevent humidity effects. Look for the Erie Kits on your dealer's counter—every value you want ready for easy selection.

Write for new descriptive leaflet and Colour Code Chart.

**The Radio Resistor Co., 1, Golden Square, Piccadilly, Circus, London, W.1**

Mention of "The Wireless World," when writing to advertisers, will ensure prompt attention.

# .. and now the BAKER



- 1 Unique plug and socket arrangement giving scientific impedance matching, tone and volume control.
- 2 Special impregnated cone holding "NUCOIL" multi-layer speech coil.
- 3 Large Cobalt Steel Magnet, weighing 5 lbs.
- 4 The sturdy transformer which gives 24 ratios.

to set a new high standard in **REALISTIC** reproduction

Here's the reproducer that's going to set the pace for leadership this season. It's the last word in design, ingenuity, simplicity and performance. No other reproducer can offer you all the features of this new **BAKER** model. It is the "pioneer manufacturers of moving-coil reproducers" crowning achievement. Ask your dealer to demonstrate the "justone" to you to-day—we know you'll agree with us that it's the best yet.

**20 Ratios for Triodes and Pentodes and 4 for Class "B," Q.P.P., and P.P. 200 variations of Tonal Quality! Variable volume control.**

The BAKER "justone" Reproducer represents a distinct advance in speaker technique, far apart from the usual high-class features always associated with BAKER equipment, there are three important additions. The first is the inclusion of selecting devices on the output transformer which makes available 20 DIFFERENT RATIOS FOR TRIODES AND PENTODES, and 4 RATIOS FOR CLASS "B," Q.P.P., and PUSH-PULL combinations. The second is the incorporation of a TONE SELECTING DEVICE which makes it possible to obtain AT LEAST 200 VARIATIONS OF TONAL QUALITY. The third is the fact that a combined adjustment of the above will act as a VARIABLE VOLUME CONTROL. The method of operation in each case is simplicity itself and enables you to make rapid alterations. Optimum output and true tonal quality compensated for room acoustics are thus assured.



the 3 in 1 reproducer

Write for latest Leaflets and Booklets to—  
**BAKER'S "SELHURST" RADIO,**  
75-77 Sussex Road, South Croydon, Surrey.

Telephone: Croydon 3441-2.

The Pioneer Manufacturers of Moving-coil Speakers.

**Components, etc., for Sale.—Contd.**

(This advertisement continued from previous page.)  
**R**.S.3 Mains Transformers, as in "A" parcel, 12/6; heavy pattern P.M. M.C. speakers, 25/-, full volume and tone; B.T.H. Minor pick-ups, latest pattern, 25/-.  
**O**NE "A," "B," or "D" parcels and any one 25/- article for £2, post paid.  
**T**RADERS.—Do you realise that these parcels, when split up, will realise £3 to £4 in the shop?  
**G**ILBERT INDUSTRIES, Ltd., 519, London Rd., West-cliff-on-Sea. We are open to callers Sunday mornings.—Phone: Southend 492071. [3537]  
**M**ILDMAY RADIO EXCHANGE Offers the Following Sound and Perfect:—  
**F**ERRANTI A.F.3, 12/-; A.F.5, 17/-; A.F.6, 17/-; A.F.5c, 19/-; O.P.M.1, 10/-; O.P.1-1-1, 7/6; O.P.M.1c, 14/-; O.P.M.2c, 14/-; O.P.M.3c, 14/-; O.P.3c, 12/-; O.P.4c, 12/-; B5 chokes, 17/6.  
**L**EWIS and Wearite Superhet Coils, 4/6 each; Lewcos T.105, 5/-; A.T.C., 5/-; set Wammel superhet. coils, 12/6, set monodial coils, 17/6; pair K.B.L.C. and I.K.53, 17/6.  
**G**AMBRELL Novotone Senior Standard, 32/6; B.T.H. Senior P.M. speaker, 50/-; Baker's super D.C. speaker, 50/-.  
**C**OLLARO Combined Pick-up and Motor Unit with volume control, fully automatic plate, 59/6; motor only Empire model, 37/6; Garrard A.C.4 motors, fully automatic plate, 35/-; Wates' A.C. motor, 20/-; Undy ditto, 17/6.  
**A**ll Post Paid.  
**O**PEN Thursday. Closed Saturday all day.  
**P**HONE: Clissold 5001.  
**24**, Mildmay Grove, London, N.1. [3599]  
**S**OUTHERN RADIO'S Wireless Bargains.—Set manufacturers' guaranteed surplus.  
**M**AINS Transformers.—250-0-250 volts 60 m.a., 4v. 1a., 4v. 2-4a., 11/-; 250-0-250 volts 60 m.a., 4v. 1a., 4v. 2-3a., 4v. 1a., 12/-; 350-0-350 volts 60 m.a., 4v. 2-2½a., 4v. 2-4a., 13/6; 350-0-350 volts 120 m.a., 4v. 2-2½a., 4v. 3-5a., 4v. 1a., 16/-; 500-0-500 100 m.a., 4v. 2½a., 4v. 3-5a., 4v. 2a., 19/-; step-up or step-down transformers, 0, 100, 110, 200, 230 and 250 volts, 60 watt output 12/6, 100 watt output 14/9.  
**S**MOOTHING Chokes—20 henrys, 120 m.a., 320 ohms, 8/9; 50 henrys, 60 m.a., 500 ohms, 7/8; 40 henrys, 40 m.a., 700 ohms, 5/6.  
**A**ll Mains Transformers and Chokes Guaranteed for 12 Months, specials quoted for and delivery given within 3 days of order.  
**V**ARIABLE Condensers.—British Radiophone 4-gang superhet, type 0.0005, 8/9 (list 45/-); same with dial knob and escutcheon, 12/9 (list 50/-); Polar 3-gang 0.0005, complete with dial, knob, escutcheon, 11/- (list 35/-); Lotus 2-gang 0.0005, complete with dial, knob, escutcheon, 8/6; all ganged condensers are fully screened, with trimmers and boxed; Hydra block condensers, new, 16 mfd., 2+2+8+2+1+1, 1,000 volt test, 7/- each; 4 mfd., 2/6; 2 mfd., 1/9; 1 mfd., 1/-.  
**S**PEAKERS.—Celestion Soundex permanent magnet, 16/- (list 27/6); Iola P6 permanent magnet, 28/- (listed 49/6); I.C. mains energised, 2,500 to 6,500 ohms, complete with humbucking coils and transformers, 16/6 (list 39/6); G. E. C. Stork speakers, complete in magnificent cabinet, 19/6 (listed £3/15); Ormond speakers, complete in cabinets, 10/- (listed 25/-); Utah D.C. mains energised pentode or power, 9in. cone 21/-, 5in. cone 13/6; ultra-permanent magnet speakers, 95 P.M., 35/- each, a really hefty job (listed £4/15).  
**C**ONSTRUCTORS' Kits.—Ready Radio "303" battery 3-valve kits, less valves, 18/- each; complete with 3 Mullard valves (P.M.11.F., P.M.2, 2D.X.), 33/- each (list 70/-); Ready Radio Meteor screen grid 3-valve kit, less valves 26/-, with 3 Mullard valves (P.M.12a., P.M.2D.X., P.M.2a.), 49/- (list £5/7/6); Universal Radio 3-valve kits, ready assembled on chassis, 12/6 (listed 45/-).  
**R**EADY RADIO S.T.400 Kits, as specified by Scott Taggart, £2/19/6 each (list £4/17/6); Mullard Radio for Million 3-valve A.C. kit, complete with 3 Mullard A.C. valves (Pen.4V., 354V., 84V.), £3/10 (list £6/10); Mullard Radio for Million 3-valve battery kits, complete with 3 Mullard valves, £3/3 (list £6/2/6), all kit brand new in original sealed cartons.  
**B**.T.H. Senior Pick-ups, 1934 model with volume control 28/- each (list 37/6); 6 only, B.T.H. Junior pick-ups, 17/5 (list 25/-); British General Band Pass tuning units, 10-K.C. aerial or anode, 5/- each (list 14/6); Lotus triple coil Band Pass units with universal switching, 18/6 per set.  
**R**ECEIVERS. Lotus A.C. mains 3-valve (actual), with Magnavox, M.C. speaker, complete with valves, in magnificent cabinet; £6/19/6 (list £21).  
**A**ll Goods Guaranteed New and Perfect and Sent Carriage Paid.  
**P**LEASE Note.—We have opened branches at 271-275, High St., Willesden Green, N.W.10, and at 46, Lisle St., W.C.2, where callers are cordially invited to inspect our large stocks of wireless bargains. Please send all post orders to 323, Euston Rd., N.W.1.  
**S**OUTHERN RADIO, 323, Euston Rd., London, N.W.1 (near Warren St. Tube). Phone: Museum 6324. [3571]  
**M**OVING Coil Milli-Ammeters, 0-50, 10/6 each; 2 milliamps and 120v., 17/6 each; other ranges in stock; alterations, repairs of every description.—The Vieta Electrical Co., 47, High St., Battersea, S.W.11. [0355]  
**C**HAL-ELECTRIC Offers New Set Manufacturers' Surplus all carriage paid; cash with order, or c.o.d.  
**V**ARIABLE Condensers.—J.B.Nu Gang (3-gang), complete with disc drive, covers, trimmers, escutcheon, light knob, etc., 17/6; 2-gang, fitted as above, 9/6; Polar Star (3-gang 1933), complete, fitted as above, list 30/6, at 18/-; Uniknob 2-gang fitted as above, complete, 10/-; Utility 2-gang, fitted as above, 8/6.  
**C**OILS (6 sets each only).—Colvern Ferrocart, F1, F2, C, £3 ganged, 32/-; Valey Ni-core (1), B.P.30 and 2B.P.31, 28/-; Varley sets, B.P., 19 ganged, 25/6, (3 only) British Radiophone R.F. superhet Radiopak, list 75/-, at £3. (2 only) Colvern Culpak, type II, list 57/6, at £2/8.  
**S**MOOTHING Condensers.—C.E.C. Murphy, etc., 800 test 250 A.C. working, 1 mfd 1/1, 2 mfd 1/9, 4 mfd. 2/6; all the following 1,500 D.C., test 500 A.C., working 800 peak, 1 mfd. 1/9, 2 mfd. 2/4, 4 mfd. 4/-; Multiple Banksall, separate tapings, 20 mfd., 4+4+2+2+2+2+2+1+1 at 11/-, 11 mfd., 4+2+2+2+1, at 6/9.  
**M**AINS Transformers and Chokes.—Philips 250-0-250 at 75 m.a., 4 volts 1 amp., 4 volts 5 amps., 11/-; chokes for same, 30 henrys, 75 m.a. (300 ohms), 6/9.  
 (This advertisement continued on next page.)

## HAYNES DEMONSTRATION NIGHT

Every Friday, 7.30 to 9.30 p.m.

at the Enfield Factory, Queensway, Ponders End, Enfield Town or Enfield Chase Stations, and thence by 'bus or tram.



The free booklet containing—

- The Quality Receiver (optional diode detection)
- Ferrocart Three
- A.C. and D.C. Superheterodynes
- Class B Four
- Class B Three
- Short Waves Receiver and attachment

—all proved designs using those components known to be the best.

## HAYNES POTENTIOMETERS for noise-free volume control



SAFEGUARDS THE CONSTRUCTOR

57, Hatton Garden, London, E.C.1

Chancery 8023

**Best between Aerial and Earth**

**HIGH IN QUALITY**

**HIVAC**

The range of Hivac high quality British made valves at low prices, covers an exact replacement for every type of 2-volt battery valve now in general use.

**FIT HIVAC**  
Maintain Efficiency and Reduce Cost.

The "Wireless World" said:—

"Tests made with... Hivac valves in a recent 'Wireless World' receiver gave results in every respect comparable with those they replaced, selectivity, sensitivity and volume being sensibly the same and the performance of the receiver was entirely satisfactory from every point of view."



**LOW IN PRICE**

PRICES FROM  
**4/6 TO 12/6**

**HIVAC VALVE GUIDE "W"** gives our complete range, and a comparative table of other makes and their Hivac equivalents.

Write Now for a Free Copy.

**HIVAC**  
THE SCIENTIFIC VALVE

**HIGH VACUUM VALVE CO. LTD.,**  
113-117, FARRINGDON ROAD, E.C.1.

THERE ARE **101** REASONS

why YOU should instal the

**PRIMUSTATIC ELECTROSTATIC SPEAKER**

Patent No. 334,643

It is universally recognised and endorsed by the world's leading experts that the finest quality reproduction obtainable is with a Primustatic used in conjunction with a moving coil speaker.

"D" MODEL Size 16" x 14"

specialy designed for use as a Dual Speaker to work with a moving coil. Complete in Chassis Case. **25/-**

STANDARD MODEL Size 20" x 18", supplied in Cabinet only. **40/-**

The Primustatic will clarify your reproduction 100%, and will make listening indescribably more agreeable.

The articles in the three previous issues of "Wireless World" make it easy for anyone to connect up and use the PRIMUSTATIC.

**SEND P.O. OR MONEY ORDER TO PRIMUSTATIC SALES**

(Primus Manufacturing Co.)

Primus House, Willow Street, London, E.C.2

Phone: Bishopsgate 5289.

**Components, etc., for Sale.—Contd.**

(This advertisement continued from previous page.)

RESISTANCES for the "W.W." D.C. superhet "Sera-dix" (1 doz. packets only), complete, 8/- packet.

GRAMOPHONE Motors, B.T.H., Trusped (2 each only), A.C., list 49/6, at 43/-; D.C., list 67/6, at 55/-; Universal, A.C./D.C., list 110/-, at 90/-.

ASK for Special Quotation for Anything You May Need. —Chal-Electric, No. 6, Conduit St., London, W.1. [3525]

M.R.D. Co.'s Guaranteed Surplus, as last week; carriage paid or call; 10% discount on orders over 10/-; also the following:—

DUR-AMSCO 3-gang Condensers, 0.0005, trimmers, drum drive in wavelengths, 7/9; Benjamin v.-holders, 5-pin chassis, or 4-pin sprung type, 1/3 half dozen.

RADIOPHONE Potentiometers, with ganged mains R-switch, 10,000 or 15,000, 2/6; leatherette portable cases, complete, 5/6.

ELIMINATOR 200-250v. Transformers, 150v. output, 3/3; Centralab 40,000 potentiometers, 2/-; see announcement under valves.—The Mains Radio Development Co., 4-6, Muswell Hill Rd., London, N.6. [3538]

SURPLUS Components of All Descriptions for Disposal; bargain prices; callers only.—Newport Surplus Store, 24a, Newport Court, W.C.2. [3611]

SPECIAL Clearance Bargains.—Projectors (9, 16 and 35 mm.), 30/-; Cameras, from 20/-; everything for Movies, Walkies and Talkies; inspection invited.

ILLUSTRATED ENTERPRISES, 159, Wardour St. (facing I. Film House), London, W.1. Phone: Gerrard 6889. [3604]

THE New "Jus-Tone" is fitted with variable matching device, variable tone control and variable volume control, and requires no other components.—Baker, Selhurst Radio. [3639]

EPTON Leads Again!—First read my advertisements under "Cabinets" and "Valves" Sections; then end for Epton's Radio Bargain Bulletin, 93, New Rd., Chingford, E.A. Phone: Silverthorn 1427. [3631]

RESISTANCE Boxes, 8,000 ohms, 2 rotary switches, set of plugs, 35/-; Swiss commutator circuit selector with plugs, 4/6, postage 9d, each; clockwork fitted electric control, 5/6; postage 6d.—Beaton, Chalk Farm Rd., N.W. [3605]

MODERN RADIO.—The original bankrupt stock and set manufacturers' surplus Buyers, offer the following enormous bargains in Philips, I.M.V., Marconi, and other well known makers' goods; all goods advertised are post free, except I.F.S., and are in perfect order.

MARCONI Ideal Transformers, in perfect order, 5/- each, 2.7-1, 4-1, or 6-1.

PHILIPS Special Nickel Iron Core Chokes, with special alloy wire and highly impregnated winding, 30 henry, 400 ohms, 2/6; Philips smoothing choke, 1,000 ohm 40 m.a., 20 hen., 2/-; Philips block condensers, 300 volt working, 4x5x1.5x0.5x0.5x0.2, 3/9.

DUBILIER 650 volt Test Condenser, 8x4x2x2x2x2.25, 6/-; 500 volt test, 2x2x1x1x1x1, 4/-.

TRANSFORMERS for J.T. 8 Rectifiers and 4 volts 4 amps, C.T., 4 volts 1 amp, C.T.; 9/6.

PHILIPS Mains Transformers, for 100-240 volts input, output, 250-0-250 60 m.a., 4 volts 4 amps, C.T., 4 volts 1 amp, 5/-.

UPLIFT 3-gang, 0.0005, fully screened with trimmers, disc drive escutcheon and brown dials; 11/6, new and boxed.

PHILIPS Mains Transformers, 210 volt input, output 200-0-200 30 m.a., 4 volts 3 amps, C.T., 4 volts 1 amp, with screened primary, 4/6; output 200-0-200 30 m.a., 4 volts 3 amps, 4 volts 1 amp, 3/6; assorted 100 volt transformers, stampings alone worth more, 1/6 each, 15/- per dozen.

A.C. Ammeter, new and boxed, reading 0-15 amps., 3/6 each; A.C. voltmeter, dual range 0-5.5 volts and 275 volts, made by well known manufacturer, new and boxed, 12/6; smoothing choke, 750 ohm., 40 m.a. 20 hen., 3/-; 10 amp. Tumbler switches, 6d. each, new and unused.

THE Original N. & K. Farrand Inductor Speaker Absolutely New, unused and boxed, tone surpasses many moving coil speakers at present on the market; originally listed at £5/10, our price 25/-; don't miss a bargain like this, we have only a limited number.

COLLARO Gramophone Motors, new and boxed, 100-260 volt A.C. type, bronze finish on uniplate with 12in. turntable and auto-stop; 37/6.

ERIE 1 watt Resistors, 4,000; 10,000, 350, 15,000, 20,000, 30,000, 250,000 ohms.; 8d. each.

ALL Post Orders and Callers to Modern Radio, 25, York Terrace, Clapham, S.W.4. Nearest Tube Station Clapham North. Callers only to Modern Radio, 37, Lisle St., W.C.1. Nearest Tube Leicester Square. [3624]

FERRANTI A.F.4, 7/9; A.F.3, 10/6; A.F.5, A.F.6, 18/6; O.P.M.2c, O.P.M.2, O.P.M.5c, O.P.M.1, 14/-; B.I. choke, 11/6; Colvern K.21, K.22, K.23, 13/6; Lewos or Wearite superhet, coils, 4/6 each.—Bostock and Stonnill, 1, Westbourne Terrace, S.E.23. [3614]

COLVERN Ganged K.61, K.62, K.G.R., 15/-; ganged pair K.5, 10/-; K.53 oscillator, 5/-; Ferranti A.F.5(c), 17/6; A.F.5, 15/-; A.F.6, 15/-; Westinghouse A.3 and transformer, 15/-; Heayberd 350x350, etc., 15/6; Magnavox D.C.144, 2,500 field, 16/-; all perfect.—Hulbert, 24, Pargeter Rd., Warley, Birmingham. [3615]

H.D. RADIO ELECTRICAL SERVICE Offers Surplus of a set Manufacturers' every article guaranteed new: Moving coil speakers, Magnavox, type D.C.144, 2,500 or 7,500 ohms resistance, with multi ratio transformer, at 18/-; type D.C.142, same voltages, at 25/-; automatic record changers, Garrard, 1933, complete with pick-up, A.C., list £10, at £7/15; gramophone motors, Collaro, complete with pick-up and volume control, list 80/-, at 3 guineas; all goods carriage paid; cash with order or c.o.d.; callers only, between 1 and 6 p.m.—No. 9, Kingley St., Regent St., London, W.1. [3601]

CLASS "B" COMPONENTS.

SECOND SALES, Ltd., for Class "B" Components, List S.O.B.B. on request.—Tremlett Grove, Highgate, N.19. (0401)

**MISCELLANEOUS.**

EASY Payments.—We supply, by easy payments, components, accessories, and sets, any make; 10% down, balance spread over 11 months.—Send list of requirements to London Radio Supply Co., 11, Out Lane, London, E.C.2. [3537]

AMBITIOUS Men.—Qualify for a well-paid post by studying at home with the T.I.G.B. Write to-day for "The Engineer's Guide to Success," 144 pages, free, which contains the widest selection of engineering and wireless courses in the world, and shows you how to become A.M.I.E.E., A.M.I.Mech.E., A.Rad.A., etc. State branch, post, or qualification that interests you.—The Technological Institute of Great Britain, 82, Temple Bar House, London, E.C.4. (Founded 1917. 19,000 successses.) [3585]

**YOU ARE MISSING all the SHORT-WAVE PROGRAMMES**

Unless you fit an 'EELIX' Short Wave Converter to your present set. You can receive America, Russia, Australia, South Africa, etc.

Here are just six reasons why the 'EELIX' Converter is superior to an Adapter.

1. Your own set, if fitted with a screen grid valve, can be used with an 'EELIX' Converter.
2. You can tune down to as low as 14 metres and up to 60 metres, and bring in 70 extra stations.
3. You add another stage to your set, in fact, convert it into a short-wave super-het.
4. You utilise every valve in your set plus the one in the Converter, thus power and volume are greatly increased (an Adaptor only uses the L.F. stage).
5. The most inexperienced can receive Short-Wave Stations with this Instrument—no technical knowledge necessary.
6. You can still use your set for ordinary broadcast reception

**52/6**

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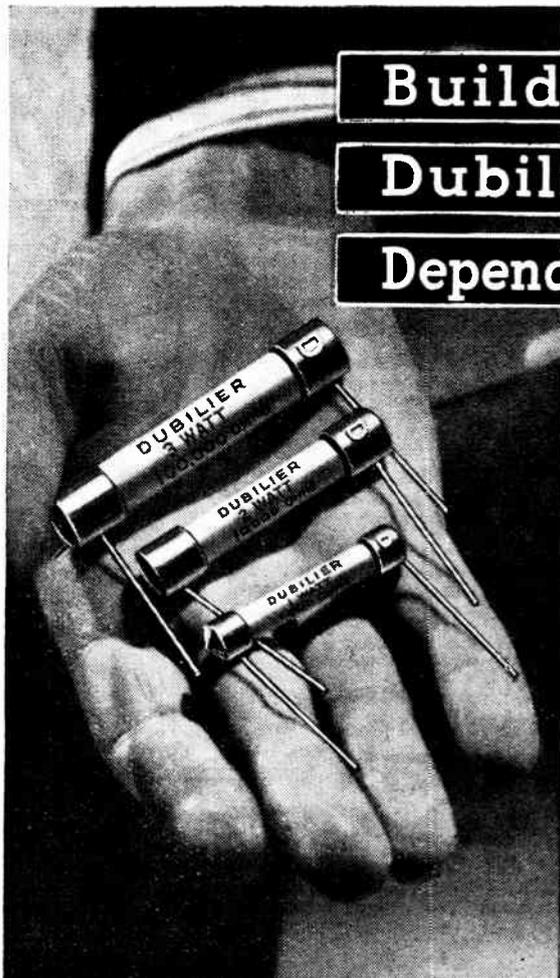
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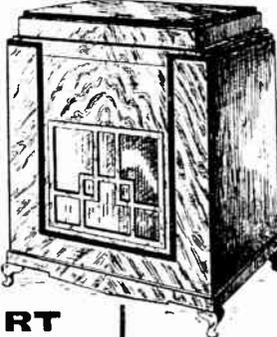
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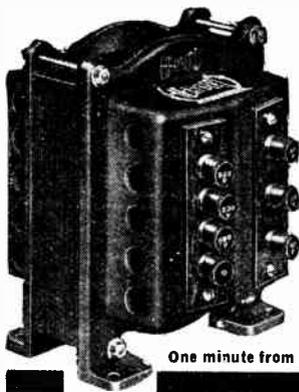
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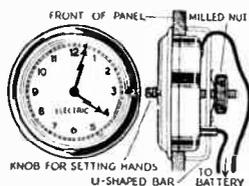
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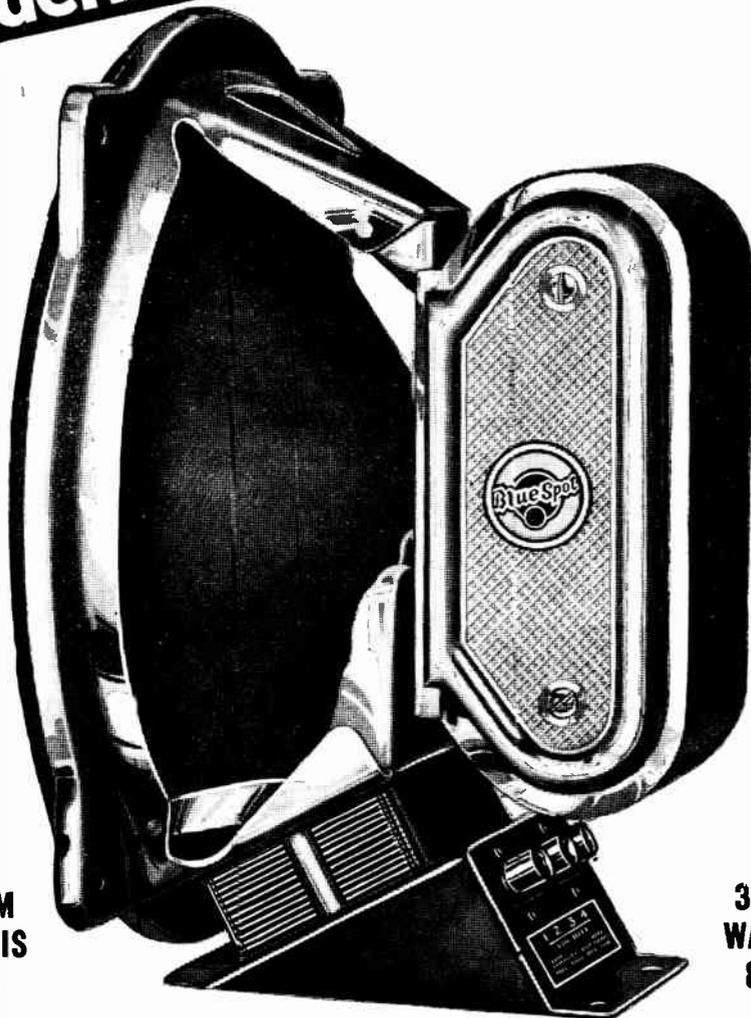
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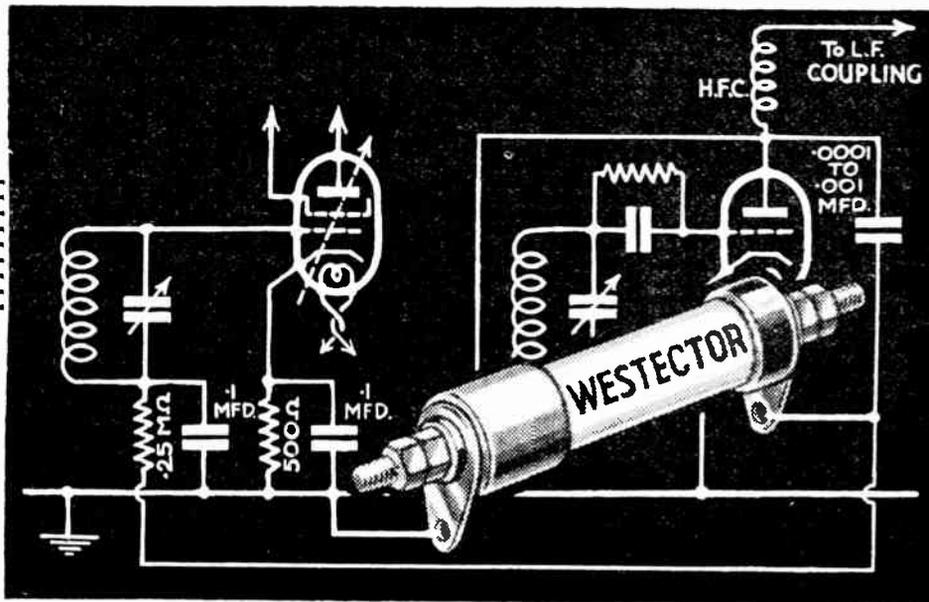
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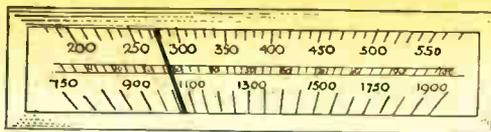
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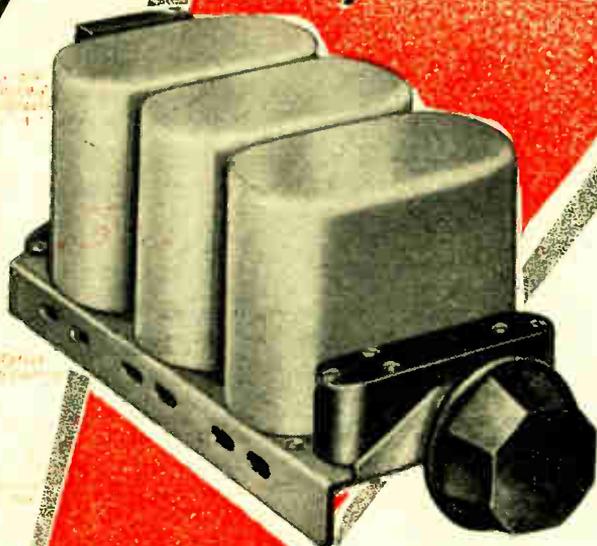
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# HINTS AND TIPS

Wireless listeners who regard their sets as "mystery boxes" can never hope for as good reception—or as low maintenance costs—as can those who take an intelligent, even if superficial, interest in the technicalities of the subject. The information given in this booklet is intended for the user of factory-built sets as well as for the home constructor, and is arranged under the following headings: *Tracing, Clearing and Preventing Faults* (pp. 3-8). *Hum and Electrical Interference* (pp. 8-10). *Adjusting and Trimming* (pp. 11-14). *Measurements and Calculations* (pp. 14-16). *Tone and Volume Control* (pp. 16-18). *Pick-ups and Gramophonics* (pp. 18-20). *The Loud Speaker and Output Stage* (pp. 20-24). *Miscellaneous* (pp. 24-30).

## Tracing, Clearing and Preventing Faults

ONE cannot go very far in matters pertaining to wireless reception without encountering the need for some means of ascertaining definitely whether continuity—or a through metal circuit—exists between two points in a receiver, or between the terminals of some component or accessory. For years past a pair of head telephones and a dry battery have been widely used as a crude but effective form of aural indicator to show continuity—or the lack of it.

But now the headphone has almost disappeared, and as the loud speaker is but a poor substitute for testing purposes we must look for something else from which a continuity indicator can be improvised.

As a relic of the days when their sets were operated from batteries, many readers who have now changed over to "all mains" operation will have a spare low-tension voltmeter, probably reading from 0 to 6 volts, and of the moving-coil type. With the addition of a battery and a

of ohms. A 4.5-volt flash-lamp battery is generally suitable for testing, and is, of course, wired in series with the meter and the external circuit.

By arranging three terminals as shown in the accompanying illustration and diagram, the meter may be used either for its normal function of measuring voltage or as a continuity indicator, depending on the terminals to which the external leads are connected.

In a testing unit of this sort we have also a crude form of ohm-meter, but only one that will be reasonably accurate over a limited range of resistance values. The procedure for translating voltage readings on the scale to ohms is first to measure the voltage of the test battery directly, and then to read the voltage indicated with the unknown resistance interposed in circuit. Then subtract "voltage indicated" from "measured battery voltage," and multiply the remainder by the internal resistance of the meter. Finally, the product of the last calculation, divided by "volts indicated," will give the value of the resistance in ohms.

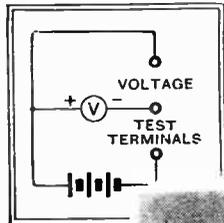
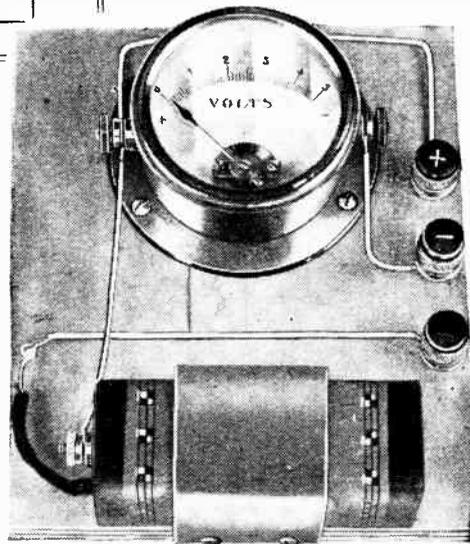


Fig. 1.—A dual-purpose instrument: arranging a voltmeter to give indications of continuity and voltage.



few terminals this meter may be converted into a useful testing device, ready for use at any time, and capable of showing continuity through resistances of many thousands

## Tracing H.F. Instability

It is generally advised that, when attempting to trace the causes of uncontrollable self-oscillation in an H.F. amplifier, matters should be so arranged that the set is only just oscillating. In this condition it will be particularly responsive to any experimental alterations that may be made, and the beneficial effect of any improvement to the screening system, addition of extra decoupling, etc., will be readily perceptible, as a slight reduction in undesirable inter-stage feedback (which is always responsible for these troubles) will at once stop self-oscillation.

## Testing by Short-circuiting

Of all the faults to which a wireless receiver is liable, the most annoying are those of an intermittent nature. Like the traditional aching tooth, they are apt to cure themselves suddenly at the very moment when it is decided to make a determined effort to remove the source of trouble. Clearly, patience is needed, and, unless one happens to be particularly lucky, the location of the fault is likely to take some time.

It will be assumed that the aerial has been temporarily disconnected, and, from the fact that intermittent cracklings still occur, it has been rightly deduced that they are due to the receiver itself, and not to interference from external sources. Instead of disconnecting components and testing them separately, it is generally quicker to localise the trouble by applying a series of short-circuits to the receiver, working in a logical sequence and rather in

the manner usually adopted when tracing hum in a mains-driven set.

If it be decided to follow this plan, the method of procedure illustrated diagrammatically in Fig. 2 will usually be found best. Although a simple battery-operated H.F.-det.-L.F. set is taken as an example, the scheme is clearly applicable to any type of receiver.

Almost invariably it will be best to make a start at the output end of the receiver and to work backwards, "shorting" each grid circuit in the sequence shown in the diagram. If the noises cease as a result of a "short," it may be assumed that all succeeding circuits are in order. As soon as a point is reached where the "short" has no effect, it may be deduced that the fault lies between that point and the last at which silence was obtained.

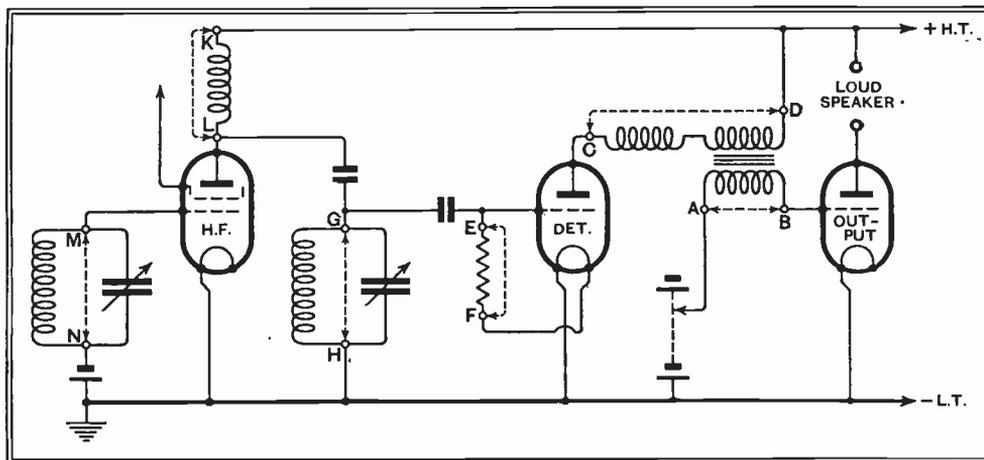


Fig. 2.—Where temporary short-circuits may be applied when tracing faults by a process of elimination.

Referring to the diagram, if noises persist after bridging the L.F. transformer secondary terminals (points A and B), it will be proved definitely that the fault is due either to the output valve, the loud speaker, the source of H.T. supply, or, just possibly, to the G.B. battery.

But, on the other hand, if complete silence be obtained, we know that all these components are free from blame and that the fault lies nearer to the input or "aerial" end, and that investigations must be carried a stage farther. This is done by "shorting" the detector grid leak (E, F); a recurrence of noise will indicate a faulty detector valve, H.F. choke, or L.F. transformer, while silence shows once more that the defect is still nearer to the aerial and that the short-circuit must be transferred to points M, N. Deductions will still be made in a similar manner.

In addition to the testing points mentioned, others are shown in the diagram; these may be regarded more or less as alternatives, to be used when they are more accessible, or even to narrow down the field of search. Points C, D are virtually almost equivalent to A, B, while both K, L and G, H are in parallel with E, F. It is worth while pointing out that defects—particularly in H.F. circuits—are often more readily perceptible when the set is tuned to a fairly strong carrier wave while tests are being made.

It will be fairly obvious that this method of testing offers the great advantage that none of the internal wiring of the receiver need be disturbed. If, at the worst, results are not entirely conclusive, the fault will have been localised in a single circuit, or, at any rate, in a small section of the receiver.

As an aid to making tests of this nature, a length of flexible insulated wire with a crocodile clip at each end

is most useful, as it enables the appropriate points to be bridged with a minimum of trouble and without the need for unscrewing inaccessible terminals, etc.

## Testing by Touch

Almost every user of a wireless set will have observed that various effects become evident if certain parts of the receiver be touched with the finger while it is in operation. It is sometimes held that rough-and-ready tests may be carried out in this manner, but it is by no means easy to draw a logical conclusion from the effects that may be observed. One result of touching the point in the receiver is to connect a resistance of high but rather uncertain

value between that point and earth. Another effect which in nearly every case is much more important, is to add a capacity of similarly undefined value between the same point and earth. Further, body capacity may act as an unwanted coupling between circuits, and so may produce instability.

By touching the high-potential end of the grid circuit, it is generally re-assuring to find that signal strength is decreased, thus indicating that the tuning of the circuit has been disturbed. It is possible that on touching the high-potential end of one of the tuned circuits of a ganged

receiver, signals may become stronger. This effect conveys the warning that in all probability the circuit is out of alignment with the other, and has been artificially brought into tune by the addition of body capacity.

A complicating factor, which shows the dangers of forming too hasty conclusions, is due to the "aerial" effect of the body. To avoid excessively loud signals, tests are often made with no aerial, or with a very short aerial, and in such cases the signal "pick up" of the body may overshadow the effect of its capacity in detuning the circuit.

## Checking Ganged Condensers

Multiple-unit ganged condensers may fairly be called instruments of precision nowadays; if they were not, the good results so widely attained with sets having single-knob tuning would be quite out of the question. But, although the rigidity of these components has been greatly improved of late, a warning as to the need for taking reasonable care in handling them will not be out of place. Indeed, one can justly say that no part of a set—not excepting the valves—should be handled with more respect. The matching of individual units of even the best of condensers is likely to be impaired if they are dropped on the floor, and much less harsh treatment may well have a prejudicial effect on the accuracy of the average specimen.

Apart from the question of accidents, there is a possibility that the whole frame may be distorted when the condenser is mounted in position if unequal pressure be exerted by the holding-down screws. Consequently, great

care should be taken to see that the condenser is mounted on a flat surface, or else strains may be avoided by the use of packing washers of suitable thickness. An alternative, and perhaps better, plan is to avoid rigid mounting altogether by interposing bushes of resilient material; this practice is exemplified in some of the latest superheterodynes, although flexible mounting is here adopted mainly for another reason. An unmatched condenser will seldom give any visible indication that anything is wrong, and in order to determine whether poor results are really due to defects in this component—and not to the coils—it is usually quickest in the long run to remove the condenser from the set and to apply an electrical test. Unfortunately, a certain amount of apparatus will be needed, but this is of the type which is usually available, or, at any rate, which can be improvised with existing components. The absorption method, which has so many applications, and which, incidentally, is a veritable godsend to the amateur, again comes to our help, and it is suggested that the method of testing illustrated diagrammatically in Fig. 3 will generally prove to be the simplest.

Referring to this circuit diagram, the valve oscillator that is necessary for testing may consist of the circuits of any reacting detector valve, with a milliammeter added in series with the anode. In place of the normal tuning condenser, the ganged condenser under suspicion is shunted across the tuning coil, arrangements being made by means of a plug-and-socket connection or a spring clip to join any section of this condenser in circuit. Initial adjustments are made by setting the moving vanes to minimum capacity, and then adjusting individual trimmers so that the grid circuit resonates to precisely the same wavelength when tuned by any one unit. Resonance is most easily determined by the use of an absorption circuit (as shown),

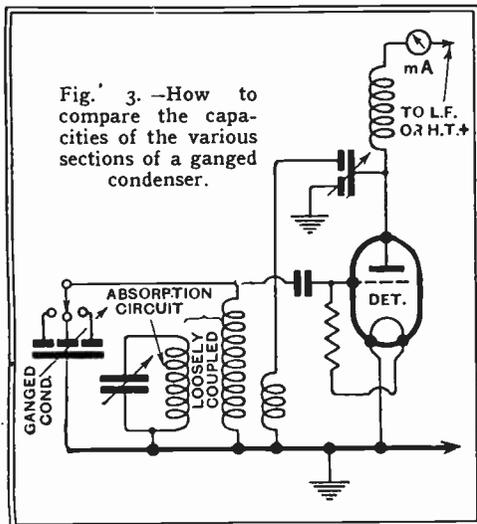


Fig. 3. -How to compare the capacities of the various sections of a ganged condenser.

of which the coupling to the grid coil should be just close enough to give a slight deflection of the milliammeter needle as the indicating circuit is tuned through resonance.

Having set the trimming condensers, check readings should be taken at as many settings as possible of the ganged condenser; at each point, the reading of the absorption circuit condenser corresponding to resonance should be exactly the same, whichever unit of the ganged condenser may be in circuit.

If considerable discrepancies should be found, there is usually no course open to the amateur but to arrange with the manufacturers to realign the condenser; this is distinctly a job for specialists.

## Parasitic Oscillation

Parasitic oscillation is most common in an output stage, where it manifests itself as an almost complete cessation of signals, combined with a very heavy increase in anode current. The oscillations are probably taking place at a frequency determined by the inductance of the wires running to grid and plate, with interelectrode and other stray capacities acting as tuning condenser.

In the case of an output valve, which is not in any event expected to deal with high-frequency currents, the cure is based on the well-known "grid-stopper." A non-inductive resistance of about 5,000 ohms is connected, right up against the valve-holder to the grid of the valve, in series with the signal-path (Fig. 4). The combination

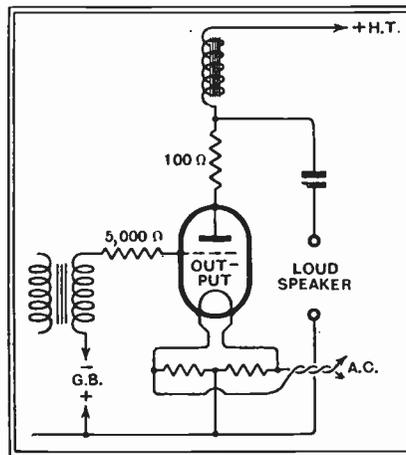


Fig. 4. -Anti-parasitic resistances in a typical output stage.

of this resistance with the grid-filament capacity of the valve makes a fairly effective filter preventing high-frequency voltages from developing on the grid. Additional safety may be had by connecting a similar type of resistance, of only about 100 ohms, directly up against the anode terminal to act as an anode-circuit filter.

When oscillation of this type occurs in a detector stage, the cure is different. This valve has to deal with high-frequency signals, so that a resistance filter, while effective in checking the oscillation, might lead to a considerable drop in signal strength. A choke, consisting of ten or fifteen turns of wire wound to shape round a pencil, and then slipped off its temporary "former," may be connected between grid and grid-condenser. Its impedance to signals of normal wavelength is far too low to matter, but it is generally perfectly effective in checking the parasitic oscillation.

A choke of this kind may also be used in the output stage if no suitable resistance is to hand, but it will usually be found that the resistance provides a more certain cure, and so should be used whenever the conditions of the circuit make it possible to do so.

## Superheterodyne Tests

In dealing with a superheterodyne, there is a real risk of confusing instability (uncontrollable self-oscillation of H.F. or I.F. valves) with severe second-channel and similar forms of interference. The symptoms are similar, and it is none too easy to distinguish between them. Incidentally, it may be remarked that true instability is not a common fault in a superheterodyne; this is one of the

advantages of the superheterodyne system of reception. If it happens that instability is really the cause of the trouble, this fact can be confirmed fairly easily by manipulation of the volume control. As intensity is gradually reduced, whistling will stop suddenly, and will not occur again when other stations—at any rate, those operated at a higher wavelength—are tuned in.

### Testing H.F. Chokes

Although H.F. chokes are generally trouble-free components, they are sometimes responsible for an inexplicable falling-off in sensitivity at certain wavelengths or over certain narrow bands of frequencies. Effects of this nature may be due to what are known as "flat spots" in the choke, which may offer an opposition to currents of these frequencies that is very much below the average value.

It is useful to know that by the simple expedient of connecting the choke across any one of the tuned oscillatory circuits of a receiver we have a method of testing its efficiency that is adequate for most purposes, if not entirely beyond criticism

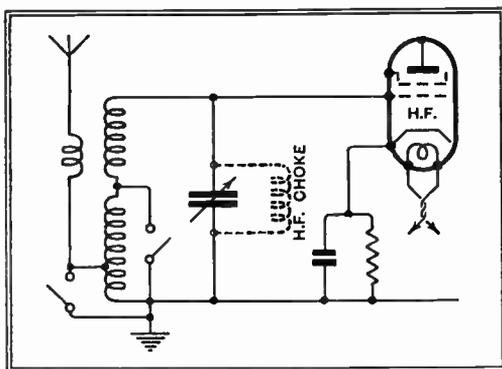


Fig. 5.—An H.F. choke shunted across a tuned circuit.

The connection of a choke in this manner (see Fig. 5) is bound to introduce some loss in signal strength, although with modern circuits the falling-off due to a good choke is likely to be so small that it will not be aurally detectable. There will, however, be some alteration in tuning, due to the addition of the choke self-capacity, and when making a comparison the circuit must always be retuned.

To be effective, the test must be made at a great number of different wavelengths; it is, of course, carried out by observing the difference in signal strength with and without the parallel-connected choke.

This method of testing is particularly applicable to chokes used in parallel-fed H.F. amplifiers. When it is suspected that poor reception of a certain station, of a band of frequencies is due to the choke, the lengthy procedure of testing at all frequencies within the broadcast band may be avoided by concentrating on the particular frequencies where the receiver seems to be insensitive.

The test suggested is obviously applicable when comparing the merits of different chokes. Its utility, accuracy, and general convenience are greatly enhanced by the use of some method of making relative measurements, such as a detector anode current meter. Further, a local oscillator is clearly desirable as a source of steady signals.

### Signs of Detector Overloading

Many sets, unknown to their owners, are operating with a detector valve in an almost chronically overloaded condition. In other words, the detector is being worked in

such a way that the maximum undistorted output obtainable from it is insufficient to load the output valve. Distortion introduced in this way is insidious, for the reason that it is of a type to which the ear soon becomes atrophied. The trouble is one to which receivers without an intermediate L.F. stage are particularly susceptible, and it is rather more likely to occur with a triode output valve than with a pentode.

The presence of detector overloading may be suspected when the set fails to respond readily to its sensitivity control—reaction, S.G. valve bias, etc.—after a certain point is reached. Signals that are initially very weak become stronger, but others, just below the intensity required for full output, do not respond to the control in the proper manner.

Apparent sharpness of tuning is also a good guide. If weak signals tune sharply, but strong ones, corresponding to approximately full volume, can be heard at the same strength over a much wider angular displacement of the tuning dial, it is reasonable to suspect that the detector is at fault.

Failing emission in a valve may be responsible for this trouble; if it is not an increase in detector H.T. voltage should be tried as a cure. If the maximum available H.T. voltage is already applied it may be possible to improve matters by reducing the value of the decoupling resistance; one often tends to be over-generous in these matters.

### Increasing Decoupling

In ninety-nine cases out of a hundred nothing but good can result from increasing the capacity of by-pass condensers in L.F. decoupling circuits. In most modern sets, when motor-boating or some other form of instability occurs, or even when quality is deficient, the first thing to do is to try the addition of extra capacity in parallel with the existing detector-anode decoupling condenser.

Even when dealing with a well-tried standard receiver of known excellence, it may be worth while to try this expedient if quality seems to be a little "rough." No designer advocates a by-pass condenser very much larger than that considered necessary for dealing with the amount of magnification obtainable under average conditions, but sometimes the average is exceeded by a very fair margin. For example, the detector valve may be a particularly "hot" specimen; rectifier output may be high, and the associated decoupling resistance may be under rather than over its rated value. All these factors work in the same direction, tending to reduce the margin of safety, and this is a case where extra decoupling might well be beneficial.

One cannot usually increase the value of a decoupling resistance without risk of upsetting the designer's original intentions, but the use of a larger condenser should have the same beneficial effect, and, at the worst, can do no harm.

### Leaky Coupling Condensers

It is as well to cultivate the habit of making periodical tests of the insulation resistance of coupling condensers used in a resistance-capacity amplifier. Quite a small leakage will seriously impair the working of the valves: when high-resistance grid leaks are employed so much positive voltage from the source of H.T. supply may reach the grids that the negative bias voltage normally applied may be entirely cancelled out.

Although a direct measurement of the insulation resistance of the coupling condenser can seldom be made with the apparatus available, it may be remembered that we have a fairly certain indication that the condenser is leak-

ing when the anode current of the associated valve is found to be unduly high.

More or less serious distortion will suggest that one or more of the condensers may be leaking. The symptoms are those of overloading, but if the grid condenser of the valve preceding the output stage is not at fault, the working of the output valve would not be affected. For instance, a meter connected in its anode circuit would show a steady reading.

## Reaction Coil Connections

Before components reached their present state of standardisation the ordinary practice of the home constructor was to arrive at the correct connections of a reaction coil by trial and error. The connections were made at random, and if the valve oscillated when reaction was applied all was well. If it did not, then the connections to the coil, or even the coil itself, were reversed.

The matter is not quite so straightforward nowadays. A modern high-efficiency valve may sometimes be made to give unmistakable signs of self-oscillation, even though the sense of the reaction winding be incorrect. The effect of increasing reaction coupling will, however, not be that desired, as signal strength will not be improved.

From this emerges the fact that where the reaction-control system fails to work satisfactorily an experimental reversal of connections to the coil is still worth trying.

## Short-wave Interference

When working on short—and particularly on ultra-short—wavelengths, it is often found that noises which are akin to those caused by atmospherics, electrical interference, or by a loose internal connection, may be produced in a way that is seldom suspected by the average user. Severe interference can be set up by loose metal objects in contact, such as tools, etc., in the immediate vicinity of the receiver.

This trouble, in a particularly aggravated form, was recently traced to the fact that a drawer under the table on which a newly built set was being tested was used for storing tools and various pieces of metal; on removing the drawer to a distance the interference ceased entirely.

## Temporary Bias Circuit Repair

When a self-bias resistor breaks down, or when a resistor of the right value for this purpose is not available, it may be remembered that a bias battery of the right voltage may be used to replace it. This applies to true self-biased circuits, in which negative grid voltage is developed across a resistor inserted in the cathode lead of the valve concerned. In order that polarity may be correct, the usual procedure in connecting the bias cells in battery-operated sets must be reversed, and, instead of joining the positive pole to the H.T. negative-earth line, it must be joined to the cathode terminal of the valve-holder. The negative side of the bias battery is joined to earth, and then, assuming that the grid return lead is also joined to earth in the usual manner, the grid of the valve will receive negative bias.

## Avoiding Short-circuits

Where an insulated wire is passed through a metal baseplate or screen especial care should be taken to preclude the possibility of a short-circuit. In some cases it is as

well to supplement the normal insulation by a tubular sleeve, or, better still, by a rubber bush if the wire is likely to be subjected to strains.

Insulation is particularly likely to fail if a wire is bent sharply at the point where it emerges from the hole (see Fig. 6, A). When metal-covered plywood is used as a base-

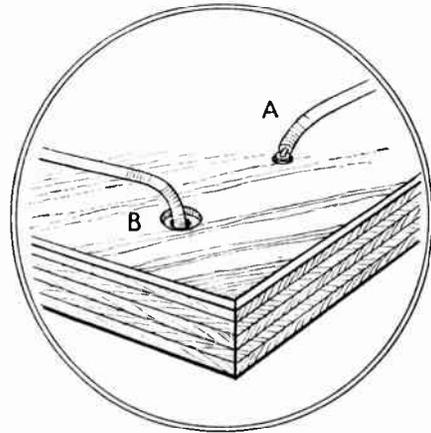


Fig. 6.—Risk of short-circuited leads is reduced by counterboring the metal baseplate.

board, the possibility of this trouble is greatly reduced by drilling a small hole for the wire and then, with a larger drill, cutting away the metal surrounding the hole, as in Fig. 6, B.

## Mechanical Reaction

Most constructors of highly sensitive sets, and particularly of superheterodynes, have encountered a form of L.F. howling which is due to acoustic reaction between the loud speaker and the vanes of a section (generally the oscillator section) of the tuning condenser. It is not generally recognised that this form of undesirable reaction may produce a bass resonance without being strong enough to cause audible howling. Distortion introduced in this way is particularly disturbing, and is none too easy to trace.

The usual remedy is to insulate mechanically the whole tuning condenser assembly, including the drive mechanism from both the chassis and the control panel. Most modern condensers are constructed in such a way that it requires little ingenuity to devise an insulating system which will be quite effective; usually an arrangement of rubber bushes or rubber packing pieces can be employed successfully.

Finally, it may be pointed out that the addition of a short-wave converter to a superheterodyne receiver seems to provoke this trouble. The probable cause is additional acoustic feedback to the condenser of the short-wave unit, which accordingly should be shielded or mechanically insulated if the trouble is suspected.

## Noisy Volume Controls

In a modern receiver where volume is controlled by means of a potentiometer producing variation of an applied voltage, either of grid bias in the case of variable- $\mu$  S.G. valves, or of screen voltage in ordinary S.G. valves, it is often found that movement of the volume control set up crackling noises in the loud speaker owing to imperfections of contact between the sliding arm and the resistance wire.

Especially is this noticeable as the control is moved towards maximum volume in sets with more than one H.F. valve or in superheterodyne receivers. It is usually im-

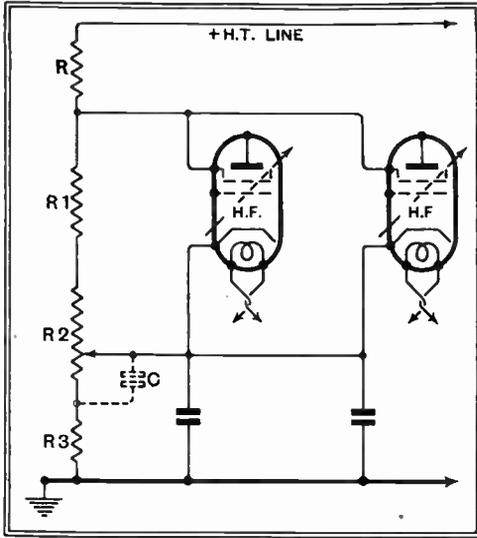


Fig. 7.—Addition of the condenser C will generally reduce volume-control noises.

practicable to improve matters by increasing the pressure of the contact arm.

Such a condition was found to exist in a fairly straightforward "superhet," and although different makes of potentiometer were tried the trouble was not entirely overcome.

Eventually it was found that the connection of a 2-mfd. condenser between the contact arm and the "sensitive" end of the resistance winding completely removed the crackling. As the maximum working voltage is low, practically any condenser of 2 mfd. would be suitable. Connections in the case of a standard type of set are shown in Fig. 7.

### Test for "Softness"

It is not always realised that the decoupling resistance used in conjunction with an automatic bias scheme offers a ready means of testing the valve in whose grid circuit it is connected for "softness," or deficient vacuum. If anode current is changed to any appreciable extent as a result of short-circuiting this resistance, it can almost invariably be assumed that the valve is soft; the extent of change in current is more or less a measure of the degree of softness, although the magnification factor of the valve concerned must always be taken into account. Current variations are always greatest when dealing with high-magnification valves.

## Hum and Electrical Interference

*Deflecting interfering H.F. impulses in the mains supply leads.—Tracing the source of hum.—Interaction between components and circuits.—Interference radiated from electrical wiring*

### Extra Smoothing

THE amount of smoothing provided by a loud speaker field winding is enough for all practical purposes in many sets, especially as the anode current supplied to the earlier valves in the receiver usually receives additional smoothing by the decoupling resistances and condensers.

For the benefit of those who are hypercritical with regard to background noises, and who therefore wish to fit extra smoothing, it may be pointed out that the additional choke and condenser which will be used for this purpose should always be inserted on the rectifier side of the existing smoothing equipment, as shown in Fig. 8. It is especially important that this position should be chosen in cases where the loud speaker is not fitted with a hum-neutralising coil. Indeed, these remarks apply particularly to these cases, as otherwise more scientific methods of reducing hum may be used than that now being advocated, which must admittedly be classed among the "brute force" systems.

For the extra smoothing choke needed for the purpose in question, an inductance of some ten henrys is enough. D.C. resistance is of importance, and the addition of more

than 200 ohms or so is always to be avoided. If care be taken the loss of voltage in the choke, under average conditions, need not exceed 10 or 20 volts.

### Filtering Out Interference

Even though the usual precautions have been taken, it is not uncommon to find that a certain amount of H.F. energy reaches a mains-operated receiver from the power supply circuits, and is responsible for an excessively noisy background. This is particularly likely to be troublesome when the set is fed from D.C.; it is to users of this type of supply that these remarks are mainly addressed.

Experimental work that has been recently conducted proves conclusively that certain forms of interference may be eliminated completely by means of the simple and

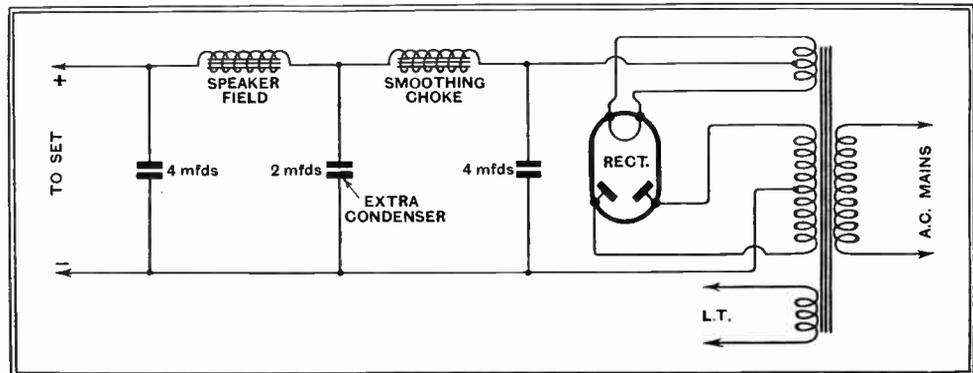


Fig. 8.—Correct position for additional smoothing apparatus.

inexpensive filter shown diagrammatically in Fig. 9. The point about this filter is that it includes a single choking coil, by means of which the disturbing impulses are pre-

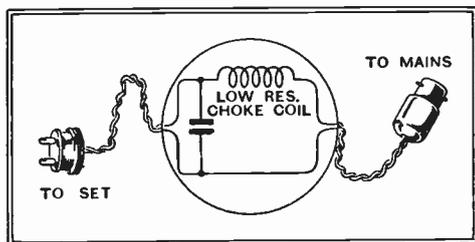


Fig. 9.—A simple mains filter.

vented from gaining access to the receiver circuits. A device of this sort is quite valueless unless the choke be connected in the right lead, and this is a matter that can be determined only by trial and error. Fortunately it only takes a moment or two to change over the choke to the other lead if, in its original position, it fails to reduce the interference.

In many cases a coil of about 100 turns of No. 22 wire on a former of roughly 2in. or 2½in. in diameter will meet the case. In the absence of anything better, an obsolete tuning coil may be tried, but it should be remembered that the D.C. resistance should not amount to many ohms,

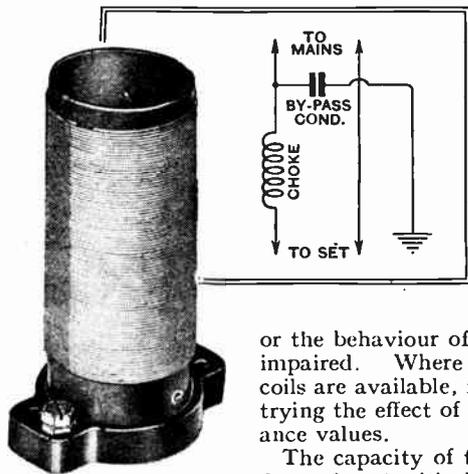


Fig. 10.—Alternative arrangement of a mains filter, and (inset) a typical low-resistance choke.

or the behaviour of the set may be impaired. Where a number of coils are available, it is worth while trying the effect of different inductance values.

The capacity of the by-pass condenser is not critical; anything from 0.1 mfd. upwards may be expected to prove satisfactory, and as low a value as 0.002 mfd. will sometimes be effective.

Although there is always an element of uncertainty with regard to the cure of interference in D.C. mains receivers, the device described is so simple and inexpensive that it is always worth a trial even if the interference is but slight. As often as not it will work, as the patent medicine advertisements used to say, "like a charm."

It will occasionally be found that instead of connecting the by-pass condenser directly across the mains, as shown in Fig. 9, it is distinctly better to earth one side of it, as indicated in Fig. 10. Generally speaking, it will be sufficient to make the connection to the normal receiver "earth," but occasionally the use of a separate local earth is beneficial.

The benefits of this alternative system of connection are especially likely to be felt when the receiver earth is none too efficient; the great advantage is that interfering H.F. energy is by-passed quite clear of the receiver.

Although this arrangement is especially applicable to D.C. mains, it may sometimes be used with advantage with A.C. supplies.

## Without an "Earth"

It is sometimes forgotten that every D.C. mains-operated set is automatically "earthed" by its connection to the supply system. Admittedly, this form of earth connection is often lacking in efficiency from the "H.F." point of view, but when an unduly noisy background of hum is present it is at least worth while to try the effect of taking off the normal earth wire.

When a marked improvement is noticeable as a result of working with a "mains earth" only, it will generally be found that there is an appreciable difference of potential between the "set earth" and the "mains earth." This provides a clue as to how disturbing hum voltages are introduced into the receiver.

## Locating Hum

When a moving-coil speaker has its field winding supplied from rectified A.C., hum is often found which no amount of juggling with the receiver circuits will eliminate. This hum originates in the field supply itself, and consequently it is to the field supply that one must turn for its elimination.

A certain test for this type of hum is to connect the moving coil to the output transformer in the usual manner, and then completely to disconnect the primary winding. Any hum which is then audible is coming from the field supply, and can only be stopped by smoothing the field current.

In the case of a low-voltage winding fed from a metal rectifier, a 1,000 mfd. or 2,000 mfd. electrolytic condenser in parallel with the field is often efficacious. With a high-voltage winding fed from a valve rectifier, however, it is usually necessary to insert a smoothing choke in series with the field, in addition to the usual 2 mfd. condenser in parallel with the winding.

## Harmful Interaction

One of the commonest sources of hum in an A.C. mains operated receiver is interaction between the mains transformer and the L.F. transformer. The usual rule for eliminating it is to disconnect the primary, connect across it a resistance equal in value to the preceding valve's internal A.C. resistance, and then to orientate the transformer to the position of minimum hum. This position is often critical, but it is usually quite definite, so that its exact location is easy.

When the connections are replaced to normal, however, it is sometimes found that the hum is reintroduced. In the majority of cases this hum will be found to be due to the preceding valve's H.T. supply, and can be removed by an increase in the smoothing. Occasionally, however, all efforts to remove the hum fail, and it persists no matter how much additional smoothing is included.

It is obvious that in such cases the H.T. supply is not the real offender, but there may appear to be no other possible source for the hum. It should not be forgotten, however, that the H.F. choke which is usually included in the detector anode circuit contains many turns of wire, and it often has a considerable external field. With chokes of this type, therefore, interaction with the mains transformer may be experienced, just as with an L.F. transformer. In obstinate cases of hum one should not omit to try positioning the H.F. choke.

In general, little trouble will be caused by small binocular chokes, and the tendency to pick up hum is at its greatest when using high-inductance chokes of the kind often employed in heterodyne whistle filters. This type of hum may, fortunately, be readily tested for by the simple procedure of short-circuiting the H.F. choke; if the hum continues, obviously the choke circuit is not at fault; if it disappears, equally obviously the choke is responsible for it.

## Danger Points

A certain amount of care should be taken in arranging the leads which, in an A.C. set, connect the power rectifier to the reservoir condenser and smoothing apparatus. Of course, the need for adequate insulation has always been recognised, as the positive lead is at a high voltage with respect to earth.

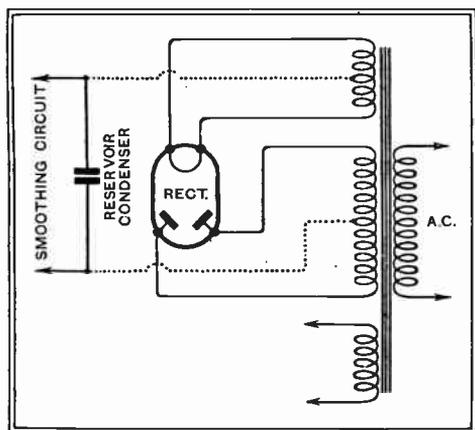


Fig. 11.—The rectifier output leads are likely to cause undesirable interaction.

Experience shows that, apart from the risk of insulation breakdown, there is a distinct risk of introducing hum if the leads in question are in inductive relationship with other leads and components in the receiver. The waveform of the current flowing in these wires is such that troubles of this nature are particularly likely to be provoked.

Fortunately, it generally happens that the rectifier, power transformer, and smoothing components are all mounted in close proximity to each other, and so the trouble does not often arise. But it is worth while bearing in mind, when a set is to be fed from a separate power supply unit that does not include smoothing equipment, that the reservoir condenser should be mounted close to the rectifier valve.

The two leads which are likely to give rise to induction troubles are shown in dotted lines in Fig. 11.

## Local Radiation

When the source of hum cannot readily be traced in a mains-operated set—and particularly in one of the D.C. type—it is advisable to try the effect of moving the receiver to another position in the room. This is because the disturbing voltages which give rise to this trouble are sometimes induced direct from concealed wiring in the walls. Radiation of this nature is often confined to the immediate vicinity of its source.

## Artificial Centre Tap

When the usual remedies for mains hum in an A.C. set have been tried and found to be ineffective it may be remembered that a misplaced centre-tap on one of the L.T. windings of a power transformer is not unknown, and may be largely responsible for the trouble. To unwind the transformer, and then to experiment with another position for the tapping, is a laborious task, not to be recommended to the amateur, but, fortunately, the use of an adjustable potentiometer, whereby an artificial centre point may be located accurately, provides a solution of the difficulty.

The connection of a potentiometer in place of the existing centre-tapping is quite simple, and, indeed, is only the work of a moment. The ends of the resistance winding are joined across the transformer winding, and the wire which was originally connected to the centre point is transferred to the potentiometer slider terminal.

A suitable value of resistance is about 20 ohms, and is by no means critical. Ready-made potentiometers, specially intended for this purpose, and which occupy very little space, are available commercially.

## Neutralising Hum

Many modern energised moving-coil loud speakers are fitted with a so-called "hum-bucking" coil, of which the purpose is to neutralise the effect of ripple voltages introduced into the field winding and so to prevent audible hum.

It must not be thought that when the connections of this hum-bucking coil are shown in a complete circuit diagram that they are an integral and indispensable part of the design.

The facts are that the hum-bucking coil is a local cure for a local trouble and, for instance, if a permanent-magnet loud speaker be substituted for one of the energised type, there is no need to be perturbed at the absence of the hum-bucking coil, which is no longer applicable.

## Good Smoothing Essential

In these days of variable- $\mu$  valves, the smoothing of the high-tension supply to the high-frequency stages need not be very thorough, since it is only by partial rectification that hum can be superimposed on the carrier as modulation. The smoothing to the output valve also need not be very complete, because hum in the anode circuit of this valve receives no amplification before reaching the speaker.

We are therefore left with the conclusion that the detector valve requires a more completely smoothed anode-current supply than any other valve in the set. From this we may draw the very reasonable conclusion that if hum is due to the H.T. supply, the chances are that it is being caused by insufficient smoothing in the detector anode circuit.

Even now that power detection has become usual, detector valves do not eat up a very vast anode current, so that a choke to smooth the supply to such a valve may combine high inductance with quite reasonable bulk. If there is a low-frequency transformer of antique pattern stowed away in an odd corner of the junk-box, it may therefore be worth while to resurrect it and see if it will serve as a smoothing choke for the detector valve only. The primary was probably intended for an anode current of the order of that which it will be called upon to smooth, but if burnt out it may be that the secondary, though overloaded, will provide inductance enough to reduce the remaining hum to silence.

# Adjusting and Trimming

**Accurate alignment of circuits under all conditions.—Matching tuning coils and condensers.—  
Improving detection and reaction control**

## Finer Points of Trimming

WHEN carrying out the somewhat delicate, but none the less intriguing, operation of adjusting the trimming condensers of a newly built receiver, it will often be found that one of these trimmers must be set to its minimum value. In practice this means that the maximum spacing allowed by the manufacturer must be given between the sprung condenser plate and the fixed back-plate which together constitute the usual balancing condenser. An indication is thus provided that the stray capacities existing across the individual circuit which requires a minimum of trimming capacity is already unduly high. Anything that can be done to reduce it will be all to the good, as it will allow a more extended waverange to be covered by the receiver.

Apart from such drastic expedients as tapping down the connections of tuning coils, etc., a good deal may often be done by rearranging the high-potential leads in such a way that they do not run in close proximity to earthed masses of metal. But the trimming condenser itself has often quite a high minimum capacity, and it is the purpose of this note to point out that matters may generally be improved by removing it altogether from the one circuit which is found to suffer from excessive "strays." As often as not these built-in trimmers may be unscrewed and removed without risk of damage to the main condenser assembly. But even if the trimmer support forms a part of the stator it may be possible to make a considerable reduction in its minimum value by removing the adjusting screw and bending the sprung moving plate clear of its fixed counterpart.

Having removed or disconnected the trimmer, it will be realised that there remains no means of balancing out discrepancies in the stray capacity of the particular circuit with which it was associated. Consequently it must be ensured that this particular circuit "takes charge" when the operation of ganging the set is begun. This is best ensured by reducing artificially the efficiency of all other tuned circuits by shunting a comparatively low value of resistance across each of them. The resistors may be of the composition or metallised type, and the safest points of attachment for them are the coil terminals. It may appear to be more convenient to apply the artificial load across the tuning condenser terminals, but one runs a risk of upsetting bias arrangements by doing so.

This method of procedure is illustrated diagrammatically in Fig. 12, where it is assumed—it will generally be the case in practice—that the maximum strays will be associated with the intervalve coupling circuit  $L_3$  and  $C_3$ . Consequently the trimmer across  $C_3$  will have been removed.

The loading resistors  $R_1$  and  $R_2$  are joined across the filter input circuits.

After having accurately tuned-in the signal to be employed as a guide in ganging, the next step, without touching the ganged tuning condenser, is to remove the loading resistor  $R_2$  and to adjust the trimmer of  $C_2$  for maximum response. The resistance  $R_1$  is then removed, and the circuit  $L_1 C_1$  is similarly treated.

In other circumstances than those under discussion it is often worth while to employ the same plan for ensuring that any particular unit of a series of ganged circuits shall "take charge" while trimming.

## Ensuring Accurate Ganging

It is worth while to bear in mind that the input capacity of a valve changes with variations in H.T. voltage or heating current, and as a consequence the stray capacity existing across its grid circuit is also subject to variation through these causes.

Therefore it follows that the operations of calibrating, or "ganging," a set should only be carried out when voltages throughout are those which will normally be applied when the set is in operation.

To carry the subject a little farther, it may be pointed out that when tuning "drifts," and the condenser setting corresponding to a known station is observed to have undergone a change, we have an indication that the power supply system may be behaving erratically, and that investigation is called for.

When setting-up a gang-tuned receiver it is usual to make initial trimming adjustments at the lower end of the medium waveband. On switching over for long-wave reception it is generally assumed that all circuits will still

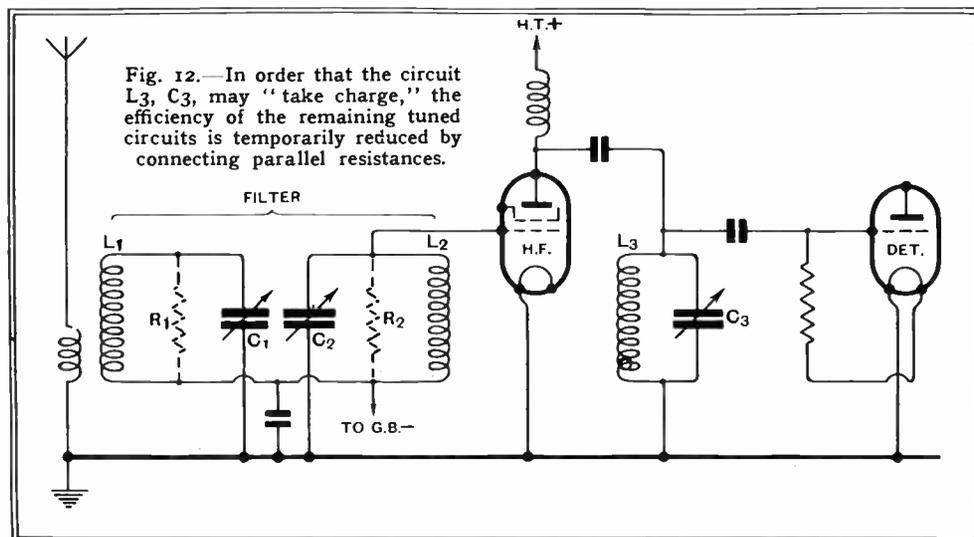


Fig. 12.—In order that the circuit  $L_3, C_3$ , may "take charge," the efficiency of the remaining tuned circuits is temporarily reduced by connecting parallel resistances.

remain in alignment, and that no further adjustment will be required.

To ensure this desirable state of affairs, there are two main requirements. The inductance values of the long-wave coils must be as accurately matched as on the medium

band; this point everyone will appreciate. The second need is that the stray capacities of each circuit in the chain should be proportionally the same as on the medium band. These "strays" need not have the same absolute value on each band; indeed, they are almost certain to be higher on the long waves. The point is that any additional

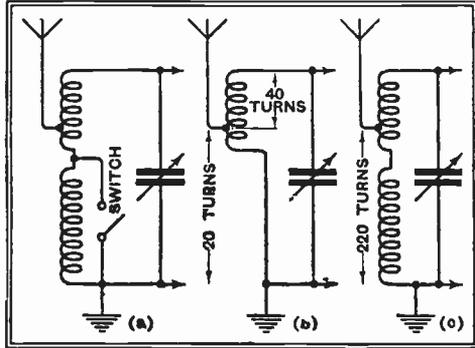


Fig. 13.—Explaining why the aerial input circuit (a) is unsuitable for a gang-tuned set.

capacity transferred on switching over should have an identical value for each circuit; it is only in this way that the initial trimming adjustment can hold good on both bands.

This being so, it will be appreciated that an aerial tuning coil such as that shown in Fig. 13 (a) can hardly be satisfactory in a gang-tuned set. Assuming that the medium-wave section be tapped so as to include one-third of its turns in the aerial circuit, the proportion of aerial capacity transferred to the tuned circuit will be quite small. But, on opening the switch for long-wave reception, the aerial will be connected across perhaps 90 per cent. of the total number of turns, with the result that nearly all its capacity will be additive to that of the tuning condenser.

Reasonably accurate alignment over both bands cannot possibly be maintained under these conditions. In order to ensure that the same proportion of aerial capacity is transferred on the long waveband the tapping might be changed over, for reception on that band, to such a point on the long-wave section that the same proportion of turns are included in the aerial-earth circuit.

Similar precautions should be taken when a tapped tuned-anode or tuned-grid intervalve coupling is fitted. Even with double-wound transformers it is a matter of some importance that the ratio between primary and secondary turns should be sensibly the same on both wavebands.

### Effect of the Aerial

It is worth while to point out that no system has ever been devised whereby the ganged tuning system of a receiver may be maintained in perfect alignment, irrespective of the capacity of the aerial with which the set is used. This is perhaps rather an academic than a practical point, as with most present-day designs imperfections in input circuit tuning, introduced by quite considerable changes in aerial capacity, are difficult to detect.

Still, it should be borne in mind, especially when the aerial is of non-standard dimensions, or when it appears that for any reason it may have a larger or smaller capacity than usual, that the ganging of a factory-built receiver may be out of alignment. Accordingly, the trimmer of the input circuit (that which controls the tuned circuit in direct association with the aerial) may possibly be adjusted with advantage.

### Stray Capacity Variations

The fitting of a gramophone pick-up to a "straight" set will almost always necessitate a readjustment of the trimming condenser which controls the tuned circuit immediately preceding the detector. The same applies to most superheterodynes, but as the tuned I.F. couplings are not fitted with auxiliary trimmers, the readjustment must be effected by means of the semi-variable condensers which are usually shunted across the windings. The only condenser that will need adjustment is that which tunes the secondary of the I.F. transformer preceding the detector valve.

### Hand-capacity

The adjusting screw of a trimming condenser (built into a ganged tuning condenser) is invariably in electrical connection with the "earthy" side of the circuit, and, in consequence, there should be, theoretically, no risk of disturbing tuning by body-capacity effects while these trimmers are being adjusted.

But occasionally it will be found that, in order to make the adjustment, the metal shank of a screwdriver may come into sufficiently close proximity with high-potential connections or components to introduce a change in the tuning of the associated circuits. In this way misleading effects may be encountered, and it is not a bad plan to make a

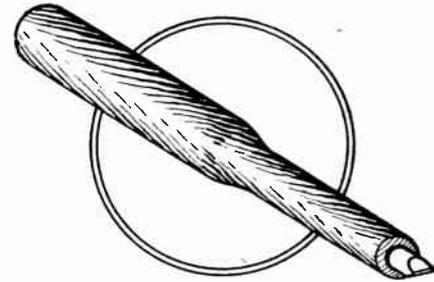


Fig. 14.—A special trimming screwdriver.

special trimming tool. This device is nothing more than a screwdriver with the shortest possible metal blade, and a fairly long handle of insulating material—wood is quite good enough for this purpose.

As trimmer adjusting screws generally turn quite freely, it may be quite permissible to avoid the use of metal altogether, and to make a special screwdriver with some such insulating material as a strip or rod of bakelite, paxolin, or ebonite.

When dealing with circuits where adjustments are exceptionally critical, it is perhaps worth while to take some pains to see that the screwdriver blade shall be an exact fit in the slot of the adjusting screw. If this is done all backlash is avoided, and it will be found that adjustments can be made more accurately, and certainly much more easily, than when the width of the slot is considerably greater than the width of the blade.

### Coils or Condensers Faulty?

It is usual to adjust the trimming condensers of a gang-control receiver at the lower end of the medium waveband. Then, if the receiver be tuned to a station at the upper end of the same waveband, and it is found that signal strength can be appreciably improved by adjustment of

any one of the trimmers, it must be concluded that either the coils or the ganged condensers are not properly matched.

The question is, which? In some cases it is quite a pretty little problem to obtain experimentally a definite answer to the question, and the matter becomes rather too complex for these notes. But if it happens that all the coils used in the receiver are identical, and so interchangeable from one position to another, it is an easy matter to form almost, if not quite, a definite opinion.

Briefly, the scheme is to adjust the trimmers accurately at a given wavelength—preferably a fairly low one—and then, without altering anything else, to interchange the various coils. Still working on the same wavelength, the next step is to see whether signal strength can be improved by readjusting the trimmers. If it can, the coils are definitely at fault. On the other hand, if no improvement can be made, the fact that ganging did not originally hold at the higher wavelength must be ascribed to misalignment in the condensers.

### Matching Coils

If a series of tuning coils be wound with precisely the same number of turns of similar wire on formers of the same diameter, it follows that the inductance value of each of them should be identical; the coils should therefore be suitable for inclusion in a gang-tuned receiver without further matching.

But in practice minor discrepancies, due perhaps to slight differences in the diameter of the former, or, more probably, to unequal closeness of winding, are likely to arise. These discrepancies may well be so slight that the somewhat brutal procedure of matching by the removal of complete turns should be quite unnecessary. Instead of doing this, it is usual to reduce the inductance of those coils which have a surplus by "spreading" a few of the turns at one end of the winding rather in the manner shown in the accompanying illustration. This adjustment is done by hand after the coils have been wound.

Some means must be found to ensure that adjustments made in this way shall remain constant, and that the loosened turns of wire will not change their position; with this object, it is usual to employ some form of insulating

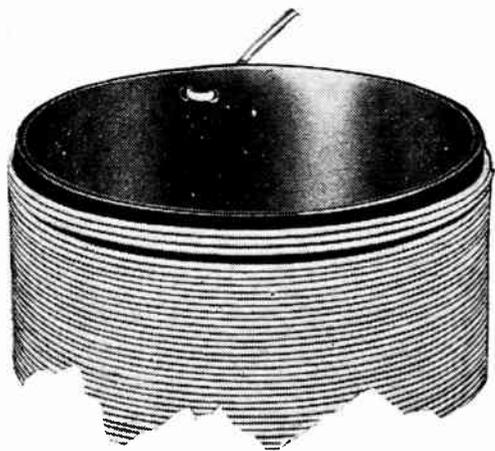


Fig. 15.—Adjusting inductance by "spreading" the end-turns of a coil.

varnish or other adhesive to anchor the end-turns in position. For this purpose ordinary rubber solution has been found highly satisfactory, and to be entirely free from objectionable features. The solution should not be used

indiscriminately, it is sufficient to smear it lightly over a small part of the upper surface of the former just before the coil is wound. Adjustments are preferably made while the solution is "tacky," but before it has finally set.

### Aids to Adjustment

The suggestion is often made that some form of measuring instrument—even if it be nothing more elaborate than a detector anode milliammeter—should be employed when making initial adjustments to a new receiver, and particularly when carrying out the operation of setting the trimming condensers which are included in all receivers with ganged tuning.

It would be foolish to attempt to belittle the soundness of this advice, for it is a demonstrable fact that, however carefully adjustments may be made with the ear as a guide, results can nearly always be improved upon with the help of a more certain and definite indication. But it is also a fact that too great a reliance upon the meter can be dangerous, as all sorts of puzzling effects may arise if the old-fashioned "listening test" be ignored entirely.

For instance, meter deflections may actually be due to self-oscillation of one or more valves of the receiver, or perhaps to a carrier wave instead of a local oscillator, to the emanations of which it is imagined that the receiver is being tuned.

Unless one has a great deal of experience of instrument work it is perhaps best to make rough initial adjustments by aural means, and then, with the meter as a guide, to give the final touches which make all the difference to the ultimate success of a modern set.

### Screened Aerial Down-leads

Some of the latest screened cable for aerial down-leads has remarkably low capacity, but, even so, its use will generally result in the addition of several hundred micro-microfarads to the aerial capacity. Of this extra capacity a proportion—but, in a modern set, usually only a small one—will inevitably reappear across the tuned input circuit of the receiver.

The moral of this is that, after fitting a screened down-lead, the aerial circuit of a "ganged" set should always be retrimmed; less trimming capacity than originally will be required, and so the adjusting screw must be turned in an anti-clockwise direction.

### Detector Voltage Adjustments

In the most popular type of battery-driven set, using the H.F.-det.-output circuit, there is often some difficulty in finding the best anode voltage for the detector. If such a set is used for the reception of distant stations, it becomes necessary to choose this voltage chiefly with an eye to the smoothness of reaction, which is the dominating factor in determining its behaviour for long-range reception. For this purpose a low voltage, in the neighbourhood of 50 volts, or even less, is generally most favourable.

But when the set is tuned to the local station quite different considerations arise. There is now no longer any question of using reaction to the limit to get good strength, so that if reaction becomes "ploppy" no harm is done. Since the detector valve will usually overload before the output valve if the anode voltage on the former is too low, it will in most cases be found best to put the volts on the detector up to the highest available, thereby checking this annoying tendency to overload when strong signals are being received.

The rule then emerges; for local reception put 120 to

150 volts on the detector, but for distant reception cut the detector-voltage down until reaction becomes smooth. This moving of the wander-plug must be regarded in the same light as the "Local-Distance" switch fitted to some of the larger sets. It might be worth while, in cases where it can be done without too much trouble, actually to fit a switch for changing over the detector anode voltage from "high" to "low."

### Stabilising Eliminator Voltage

When dealing with a set fitted with battery valves which is fed with H.T. current through an eliminator, it is often desirable to elaborate the normal procedure by providing for the maintenance of screening grid voltage at a reasonably constant value which will not be seriously affected by variations in current brought about by changes in bias.

In the simpler type of eliminator a main output voltage terminal delivering approximately 150 volts is provided for feeding the anodes of all H.F., L.F., and output valves; a special detector feed may be fitted, and, in addition, there is almost always a variable voltage output, generally controlled by a potentiometer, for supplying the screening grid. As a rule, the fixed and variable resistances of which this potentiometer is composed are of high resistance, and consequently regulation of voltage output will be bad. In other words, it will tend to fluctuate violently in sympathy with alterations in current loading.

This is not a serious objection when ordinary S.G. valves are employed, as the screen grid voltage is usually set

initially to the best value, after which nothing is likely to occur which will alter it.

Regulation of most eliminators may generally be improved by increasing the normal current consumption of the potentiometer by shunting an extra loading resistance across the H.T. negative and variable output terminals

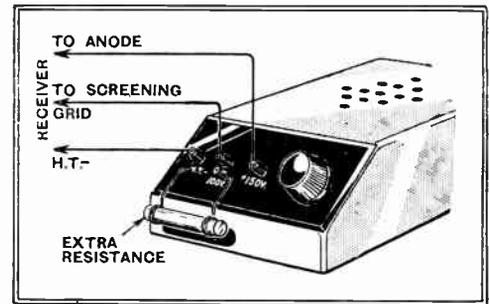


Fig. 16.—Improving H.T. voltage regulation by connecting an extra resistance.

in the manner shown in Fig. 16. In most cases, a resistance value of 20,000 to 30,000 ohms will not be too low, but care must be taken that this addition does not result in overloading the built-in potentiometer or reducing voltage output excessively. The guiding principle should be to use as low a resistance as possible.

## Measurements and Calculations

*Some easily remembered rules.—When the voltmeter can be depended upon, and when readings are likely to be excessively low.—The safety limit of resistances*

### Useful Rules of Thumb

IN almost every art or science there exists a vast collection of empirical formulæ or rules of thumb which are in constant use—unashamedly by amateurs and dabblers, and surreptitiously by highbrow professionals. It is unfortunate that our own art is somewhat deficient in these easily remembered rules, and such as exist are open to criticism on scientific grounds. Nevertheless, there are a few that are worth while remembering, and which will be accurate enough for most practical purposes. For the benefit of readers, three of the best-known ones are enumerated below.

(1) *Wavelength is directly proportional to turns* (in a tuning coil).—This is a very useful rule. If, for example, a simple short-wave receiver can be tuned to a wavelength of 30 metres with a four-turn coil, there is little doubt that a wave-length of 15 metres will be receivable with a coil of similar diameter having two turns.

(2) *Frame-aerial windings*.—For a frame aerial wound in a more or less conventional manner, and of roughly the usual size, a total length of 75 feet of wire will provide suitable inductance value for tuning to the medium broadcast band with a 0.0005-mfd. condenser. For a long-wave frame a total of about 250 feet of wire would be necessary.

(3) The correct value of negative grid bias to apply to a three-electrode amplifying valve is ascertained by dividing "H.T. voltage applied" by "twice amplification factor" (of the valve concerned).

This rule tends to become inaccurate when it is applied to modern valves of exceptionally high efficiency.

### Voltage-absorbing Resistances

Although it is easy enough to calculate the voltage absorbed in a resistance used, say, for the purpose of decoupling, those of us who do not shine at mental arithmetic generally have to take a pencil and paper to the task, at any rate if we are not dealing with round figures. The procedure, of course, is to multiply current, expressed in amperes or fractions of an ampere, by resistance (in ohms), the product being the voltage lost in the resistance.

A handy rule to remember, and one that is applicable to most wireless receivers, is that each thousand ohms of resistance absorbs one volt at one milliampere. For example, a 1,000-ohm resistor, passing 5 milliamperes, will absorb 5 volts. Take another case that is likely to arise in practice: that of the anode circuit of a power-grid detector, estimated to pass 8 milliamps, and where it is desired to fit a 20,000-ohm decoupling resistance. Applying the simplified formula, we see that the voltage loss will amount to  $20 \times 8 = 160$  volts.

When dealing with bias resistances, it is, perhaps, more convenient to remember that 0.1 volt is developed across each 100 ohms for each milhamp. flowing in the circuit.

### Voltage Measurements

When a voltmeter is used to measure the H.T. voltages existing in a mains-driven receiver, there will inevitably be some error. The meter will show something less than

the true voltage, and the greatest error will exist when the circuit resistances are high and when the meter resistance is low. Further, it should be remembered that voltage readings will be wildly inaccurate when the current consumed in the particular circuit under test is less than, or even comparable with, that required to actuate the meter.

A knowledge of these facts enables us to decide to what extent the indications given by the voltmeter may be trusted. Imagine that it is desired to measure the various H.T. and anode voltages in a typical H.F.-det.-L.F. set, such as that shown in skeleton form in Fig. 17. With the meter connected in position A, the total H.T. voltage may be read with a high degree of accuracy, for the reason that the internal resistance of the rectifier and smoothing system is low, and also because the extra current required to deflect the meter needle is bound to be considerably less than that flowing in the common anode circuit.

On transferring the instrument to position B, the H.T. voltage on the anode of the output valve may also be checked with hardly impaired accuracy. This is because

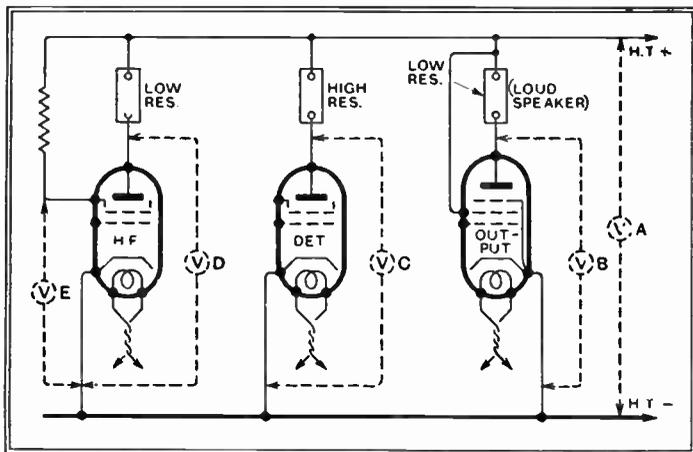


Fig. 17.—Reading anode voltages of a typical receiver.

the extra resistance of the output valve load will probably amount to no more than a few hundred ohms, and there will be no decoupling resistance in this circuit to add to the error.

In measuring detector anode voltage, allowance must be made for a very considerable error; this is because the circuit nearly always includes a decoupling resistance of many thousands of ohms, and sometimes a coupling resistance as well. It may therefore be assumed quite definitely that the voltage shown by the meter C will be at least 20 or 30 per cent. low, and in some cases it will indicate less than half the true difference of potential existing between anode and cathode.

In H.F. circuits a decoupling resistance of a few hundred ohms is generally sufficient, and the ohmic resistance of H.F. coupling devices is negligibly low. It may therefore be expected that a reading of H.F. valve anode voltage taken by connecting the meter in position D will be reasonably accurate. Screening grid circuits, on the other hand, almost always include high resistances, and so the voltage read at E will be very much below the true value.

### Current-carrying Capacity

No longer is it safe to ask for, say, a 2,000-ohm wire-wound resistance, and blindly to assume that it is certain

to carry any current that is likely to be forced through it. High voltages and relatively heavy anode currents are the order of the day, at any rate in mains-operated sets; immunity from breakdown, combined with economy, are the rewards for exercising a certain amount of discrimination in choosing resistors.

These components are generally rated in terms of the wattage that may be dissipated in them, and in order to assess the stability of a given resistor for any particular position in a receiver, it becomes necessary to translate its "watts" rating into current-carrying capacity in rather a roundabout way.

The first step is to determine the voltage that will be absorbed by the resistor when it is connected in the receiver. This is ascertained by multiplying resistance (in ohms) by current (in amperes or fractions). Wattage is then found by multiplying "volts absorbed" (as ascertained by the preceding calculation) by "current."

All this applies, of course, to resistances used for the purpose of automatic grid bias, as well as those in the valve anode circuits. As an example of a practical problem, we may take the case of a 600-ohm bias resistor for a valve consuming 50 milliamperes (0.05 amp.). The voltage dropped across the resistance will be 30, and consequently the wattage dissipated will be 1.5 watts.

### Extending Milliammeter Range

It sometimes happens that one wishes to find out what is happening in the anode circuit of a particular valve, but no milliammeter of a suitable current range is available. For example, those who purchased 0.2 milliamp. meters for insertion in their detector anode circuits in the days when currents were always low will very probably have now changed over to power grid detection, and so this milliammeter will be apparently useless. When it is necessary to obtain only comparative readings and not absolute values of current, a milliammeter of the type in question may be modified quite satisfactorily by fitting a low-resistance shunt. The exact value of this shunt cannot be given without a knowledge of the internal resistance of the meter, etc., but it can be arrived at very simply by the method of trial and error.

Before switching on the receiver, the meter is wired in circuit, and across it is connected a filament rheostat of some 15 or 20 ohms, set at minimum resistance. After switching on the receiver, the resistance of the shunt is gradually increased until a sufficient deflection of the meter needle is obtained.

### Absorbing Surplus H.T. Output

Although it may seem to be a terribly inefficient and extravagant procedure, often the best way of keeping down the output of a rectifier valve to the desired voltage is to shunt it with an absorbing resistance. This plan is generally adopted when the current to be drawn from the rectifier is considerably below its maximum rating. If no additional load were imposed a rise of voltage would take place, and the smoothing condensers might suffer; herein lies the real advantage, as the use of high-voltage condensers may be avoided by adopting this scheme. Further, the value of the parallel absorbing resistance may in most cases be estimated in a very simple way.

Take a case that is likely to arise in practice—that of an "A" type rectifying valve designed to give about 250 volts at 60 mA., but to be used, in conjunction with a

standard "A" transformer, to feed a set requiring only 20 mA. at 250 volts. At this relatively light loading voltage might rise to some 300 volts; this rise can be prevented only by ensuring that the total load will amount to 60 mA. What we need to know, therefore, is the value of shunt resistance which will absorb the surplus current—in this example, 40 mA.

The necessary resistance (in ohms) is here ascertained by dividing "voltage" by "surplus current," the latter ex-

pressed as a fraction of an ampere. In this case we get  $250 \div 0.04$ , equal to 6,250 ohms.

The voltage figure used in these calculations is not necessarily the maximum rated output, nor is the system of voltage regulation applicable only to a simple rectifier; an H.T. eliminator may be treated in the same way. Knowing the voltage output for a given consumption, it is easy to estimate the right value of absorbing resistance to maintain that voltage at any lesser consumption.

## Tone and Volume Control

**Reducing or increasing proportional amplification of bands of audio frequencies.—Reducing H.T. current consumption by controlling volume.—Avoiding overloading while receiving the local station.—Refinements in volume control**

### For Speech Reproduction

AS almost every form of manual tone control introduces a loss in amplification, which becomes greater as its effect in changing the frequency characteristics becomes more drastic, it follows that in order to obtain best possible results from the use of these devices it is desirable to have a satisfactory form of volume control. Most modern sets have a "pre-detection" control whereby input to the detector or to the H.F. valve may be regulated, but if the detector itself is to be operated under the best possible conditions it is often an advantage, when tone control is employed, that means should be provided for varying L.F. amplification as well. This is particularly likely to be true when operation of the tone control introduces a great difference in average magnification.

There is another aspect of the question of tone control and volume to which attention may be drawn. As speech is often transmitted at the same intensity as music, it is generally agreed to be desirable to reduce its relative intensity. Although it may sound like heresy to a certain school of thought to suggest that this may satisfactorily be done by operating the tone control in such a way that the lower register is heavily attenuated, a good case can be made out for this procedure. The general level of reproduction will be reduced, and almost invariably speech will actually gain in intelligibility by removal of much of the bass.

### The "Local-distance" Switch

One of the greatest advantages conferred by the variable-mu H.F. valve is that volume may be controlled in an extremely satisfactory manner by variation of its grid bias voltage. In order that signal strength may be reduced to a sufficient extent, arrangements are usually made for varying the bias progressively from the optimum value of a volt or so to anything up to some 30 volts negative.

But even when the maximum available bias is high it is not always possible to reduce signals from a powerful nearby station to inaudibility, or even to a comfortable strength. Insufficient control is particularly likely to manifest itself in sets with only one controlled stage, and also in battery receivers where it may be inconvenient to use a sufficiently large bias battery.

As a supplementary control, to be used only when receiving a local station for which grid bias adjustment may be inadequate, it is a good plan to fit some form of desensitising device which may be thrown into operation

at will. Such a device is generally known as a "local-distance switch," and, of course, must be capable of bringing about a drastic reduction in overall sensitivity.

Of all the methods that have been suggested for the purpose it is doubtful if any are greatly superior for all-round use to the simple expedient of shunting the aerial-earth circuit by a resistance of 50 to 100 ohms. This resistance, of course, is connected across the circuit at will by means of a switch, as shown in Fig. 18.

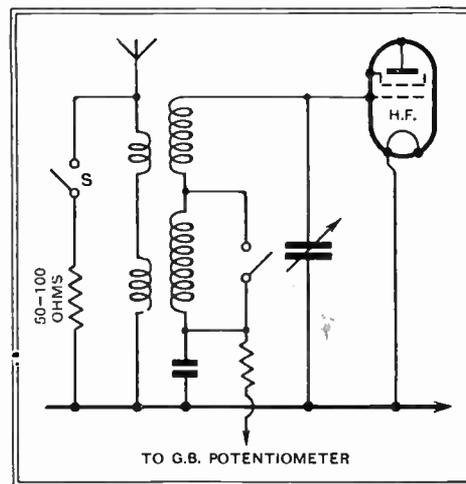


Fig. 18.—Connections of a "local-distance" switch S.

The only disadvantage of a local-distance switch is that one is apt to forget its existence, and to attempt to tune in distant stations when the switch is closed!

### Attenuating Low Notes—

A very satisfactory form of tone control, affecting proportional amplification to the lower and middle frequencies only, consists of an air-cored L.F. choke, in series with a variable 25,000-ohm resistance, shunted across the primary of the L.F. transformer. This arrangement has the advantage that it is applicable to the majority of modern receivers. A suitable inductance is 0.3 henry, and chokes of this value are obtainable commercially for a few shillings.

When the variable resistance is set at its maximum value, the choke is not effective to any great extent as a shunt for low frequency impulses, and so practically no modification of tone is introduced. Attenuation of the

lower register increases proportionately as the value of the resistance is reduced.

A device of this sort can be turned to good account for compensating for over-emphasis of low notes in sharply tuned circuits.

### —And Increasing Their Strength

A valve of fairly high magnification factor, and consequently of relatively high A.C. resistance, is generally the most sensitive type to choose as a grid detector, but its use may introduce an appreciable attenuation of the lower audio-frequencies. This applies when the succeeding output valve is connected by means of a transformer, of which the primary winding is directly in the anode circuit.

A simple remedy for this state of affairs is to be found in the use of resistance feed for the transformer primary. The effect of this alteration is always to reduce the effective resistance of the valve, as the feed resistance is, for all practical purposes, in parallel with it. All other things being equal, the bass response of a resistance-fed transformer is bound to be better than with the direct form of connection.

### Remote Volume Control

An important but rather neglected property of the variable- $\mu$  H.F. valve is that it allows the installation of a volume control device at a point remote from the receiver. With these valves control is always carried out by changing the sensitivity of the valve by variation of its grid bias; this operation in nearly every case is effected by means of a potentiometer.

In the simplest case, all that one has to do in order to arrange for a remote control scheme is to remove the potentiometer from the set, to instal it at the distant point, and to extend the existing leads; this is shown diagrammatically in Fig. 19 (a), which will be recognised as the conventional control circuit.

It will be observed that three wires are connected between the receiver and the distant control point, but one of the conductors may be omitted by making use of an "earth return," if convenient to do so; for instance, where a distant control is permanently installed the connections might be made with twin lead-covered wire, of which the metal sheathing will serve as an "earth." Capacity between the control wires and to earth is of no importance, but there is a faint possibility that hum may be introduced, at any rate if the wires are unshielded and run parallel to the house wiring.

In many cases it may be considered desirable to connect the remote control leads to the set through a plug-and-socket device in order that a "local" control potentiometer may be substituted.

Although the connections to the volume control potentiometer are all at low potential, and so there should be

no risk that they might cause instability, it is a fact that energy is transferred between grid and plate circuits in many unaccountable ways, and experience shows that there is a slight possibility that instability may be introduced by the fitting of extension leads. Should this trouble arise it may quite easily be prevented by the fitting of decoupling, as in Fig. 19 (b), in which the extra components required for this purpose are indicated by C,  $R_3$ , and  $R_4$ .

As a general rule all the additions shown will not be necessary, and a start may be made merely by fitting the by-pass condenser C in the screening-grid circuit. If this fails to remove instability completely, the next step is to insert the resistance  $R_3$ , which may be of 500 or 600 ohms; this extra resistance will not sensibly affect the voltage distribution of the circuit. As a next step the extra condenser C in the cathode circuit should be added, and finally the resistance  $R_4$ . There is some slight difficulty about the addition of this resistance; in the very unlikely event of it being necessary, it seems best to divide the existing cathode resistance into two parts of equal ohmic value; one of these resistances is used in the normal position, and the other serves as the decoupling resistance  $R_4$ .

### Graded Potentiometers

Those who use the ordinary type of potentiometer for volume regulation will notice that this device seems to work most effectively over a limited range of rotation of the control knob. In its most usual application there is little apparent falling off in loudness when the slider is moved, say, from the "maximum" end of the resistance to the mid point, but further rotation in an anti-clockwise direction begins to have a very appreciable effect.

These remarks apply mainly to post-detection volume

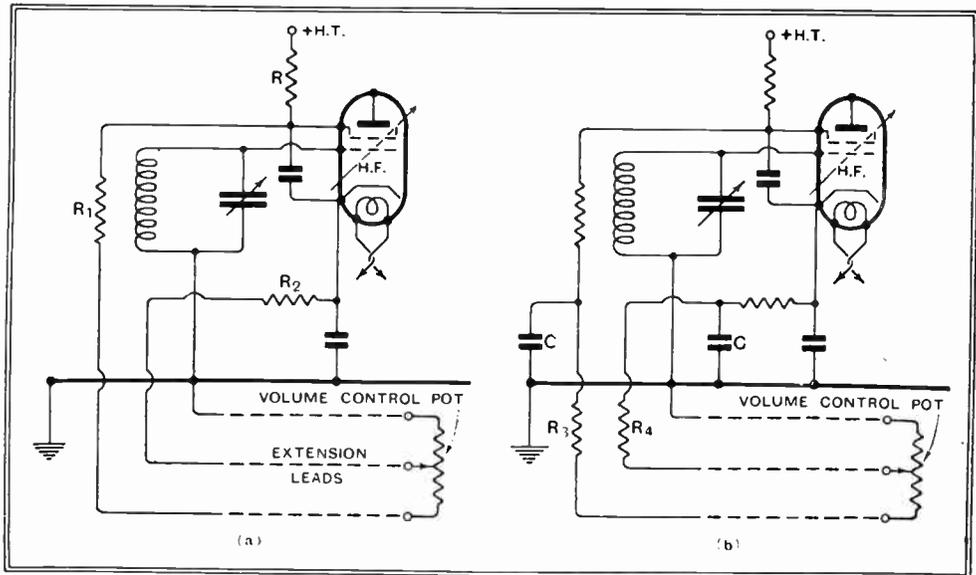


Fig. 19.—Fitting a volume control potentiometer externally to the receiver.

controls, and especially to potentiometers used in conjunction with gramophone pick-ups. The effect is basically due to the fact that the sound-wave output from the loud speaker is proportional to the square of the input voltage applied to the amplifier which feeds it. In other words, although the voltage applied from a gramophone pick-up may be reduced to a half by setting the potentiometer slider at the mid point of its travel, the apparent loudness

of reproduction will not also be halved, or anything approaching it.

This lack of uniformity in volume controls is often overcome by fitting a "graded track" potentiometer, of which

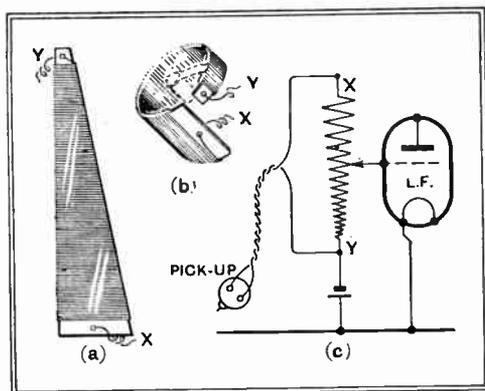


Fig. 20.—Tapered wire-wound resistance elements, and how to connect them for volume control purposes.

the resistance element is tapered more or less in the manner shown in Fig. 20 (a) and (b). With the ordinary straight-line potentiometer, equal angular displacements of the contact brush will bring about equal changes in resistance, but with the newer type of component matters are arranged differently. Referring to diagram (a), it will be appreciated that a single turn of wire at the end of the resistance strip marked X will have a much greater length, and so a much greater resistance, than at the other end. In consequence, the resistance of the element is not equally distributed along its length.

By a suitable distribution of the resistance it is possible to obtain sensibly a "linear" control of volume, or equal increments of loudness for equal angular displacements of the contact brush. Those who use this type of potentiometer should realise that it is a matter of importance that it should be connected the "right way round." The high-

resistance end of the element should always be joined to the high-voltage end of the circuit; this point is shown diagrammatically in Fig. 20 (c).

## Double-acting Control

The sensitivity of most modern sets is regulated by means of a variable resistance or potentiometer, which is generally arranged to decrease the sensitivity of the H.F. amplifier by over-biasing the grid of the valve (or valves). Those who have fitted a gramophone pick-up to an existing receiver may have wondered whether it is possible to make this resistance serve the dual purpose of radio and gramophone volume control.

Unfortunately, it is hardly practicable to do this, as a fairly elaborate switching scheme would be required in order to enable the potentiometer to carry out both functions. But if we cannot avoid the use of two potentiometers, we can at least avoid two control knobs by making use of one or other of the many modern components that may be linked together mechanically in such a way that their spindles rotate simultaneously.

Although the "radio" and "gramophone" potentiometers may be mechanically linked—or ganged—it by no means follows that they will be electrically inter-connected; as a rule the wiring to each will be entirely separate.

## Volume Control & Economy

Users of battery-fed receivers in which volume is regulated by variation of negative bias applied to the H.F. valve should remember that, when using the set for gramophone reproduction, the "radio" volume control should always be set at minimum. In this way H.T. battery current is conserved; with maximum bias, anode and screening grid current combined will usually amount only to a matter of microamperes, whereas with the bias potentiometer set for maximum sensitivity, it may rise to 3 or 4 milliamps.

As an alternative to this plan, there is no reason why, in a battery set, an extra switch should not be fitted in to break the filament circuit of the H.F. valve.

## Pick-ups and Gramophones

*How to fit a pick-up to an existing receiver.—Reducing needle scratch.—Preventing overloading of the first amplifying valve*

### Pick-ups and Diodes

IT will hardly be necessary to say that the usual procedure of inserting a pick-up in the grid circuit of a detector valve is not applicable when diode detection is employed. The two-electrode detector is no more an amplifier than is a crystal, and without a very elaborate switching scheme cannot be made to act as one.

The rule to apply when converting such sets for gramophone reproduction is to connect the pick-up in the grid circuit of the L.F. valve which immediately succeeds the diode. In order to isolate the latter a change-over switch may be employed, but when dealing with battery-operated sets the somewhat simpler plan shown diagrammatically in Fig. 21 may be preferred. In addition to the usual switch by means of which the pick-up is connected, another switch is connected in the diode filament circuit; this should be opened when the

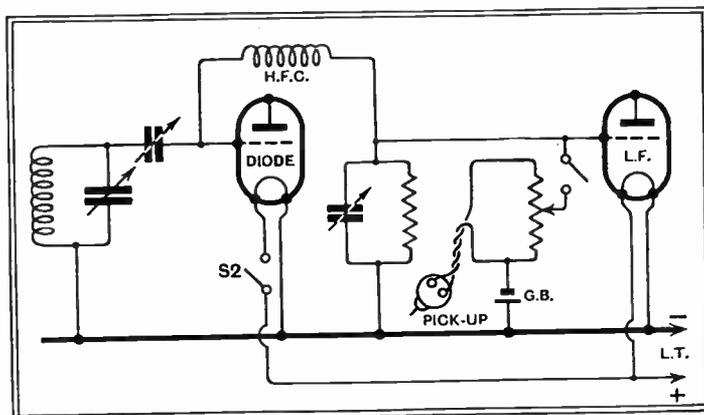


Fig. 21.—Connecting a pick-up to a receiver with diode detection.

set is being used for gramophone reproduction in order to interrupt the diode filament circuit.

Of course, this arrangement applies only to battery-operated sets, in which, incidentally, it is economical to make provision also for extinguishing the filament of the H.F. valve while the pick-up is in use.

### Fitting a Pick-up

When making provision for the addition of a pick-up to an existing receiver, it is worth while to mount the radio-gramophone change-over switch as close as possible to the valve with which it is associated. In nine cases out of ten this valve will be the detector, which will have to deal with both H.F. and L.F. impulses.

Although this precaution is perhaps not of very great importance when the simplest form of switching is fitted, it

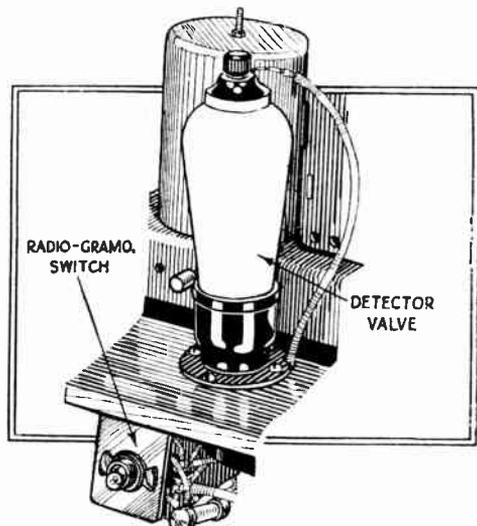


Fig. 22.—Ideal position for a radio-gramophone change-over switch.

is certainly highly desirable when a change-over switch is used, as, for example, that shown in the accompanying illustration. Two of the leads connected to the switch carry H.F. currents.

If it is impossible to mount the switch in close proximity to the valve it may be found necessary, in order to prevent instability, to shield one or more of its connecting leads in metal-braided sleeving. This course, though unobjectionable from most points of view, may add so much extra stray capacity to the associated tuned circuit that the waveband covered by the receiver will be restricted.

### Simple Scratch Filter

Fairly elaborate filters are sometimes employed to restrict the high-frequency response of gramophone pick-ups, and thus to reduce needle-scratch. Although a good case can be made out for the use of these devices, it may be borne in mind that the very much simpler alternative of a variable resistance, connected in shunt with the pick-up, is often surprisingly effective, and is always worth while trying when the use of a tone-lowering device is indicated.

A maximum of some 50,000 ohms is generally suitable for the resistance; its use will, of course, tend to reduce sensitivity, but this is seldom a drawback, as the average pick-up nowadays has a voltage output in excess of normal needs.

The connection of a shunt condenser has a similar effect

but may tend to introduce an objectionable resonance, and thus to defeat the object for which it is used.

### Mechanical Insulation

In a self-contained radio-gramophone with built-in loud speaker a more or less serious resonance effect is sometimes caused by the transmission of vibration from speaker to receiver. Although modern valves are not usually microphonic, the possibility that this defect is responsible should not be ruled out entirely. Again, vibrations may be of such an amplitude that the condenser vanes will be affected, and this is particularly likely to cause a puzzling effect in a superheterodyne.

Whatever the precise cause of the trouble may be, mechanical insulation will generally cure it, and it is not a difficult matter to mount the entire receiver chassis on blocks of sponge-rubber or similar material. Of course, all the good done in this way would be entirely offset by screwing the control spindle bushes rigidly to the front of the cabinet; to use an electrical analogy, this would short-circuit the mechanical insulation afforded by the rubber. When this plan is adopted it is generally best to make the control panel integral with the receiver chassis, and to cut a vignette in the face of the cabinet to expose the control knobs.

It will sometimes be easier to attack the problem from an opposite angle, and to insulate the loud speaker itself in such a way that the vibration from it cannot be transmitted to the receiver through the woodwork. To do this the loud speaker is screwed to a sub-baffle measuring perhaps a foot square, which is mounted behind the "fret" of the cabinet. Again, strips of insulating material, such as felt or sheet sponge-rubber, must be interposed between the sub-baffle and the cabinet as suggested in the accompanying sketch. Further blocks of insulating material must be placed under the clamps by which the sub-baffle is held in position.

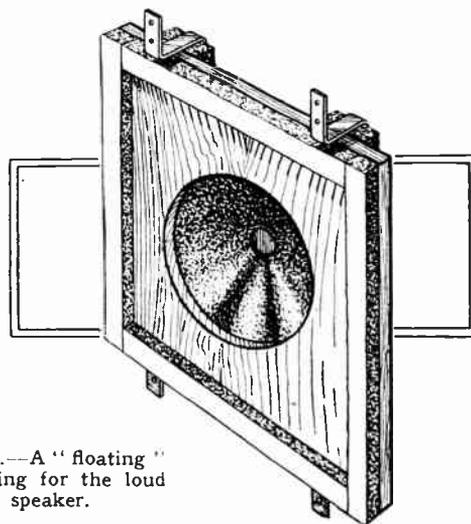


Fig. 23.—A "floating" mounting for the loud speaker.

These precautions should remove the cause of certain types of resonance, and also of howling, provided the latter be due to mechanical reaction and not to electrical reaction. Before going to the trouble of providing insulation in the manner suggested it is not a bad plan to make a test by temporarily removing the receiver from its cabinet, connecting the loud speaker by long leads, and then observing whether performance of the set is improved.

## Fixed Input Control

When a receiver already includes a post-detection (or L.F.) volume control, it might appear that the addition of a pick-up would not involve the fitting of any additional means for regulating intensity. But the voltage output of most modern pick-ups is quite high, and if it be applied in full to the grid of the average detector valve (temporarily converted into an L.F. amplifier), it is more than probable that overloading will be produced. The fact that volume may be cut down to any required level by operation of the existing post-detection control does not in any way obviate the ill-effects of this over-loading.

In cases such as those we are considering, the expense of an extra variable potentiometer may be avoided by shunting the pick-up with a fixed potentiometer, as shown in Fig. 24.

The combined ohmic value of the two resistances forming the potentiometer should equal that recommended by the makers of the particular pick-up that is to be used. The proportion of the pick-up output voltage that will be applied to the grid is determined by the relative value of the two resistances; if it is desired to apply only half the available voltage, then they may be of equal value. With a sensitive pick-up and a receiver giving high magnification it will probably not be necessary to use more than one-quarter of the available pick-up voltage; in this case the resistance of R<sub>1</sub> should be three times that of R<sub>2</sub>.

In order to compensate for the loss of high notes that may result from making a drastic reduction in applied pick-up voltage, the upper limb of the potentiometer may be

shunted with a semi-variable condenser, as shown in dotted lines. To strengthen high notes the value of the condenser is increased by screwing its knob in a clockwise direction.

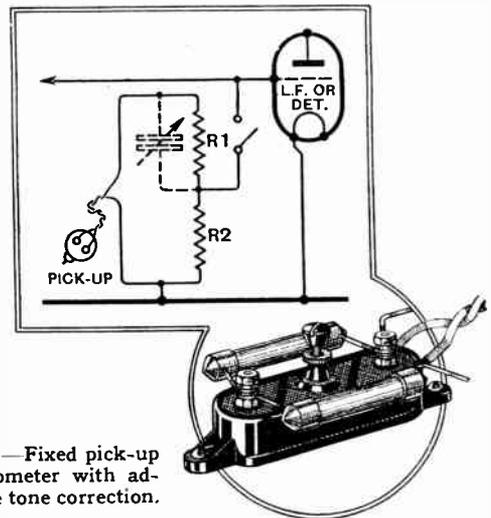


Fig. 24.—Fixed pick-up potentiometer with adjustable tone correction.

This method of tone control, though so simple, is extremely effective, especially if the associated resistances have high values. Assuming R<sub>1</sub> to be something between 100,000 ohms and  $\frac{1}{4}$  megohm, a maximum capacity of 0.001 will be about right.

## The Loud Speaker and the Output Stage

**An aid to loud speaker adjustment—Modifying an existing receiver for Class "B" amplification—A highly effective baffle for an external loud speaker—Wiring extension loud speakers without introducing distortion.**

### Adjusting the Moving Coil

THE clearances allowed in moving-coil loud speaker construction are usually very small, and so it is not surprising that the worst sometimes happens, and the moving coil

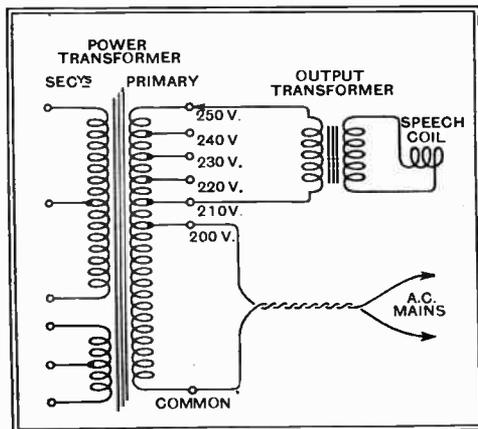


Fig. 25.—Alternating voltages of between 10 and 50 volts may be obtained, for test purposes, from the primary windings of a power transformer.

makes intermittent contact with the sides of the gap in which it works. This highly undesirable rubbing contact may take place at all positions, or it may only occur towards one end of the travel of the coil. In all cases the result is serious distortion, and, as a rule, a reduction in volume.

A rubbing contact between the moving coil and the magnet is not so easy to diagnose as one might expect, and probably the simplest and most certain way of making sure that this trouble is present is to listen to the loud speaker when it is reproducing a sustained pure note of constant intensity, and preferably low periodicity. If the trouble in question is present a secondary frequency, superimposed on the applied tone, will be audible.

A supply of about 20 or 30 volts of A.C., periodicity 50 to 100 cycles, is suitable for the purpose of testing; it may not be obvious to users of A.C. sets that voltages of this order are usually available in their own receivers.

Most mains transformers have a primary winding tapped for various intermediate voltages between 200 and 250 volts, and in these windings we have just what is needed. To make a test, the loud speaker output transformer may be disconnected from its usual position in the circuit and joined across the power-transformer windings in the manner shown in Fig. 25. The position of the output-transformer connections depends on the power required to vibrate the loud speaker diaphragm at reasonable am-

plitudes for testing. Care must be taken not to apply too much voltage, and, most important of all, not to impose a short-circuit on the mains supply.

While tests are being carried out the leads originally connected to the output-transformer primary may be joined together in order to maintain a sensibly constant load on the H.T. power supply system of the receiver, and thus to prevent damage to condensers, etc.

It is hardly to be generally recommended that the amateur should himself undertake the somewhat ticklish operation of re-centring the moving coil if the service department of the makers is available for doing it for him. Patience and a light touch are generally needed, and the work can best be done while the loud speaker diaphragm is being actuated by the stepped-down mains voltage. The fact that the rubbing contact has been removed is shown by the disappearance of the secondary audible frequency.

### Ornamental, but—

Apparently unimportant details often exercise a marked effect upon the results obtainable from a receiver, and a case in point is the silk backing to the loud speaker fret. This silk is often secured by being glued around the edge of the hole only, and is not fixed to the cross-strips of the fret.

Now the cone of a moving-coil loud speaker develops a considerable amplitude of movement at low frequencies, and, in fact, it will often move visibly when a low note is applied suddenly, as when a drum is beaten. Such a large movement of the cone means that a large volume of air is displaced, and this movement of the air carries with it the silk backing to the fret.

In itself a movement of the silk causes little harm, but it will often be found that in its forward movement it is brought up with a jerk against the fretwork, and causes an audible rattle.

The remedy, of course, is to glue the silk firmly to every portion of the woodwork with which it can come into contact, so that this trouble cannot occur.

### Class "B" Output Unit

Although the components associated with a Class "B" output stage do not take up very much space, it is not always possible to find room for them in an existing set of fairly compact design. In such circumstances the obvious

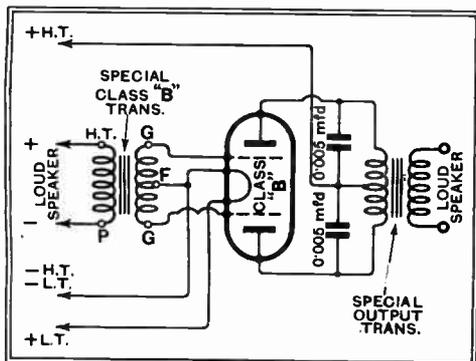


Fig. 26.—An "add-on" Class "B" unit, showing connections to existing receiver.

thing to do is to mount the extra components in a separate container which will be treated as an external adjunct to the receiver. As a rule the original output valve will

be converted into a driver valve; it will generally be possible to economise in anode currents by over-biasing the grid of this valve.

As will be seen from Fig. 26, which shows such an "add-on" unit, the internal wiring and also the interconnections to the existing receiver are quite simple. Little or no alterations to the set itself will be required, although some form of tone control must be provided in order to prevent over-accentuation of high notes. This control could be embodied in the Class "B" unit, but it is perhaps more usual to include it in an earlier stage. As a rule, the simple plan of shunting the primary of the existing L.F. transformer with a condenser of 0.01 mfd. in series with a variable resistance of 20,000 ohms or so will be found satisfactory.

In addition, if there are any signs of instability, or if quality is poor, it may be necessary to provide extra decoupling in the set. Occasionally this decoupling will be desirable in the driver circuit.

### H.F. Energy in Speaker Leads

If the loud speaker is connected to the set by long leads various minor troubles, from which the set is quite free when short leads are used, are given a chance to develop.

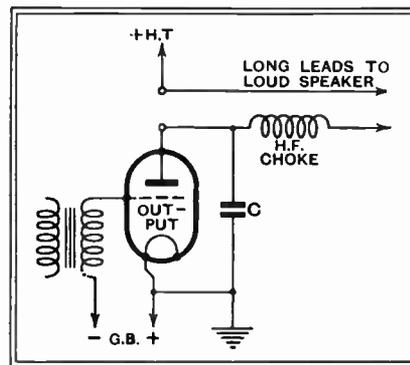


Fig. 27.—Connections of an H.F. filter in the loud speaker leads.

If, for example, high-frequency currents are slipping past the detector valve into the L.F. amplifier, there may be a tendency to instability and self-oscillation. In a less bad case, the fact that the loud speaker leads are "live" may bring about "threshold howl," which manifests itself as a squeak or grunt, momentary or continuous, when the set is on the verge of oscillation. Such phenomena as these are due to radiation of the high-frequency currents from the speaker leads back to the aerial.

Besides radiating, long leads may also act as collectors of energy, or, if only a poor earth is available, as a counterpoise. In either of these cases the result may be that hum or other noises (from vacuum-cleaners and such-like disturbers of the peace) is picked up from nearby electric light wiring.

If the leads are radiating, a certain cure can be found in the use of a high-frequency choke, as shown in Fig. 27, backed up if necessary by a condenser C of capacity about 0.001 mfd. For leads that are acting as collectors of unwanted energy (a less usual case), the same cure will be effective provided that the earth connection is a fairly good one. With a poor earth a choke may be required in *each* loud speaker lead, and the best disposition of the condenser, if one is needed, will have to be found by experiment.

## Loud Speaker Baffle

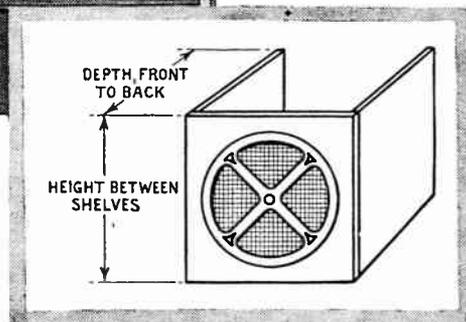
A baffle must be of large area if low notes are to be properly reproduced—it must be so large, in fact, that it can hardly have a place in a tastefully furnished room, unless it be disguised in some way or other.

Many disguises for a baffle have been put forward from time to time, ranging from a fire-screen to a table with a hole cut out of the centre. The former is a purely ornamental device, for any great heat would ruin the loud speaker diaphragm, while the latter method involves spoiling the table. Few, if any, of these suggested disguises have possessed both the desirable qualities of large area and rigidity. But a bookcase may easily be adapted to act as a baffle without being spoilt either in appearance or utility. Furthermore, when filled with books it is acoustically "dead," and many people possess one which is amply large enough to fulfil the requirements as regards size and spacing between shelves. This form of baffle has an outstanding advantage over other types in that no alterations, beyond the removal of half a dozen or so books, have to be made to the existing scheme of furnishing and decoration; nothing new has to be given a place in the room.

The scheme is simplicity itself, and a glance at the accompanying sketches should make it perfectly clear. By means of a U-shaped framework, a small chamber is made between two shelves, and in this chamber the loud speaker is mounted, exactly as in a larger cabinet. The front of the chamber is, of course, in the form of a grille to permit the egress of sound-waves, and for a similar reason the back of the bookcase must be cut away behind the loud speaker chamber. Beyond this the bookcase will not need any permanent alteration, and, indeed, the piece cut away may be replaced at any time should it be desired to do so, although its absence will not be noticeable behind a row of books.



Fig. 28.—An open bookcase makes an almost perfect loud-speaker baffle.



The joints between the chamber and the shelves and back must naturally be made sound-proof, and it is essential that the bookcase should stand an inch or so clear of the wall. In the majority of cases the wainscot ensures adequate spacing.

It will hardly be necessary to add that the scheme works at its best with an open bookcase; where glass doors are fitted, these must be opened for listening.

The small amount of carpentry involved in carrying out the necessary additions and alterations should present no difficulties. Naturally, no definite dimensions can be given for the framework, as bookcases do not run to standard sizes.

## Rectified Field Current

One of the simplest and cheapest methods of rectifying A.C. current for supplying the field of a moving-coil loud speaker is that shown in Fig. 29. The diagram is almost self-explanatory, but it should be emphasised that it is

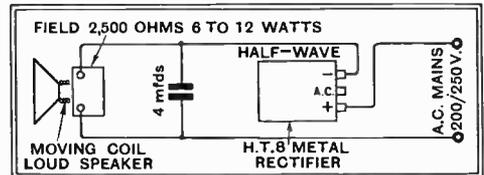


Fig. 29.—Simple rectifier for supplying energising current to a high-resistance speaker field winding.

virtually essential that the principle of hum neutralising (hum bucking) should be embodied in the loud speaker.

It will usually be convenient to wire the rectifier circuit across the "dead" side of the on-off switch of the receiver,

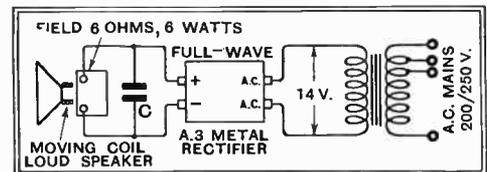


Fig. 30.—Another system of rectification for a low-resistance speaker field.

so that the current may be supplied automatically when needed. If this plan be adopted it should not be forgotten that heavier main fuses will be required.

The arrangement shown is applicable to the field windings having the almost standardised resistance of 2,500 ohms; where it is desired to feed the field winding of the older type, which was originally designed for connection to a 6-volt accumulator, the method suggested in Fig. 30 will be found satisfactory. Due to the fact that the voltage required is low, it will be necessary in this case to interpose a step-down transformer between the mains and the metal rectifier.

One of the advantages of working with a low rectified voltage is that a high-capacity dry electrolytic condenser may be used in the position marked C for the purpose of smoothing the output from the rectifier.

## Loud Speaker Volume

There is sometimes a tendency, when choosing a loud speaker, to give great thought to such considerations as frequency characteristics, suitability of the field winding (if any), the output transformer, etc., and to ignore entirely the question of the power-handling capabilities of the instrument.

Some of the smaller speakers are intended by their designers to deal with an input of only 3 watts or so of audio-frequency energy; used with, say, a 6-watt valve, such a loud speaker is anything but satisfactory, and it will be found that full advantage cannot be taken of the output of the valve.

Those who use batteries, or even low-power mains-driven sets, should also bear in mind the question of sensitivity, which is always mentioned in our test reports. An efficient loud speaker operated in conjunction with, say, a 500-milliwatt valve is just as satisfactory as another instrument of equally good characteristics but half the sensitivity, working with a valve giving 1,000 milliwatts.

### Choke-filter Outputs

It will be fairly obvious that a loud speaker feed condenser, working in conjunction with a choke-filter output system, is called upon to withstand the full D.C. voltage that is applied to the anode of the output valve when the conventional method of connection, as shown in Fig. 31 (a) is employed. Consequently, a relatively expensive high-voltage condenser must normally be chosen for this position in a modern high-power output stage. Superimposed upon the D.C. voltage there are also the amplified speech-frequency voltages built up across the choke, and so it will be seen that the feed condenser has no easy task.

The method of connection in question has the important advantage that the anode circuit is to a great extent "decoupled" when the loud speaker is fed in this way; signal frequency impulses are largely deflected from the source of H.T. supply by the action of the choke.

When the extra decoupling afforded by "earthing" the loud speaker is not necessary, the output circuit may be rearranged as in Fig. 31 (b). Here the choke-filter output does not contribute anything towards decoupling the H.T.

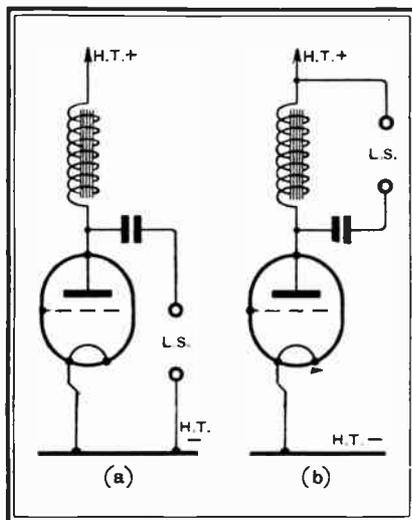


Fig. 31.—Alternative loud speaker connections.

feed circuits, but practically no D.C. voltage is applied to the condenser, which may accordingly be of the low-voltage type.

This is an argument in favour of arranging a pentode output circuit with a centre-tapped choke as in Fig. 31 (b), with the low-potential end of the loud speaker joined to H.T. plus instead of to earth. In this particular case

the loss of decoupling, as compared with the alternative scheme, is in any case negligible. Of course, an extra condenser may be inserted in the second connection to the loud speaker, in order to isolate the instrument from D.C. voltages, but by doing this the advantage of economy is lost.

### Really Free Bias

It is quite well known that it is possible to obtain free bias in the case of a mains receiver by the simple expedient of inserting the field winding of a moving-coil loud speaker in the negative output lead from the rectifier, rather than in its more usual position in the positive lead. It would, perhaps, be as well to emphasise the fact that a bias system operating in this manner is not so fully self-compensating as the usual "cathode resistor" method, and there is, therefore, rather more need to take care that the output valve is never seriously under-biased, or, worse still, operated without any negative bias at all.

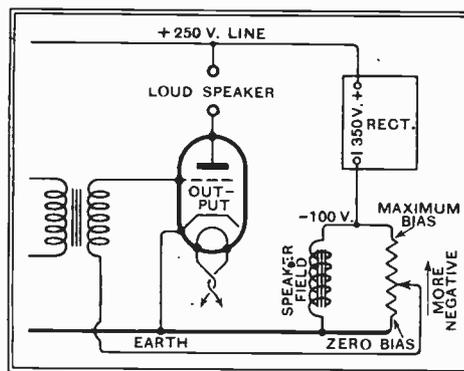


Fig. 32.—Automatic bias circuit in which negative grid voltage is "picked off" a potentiometer shunted across the loud speaker field winding.

This latter possibility is avoided if one realises how the volts are distributed in the circuit. As a rule, the required amount of negative bias is picked up from a potentiometer of 100,000 ohms or so, shunted across the speaker field, as shown in Fig. 32. The rule to remember here is that the slider of this potentiometer must never be allowed to approach too closely to the end of the resistance element marked "zero bias." This end is that which is always connected to the earth line of the receiver.

The diagram has been prepared on the assumption that the rectifier on normal load gives an output of 350 volts, and that 100 volts are dissipated in the speaker field.

Taking these figures and assuming that a bias of 25 volts is required for the output valve, the correct position for the slider would be at such a point that one-quarter of the total resistance is included between its point of contact and the point marked "zero bias."

### Position of the Output Transformer

Almost every moving-coil loud speaker sold nowadays embodies an output transformer as a part of the instrument; usually it is screwed to an extension of the cradle which supports the cone.

This is both convenient and practical, but, as has already been pointed out, it is not of necessity the best position for the transformer in every case. If, for example, set and loud speaker are installed in different rooms, it

may be well worth while to go to the trouble of dismantling the transformer, refitting it in the receiver chassis, and connecting the extension leads from the secondary terminals, as shown in Fig. 33 (a), directly to the speech coil of the distant loud speaker.

It seems that the benefits—and also the possible disad-

The ordinary method of connecting a loud speaker with the output transformer at the remote end is shown in Fig. 33 (b). This has all the disadvantages previously suggested, but, as it is in effect a high-impedance transmission line, ohmic resistance is of little importance, and so the finest wire that is sufficiently strong mechanically may be used. Insulation is, of course, important with this system.

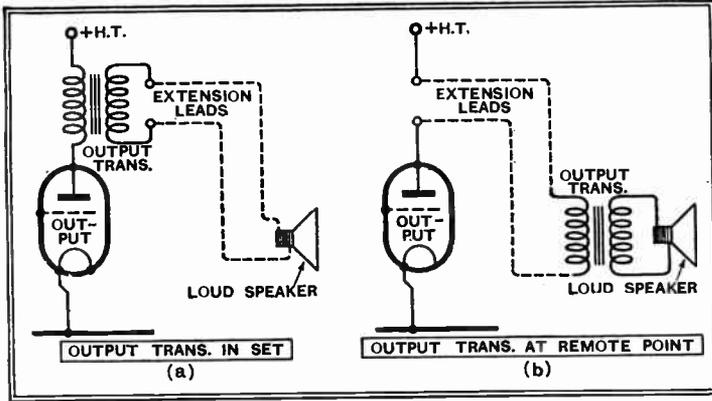


Fig. 33.—Alternative positions for the output transformer.

vantages—likely to accrue from this alteration are not fully appreciated. The most important gain is that any amount of capacity that is likely to exist in the extension leads will do no harm. Secondly, the leads are entirely isolated from the source of H.T. supply, and so there is no possibility whatever of doing harm through a short-circuit to earth. Lastly, the risk of hum being produced by induced voltages from badly installed lighting circuits, etc., is greatly reduced. Almost the only disadvantage is that the ohmic resistance of the extension leads must be low in proportion to that of the speech coil of the loud speaker.

Almost everyone knows by now that the anode current consumed by a Class "B" or Q.P.P. output stage depends on the extent of modulation of the incoming carrier wave. During programme intervals, when modulation is not taking place, current is almost negligible. Although it is a natural corollary of the foregoing, it does not seem to be always appreciated that anode current consumption is also influenced by signal strength; by "turning down the wick" the amount of H.T. energy consumed for reproduction of a given programme will be much less than when it is reproduced at full blast. In a fairly modern set the economy effected by reducing signal strength will be two-fold, as with a variable-mu H.F. stage the current of this valve will also be reduced.

When utmost economy is needed, provision might also be made for simultaneously applying rather more negative bias to the driver valve as well when volume is reduced. From the point of view of quality this would be quite permissible, as with artificially weakened signals less than the maximum output is needed from this valve. Perhaps, however, this is carrying economy too far, as the saving would be small, and hardly worth while.

## Volume & Current Consumption

## Miscellaneous

**Keeping a record of anode currents.—Internal adjustments to semi-variable condensers.—Devices for improving selectivity.—Special precautions for D.C. mains users.—Modified connections for non-standard aerials**

### Wiring Hints

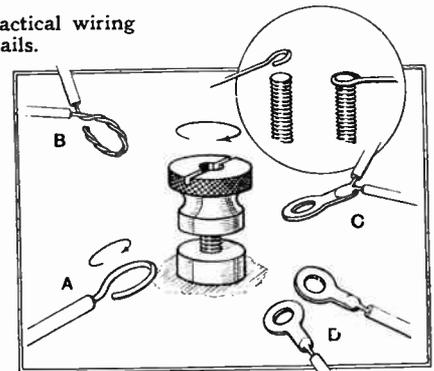
THERE is a right and a wrong way of carrying out even the simple operation of bending a wire loop which is ultimately to be placed under a terminal or screw head, and a surprising large number of constructors choose the wrong way. Actually, the loop should always be bent as shown at A in Fig. 34; as the terminal head is tightened, the loop will then tend to wrap itself more closely round the shank. When bent in the opposite direction to that of rotation, it will tend to open out. This is a detail of some little importance when the terminals are of small size.

Other examples of mechanical unsoundness are seen where several wires are connected to a single small terminal. A good and dependable connection of this kind can seldom be made by bending each wire into a separate loop, and it is advisable, when dealing with fine wire, to twist the wires together before bending them (see B in the drawing). Still better connections may be made by soldering both the leads to a single tag (C), or by using separate tags (D).

In the "portable" class, the amateur should certainly

be influenced to an even greater extent by the soundness of connections, as the sets must obviously be capable of withstanding rough handling and vibration. When a solid wire

Fig. 34.—Practical wiring details.



connection is to be soldered to the end of a pin or terminal shank, what is probably the best type of joint is illustrated in the inset of Fig. 34. The wire is bent into a loop of a

diameter a shade less than that of the shank, over which it is forced by pressure of the soldering iron. This simple joint is strong and very easy to make.

## Modern Constructional Methods

Among a certain section of wireless amateurs there is an understandable prejudice against the modern practice of securing components in position merely by means of their connecting wires, with no other form of mechanical support. It is argued that this method of construction is slipshod, unworkmanlike, and, more serious still, is open to technical objections on the grounds of permanence. In a receiver with single-dial tuning, it is obviously necessary that everything should be sufficiently rigid to prevent appreciable changes in stray capacity.

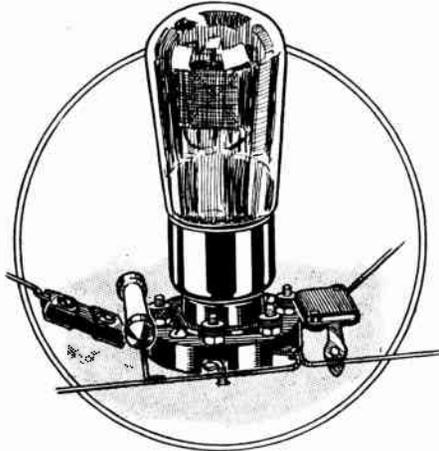


Fig. 35.—Components supported by their own connecting wires.

When one comes to examine the matter more closely, and from a strictly practical point of view, it seems quite certain that these objections are almost baseless. Given reasonable care and the exercise of common sense, there is no valid objection to anchoring light-weight parts such as resistances and fixed condensers by their connecting leads; in some cases a definite reduction in stray capacity will result, and so the waverange covered by the set will be increased. For instance, it is not always realised that a detector grid-condenser of the flat type, when screwed to a metal chassis or baseplate, may add many micro-microfarads to the tuned circuit with which it is associated.

On the score of permanence, a careful test shows that the greatest mechanical displacement likely to occur in a properly constructed set will bring about a negligible change in capacity; so little, indeed, that it would only assume any importance in such an instrument as a wave-meter.

There is, of course, a limit to the weight of components that may be suspended by their leads, but anyone blessed with the mechanical sense will realise when this limit is approached.

## An Invaluable Record

As soon as a new set, whether home- or factory-built, is finally installed and working satisfactorily, it is an excellent plan to measure the individual anode currents of the valves, as well as the current passing in each screen-grid circuit, if a sufficiently sensitive meter be available. These measurements should be recorded on a piece of paper, which may be pasted inside the receiver, or, at any rate, stored somewhere where it is unlikely to be lost.

Should a fault develop at any time in the future, it will then be possible to determine, with much less uncertainty than usual, whether it is due to the valves or the power supply equipment. Similarly, the inevitable gradual decline in valve emission may be watched, and it will be possible to know exactly which valve is due for replacement. A useful opinion can also be formed as to whether the power rectifier output has fallen off; in some cases the current of one valve will be found to have declined considerably, while that of all the others has actually increased during use. This is a certain indication that the valve which shows a low current reading is either defective or has excessive resistance in its anode circuit, and, further, that no suspicion need be attached to the anode-current supply system.

## Semi-variable Condensers

Semi-variable condensers of the compression type are widely used for a number of purposes; not the least of the reasons for their popularity is their cheapness. As they cost but little more than a fixed condenser of the same capacity, they may often be used in place of one of these components in cases where the use of a variable capacity is likely to confer the slightest advantage. But experience shows that compression condensers are not always used to the best advantage, possibly because amateurs do not understand fully the principles on which they are made.

All semi-variable condensers of the type under discussion are constructed on similar lines. Essentially they consist of a series of springy metal plates, interleaved with mica sheets. The metal vanes are bent in such a way that when the adjusting screw is slacked off they spring apart to the maximum possible extent, and so capacity is at a minimum. When the screw is turned in a clockwise direction it forces both vanes—or both sets of vanes—into closer contact, and thus capacity is progressively increased.

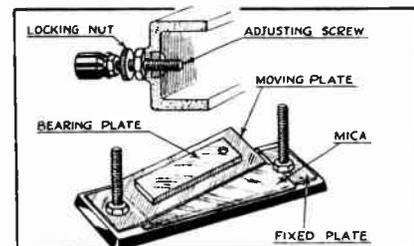


Fig. 36.—Constructional details of a typical compression type condenser.

It will at once be obvious that such a construction must inevitably result in a fairly high minimum capacity. This point should always be remembered, and it is useless to expect, for example, that a 0.0005 mfd. compression condenser will tune a given coil through as wide a range of wavelengths as a condenser of the air-dielectric type. All makers give figures for minimum, as well as for maximum, capacities, and both should be borne in mind when making a choice.

Another point to remember is that each turn of the adjusting screw does not produce the same change in capacity, or anything like it. In fact, the majority of the capacity change takes place during the last couple of turns of the screw. Obviously, one must not conclude that something is wrong if "nothing happens" until the screw is quite near the end of its travel in the threaded guide.

Although compression condensers are hardly at their best when used for tuning purposes in circuits where adjustment

is critical, it is often convenient to use them for such purposes. In such cases there is a possibility that on tightening the locking nut after making the adjustment, the screw, even if it is not turned accidentally, may be raised in its thread to a small extent, which may be sufficient to upset tuning.

Phosphor bronze, or very hard brass, is the material used in the best condensers; others, with vanes of comparatively soft brass, may tend after prolonged use to have a higher minimum capacity than the initial value. This is due to the fact that the plates do not separate to their full extent, and matters can often be put right temporarily by rebending them.

### Home-made Potentiometers

A moulded resistance of the carbon or composition type may in many circumstances be used quite successfully as a potentiometer, especially if critical adjustment is not needed.

In a resistance of this type, the conductive material is equally distributed, and, if care be taken, it is possible to pick up a voltage from any point along the length of the resistance rod. Before attempting to do so, it is, of course, necessary to remove the protective coating of enamel and to scrape the rod quite clean.

The only difficulty likely to be encountered is in making a sufficiently intimate contact with the resistance element; a light single-point contact is certain to have a high resistance.

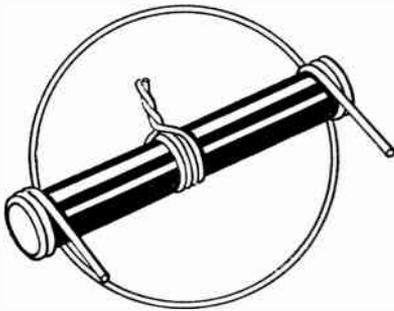


Fig. 37.—Tapped potentiometer connection on a moulded resistor.

A fairly satisfactory method is illustrated in the accompanying sketch; here the rod is wrapped with two or three turns of tinned copper wire. A more satisfactory and more easily adjustable connection can be made with a light circular metal clip fitted with a tightening screw; the inside surface of the clip may with advantage be "tinned" with

a thin layer of solder, or a strip of tinfoil may be used.

A practical use for a potentiometer of this type is in regulating the screening grid voltage of an H.F. valve.

### H.T. Booster Battery

Battery users are now paying greater attention to the efficiency of their receivers, and particularly to quality of reproduction. But there is one point that seems to be generally neglected: it is not always realised that there will be a gradual falling-off in the voltage of a dry-cell H.T. battery. The purpose of this note is to stress the desirability of buying a battery of rather higher initial voltage than is needed, or, alternatively, of obtaining a "booster" battery after the main battery has been in use for a few weeks.

The latter plan is perhaps the best and most economical, as the auxiliary cells, which will eventually be used as a supplementary source of voltage, may deteriorate slightly before occasion arises to put them into service. A 50-volt battery will be suitable in most cases, and it is not essential that it should have quite as high a capacity as that of the main battery. Perhaps this question of capacity is not

of great importance, but a fairly good case can be made out for the use of the next smaller size of cell.

All battery valves are now rated to work at 150 volts, and so those who are desirous of obtaining the maximum sensitivity and volume will normally start with a 100-cell battery, which gives approximately that initial voltage. After fifty or sixty working hours the voltage of such a battery will probably fall to 1.25 volt per cell, or a total of 125 volts; at this juncture 25 volts from the "booster" battery may be added in series. As the modern H.T. cell maintains its voltage at roughly 1.25 volts for a considerable period, it is unlikely that any further addition will be necessary for some considerable time. After, perhaps, a total of 150 working hours it may be necessary to add the remaining 25 volts of the auxiliary battery in order to restore pressure to the original value of 150 volts.

This method of boosting would have been condemned at one time, as a falling-off in battery voltage is always accompanied by an increase in internal resistance. But nowadays, thanks to the general use of decoupling, a fairly high internal resistance may be tolerated.

### Possibility of Repairs

Repairs to the windings of a defective L.F. transformer are usually beyond the scope of the amateur, and if the manufacturer is unable to put matters right, the component must usually be scrapped. But before discarding it, it is always worth while to remove the external protecting shroud, and to make sure that the fault is not due to a defective connection between the leading-out wires and the inner ends of the terminals. Such faults are by no means uncommon, and they are usually quite easy to repair. It is also worth while to examine the joint between the heavy leading-out wire and the finer wire of the winding proper.

### Auto-transformer Couplings

There must be many sets using manufactured coils of the standard type (tuning coil, with tapping or separate primary winding for aerial, and also a reaction winding) as the tuned-anode coil of an H.F. valve, reaction being applied from the detector anode circuit.

Here, ready to hand, is a means of increasing selectivity with these coils. Instead of using the whole coil in the anode circuit, connect the anode of the H.F. valve to the terminal marked "Aerial" of the coil (as in Fig. 38). The

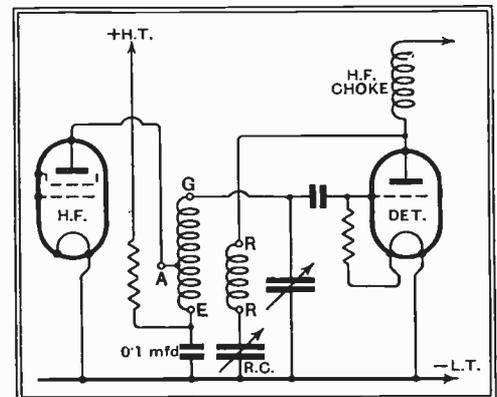


Fig. 38.—"Tapped-down" connection on a tuned-anode H.F. coupling coil.

method thus applied is identical to that universally used to obtain selectivity between the aerial and input tuning circuit. The result will be an enormous increase in selec-

tivity, accompanied by a relatively small drop in signal strength.

What happens is briefly this: The anode circuit impedance is reduced considerably, giving a lessened oscillatory p.d. across its portion of the coil. The tuned circuit is more or less loosely coupled to this coil. The fact of loose coupling has, however, reduced the damping effect of the preceding valve in proportion to the turns ratio. Thus the reduction in applied volts is to some extent compensated for by an increase in current, since current in a resonant circuit depends on the damping present. On the other hand, selectivity is gained, both due to the reduction in damping of the tuned circuit and to the loose coupling.

## Improving True Selectivity

There is no easier or more certain way of improving the selectivity of an existing set than by adding an extra tuned aerial circuit. Of course, this addition is only applicable to sets in which the existing input circuit is of the single-tuned variety.

It would appear that the great majority of failures to obtain satisfactory results from this addition are due to the fact that provision is not made for sufficiently loose coupling between the added circuit and the existing input circuit of the set. It is sometimes rather difficult to determine exactly whether the coupling is loose enough or not; in cases of uncertainty it is wise not to be satisfied unless it is possible to loosen coupling to such an extent that an easily perceptible reduction in signal strength can be brought by setting the coupling at minimum.

## Increasing Detector Output

In a well-designed modern receiver matters are usually so arranged that the undistorted output of the detector valve is just sufficient fully to load the succeeding valve—which, more often than not, is the output valve.

It will therefore be obvious that substitution of another type of output valve, with a greater power rating, may well fail to have the desired results. The reason, of course, is that the detector output remains unchanged, or, alternatively, if an increase can be obtained, it will not be free from distortion. Consequently, advantage cannot be taken of the increased power output of the new valve, as it will be impossible to load it properly.

A simple solution of this problem is occasionally to be found in a reduction in value of the detector feed resistance. By arranging to pass a few extra milliamperes in the anode circuit of this valve power output will be sensibly increased—but at the expense of valve life if matters are carried too far. Another possible objection is that the decoupling resistance will probably become ineffective for its primary purpose if it is reduced to such a low value that it is not considerably greater than the reactance of the decoupling condenser at low frequencies.

## The Superheterodyne Oscillator

Considering the relatively large number of tuned circuits in the average superheterodyne, it is surprising that in most cases this class of receiver can be persuaded to function in an entirely satisfactory manner with a minimum of difficulty. The few difficulties that arise are, more often than not, associated with the oscillator valve or its circuits, and when results are not up to expectations time may often be saved by devoting attention to this part of the set before looking elsewhere for the trouble.

Everyone knows that a superheterodyne receiver cannot work properly unless the valve in question is generating

oscillations. But it is not so generally appreciated that results may be poor, at any rate over a section of the tuning scale, if it is oscillating too fiercely. This state of affairs is generally due to excessively tight coupling between plate and grid circuits, and it will sometimes manifest itself as a buzzing sound, audible in the loud speaker at certain settings of the tuning condenser.

When results are for any reason unsatisfactory, and particularly when the effect mentioned in the previous paragraph is noticed, it is worth while to assure oneself that the reaction winding of the oscillator coil assembly has not become displaced. This coil is sometimes wound on a small former, which is mounted inside the main former on which the grid and plate coils are supported. Even if buzzing does not take place, it is possible that general results may be improved by a slight alteration in the position of the coil; it must not, however, be moved to such an extent that self-oscillation ceases entirely at one end of the tuning scale.

## Makeshift Aerials

Where it is difficult to erect an efficient outdoor aerial, and particularly in cases where long-distance reception is not an essential requirement, it should be remembered that the wiring of an electric bell system often makes a surprisingly effective collector of energy.

The word "often" is used advisedly; like most other extemporised aerials, the efficiency of this particular form is likely to be a varying quantity, for reasons that are not generally apparent. But, at the worst, no harm will be done by trying it, as nothing more is required than a connection, through a small semi-variable condenser, between the nearest point on the wiring (generally a bell-push) and the aerial terminal.

## Superheterodyne I.F. Transformers

Before finally mounting in position the I.F. transformers of a superheterodyne receiver, it is wise to examine the simple mechanism provided for adjustment of the built-in trimming condensers which are shunted across the windings. The capacity of these condensers is usually varied by means of levers which project sufficiently far for their ends to be accessible, or, alternatively, by extension rods, through which a screw or nut is rotated.

There should be no doubt that operation of the control actually causes the position of the moving plate or plates to be altered.

## Estimating Intermediate Frequency

Second-channel interference, which manifests itself by a tunable heterodyne whistle of a similar nature to that ordinarily associated with instability, is almost the sole remaining drawback of the superheterodyne. In any case, the trouble is not a very serious one, and is usually encountered only in the immediate vicinity of a station.

It is fortunate that the phenomenon of second-channel interference can be turned to good account in affording a rough-and-ready means of estimating the value of the frequency to which the I.F. amplifier is actually tuned, without the use of instruments.

Having identified the distant station upon whose wavelength the interference occurs, the frequency of this transmission should first be ascertained. This figure is then subtracted from the frequency of the local station which causes the interference, and the result is then divided by two. This will give the intermediate frequency within about 5 kilocycles.

## Comparing Aerials

The design of indoor aerials is not a subject capable of accurate treatment, and most experimenters probably decide finally upon a particular aerial after trial-and-error tests carried out in an empirical manner. The system of aerial comparison described in this note should prove helpful in such experiments.

The apparatus required consists only of a semi-variable series aerial condenser and a volume control, both of which components will possibly be in the set used for the tests. If not, they may be connected as shown in Fig. 39.

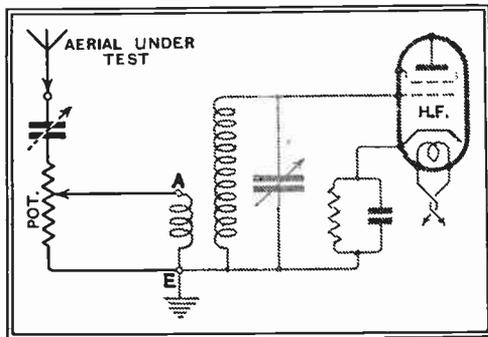


Fig. 39.—Making comparative measurements of aerial efficiency.

The procedure is as follows: First, connect an aerial to the set through the condenser, and adjust it for optimum signal strength, tuning the set very carefully. Then reduce the volume control until inaudibility is just reached. Note the volume control setting, which will give an indirect and reciprocal indication of aerial efficiency.

The comparisons should be made at a number of wavelengths, and items such as speech or a tuning note should be selected in order to ensure a reasonably constant input. Further, the comparisons should be carried out during a short period of settled atmospheric conditions, preferably in broad daylight.

## D.C. Mains Precautions

It is a sound plan to make it a rule always to include a fixed condenser in the aerial circuit (i.e., between the aerial and the input tuning coil) of any D.C. receiver. A mica dielectric condenser is suitable, and if it has a capacity of 0.002 mfd. or larger its inclusion will not affect the functioning of the receiver or the alignment of the ganged tuning system.

A condenser in this position will prevent the possibility of harm being done should the aerial be blown down during a storm, and, particularly in the case of positively earthed mains, it will remove the risk of shock to anyone who touches the aerial wire. The aerial condenser is, of course, an addition to the usual high-capacity condenser through which a D.C. set is normally earthed.

It is almost inevitable that much of the metal-work of a D.C. mains receiver should be "live," consequently the cautious constructor of a set of this type will always take care to see that proper protection against shock is afforded by the cabinet. In many cases the spindles of control devices—not excluding tuning condensers—will be at a relatively high voltage with respect to earth, and so with respect to the hand of the user. It is therefore worth while

to see that the grub screws which secure the control knobs to their spindles are deeply countersunk, so that there is no risk of making contact with them. If necessary, the screws may be reduced in length, but as a rule it is as well to make sure they are left with a sharp point which will bite into the metal of the spindle and so prevent slip.

## With Unconventional Aerials

Aerial-to-grid coupling coils are invariably designed on the assumption that they will be used in conjunction with a full-sized aerial. This means, in practice, that when the set in which such a coil is included is operated with a short inside aerial, coupling will be unduly weak, and signal strength will probably be weakened to an unnecessary extent; admittedly, apparent selectivity will at the same time be enhanced.

In such cases it is worth while to make provision for closer aerial coupling; if the coil be of the auto-transformer type, the aerial tap should be moved to a position more remote from its earthed end, while the same effect is obtained with a double-wound transformer by adding primary turns.

When an exceptionally short aerial is employed, it is almost always best to join the aerial, possibly through a small condenser, to the "grid" end of the winding.

Coils of a type that were originally intended for use in single-circuit tuners are sometimes used in band-pass filters, where closer aerial coupling can generally be tolerated, due to the high inherent selectivity of such devices. In this case the above suggestion may sometimes be carried out with good results, even though the aerial may be of full size.

## Reducing Frame Aerial Losses

A compact home-made portable set is often enclosed in an extemporised ready-made container—a suit-case, attaché case, or something similar—that was never intended by its makers for such a purpose. As often as not, the material of which these cases are made has deplorable dielectric properties, as can sometimes be proved by the fact that the set works much better when the frame aerial is withdrawn entirely from the container.

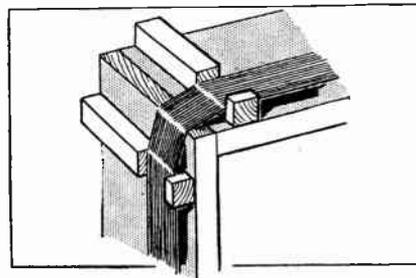


Fig. 40.—Providing air-spacing for a frame-aerial winding.

It is always a safe rule to allow a certain amount of air spacing between a frame-aerial winding and any solid material that may be likely to introduce losses. This spacing may easily be provided by making the usual wooden framework rather smaller than the inside dimensions of the case, and by fitting, as supports for the winding, a number of slotted battens, arranged as in the accompanying sketch. The battens may be about  $\frac{1}{2}$  in. square.

## Improvised Aerial Condenser

Much as we may dislike the idea, most of us are forced, at some time or another, to obtain selectivity, if only temporarily, by the expedient of inserting a small condenser in the aerial lead. Selectivity gained in this way is, of course, at the expense of range.

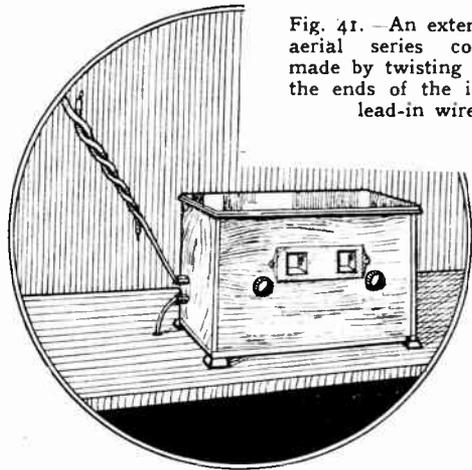


Fig. 41.—An extemporised aerial series condenser, made by twisting together the ends of the insulated lead-in wire.

Many readers are aware that a small condenser may be improvised from a length of twisted twin flex. Similarly, an aerial series condenser may be made in a moment by cutting the leading-in wire, if of the insulated type, and twisting together the two ends for a length of three or four inches, as shown in the accompanying illustration. The greater the area of overlap the higher is the capacity of the condenser formed by the two wires.

## Precious H.T. Volts

In dealing with A.C. mains receivers there is no especial need to be parsimonious in the matter of H.T. voltage, as a little extra pressure may always be obtained by increasing the step-up ratio of the power transformer, and, perhaps, changing the rectifier.

But when it comes to designing sets for D.C. supplies there is a very different story to tell. Here the supply voltage is inexorably fixed at the pressure of the mains, and it can only be increased by the use of a rotary converter or similar appliance. Indeed, the usual course adopted by those who require an exceptionally large output from their amplifiers is to use one of these machines.

For the benefit of those—and they form the great majority—who must limit themselves to the voltage of the supply system, it may be emphasised, therefore, that H.T. volts should be regarded as precious. Although one can hardly advocate battery bias nowadays for the general run of wireless users, there is no objection to a saving being effected in this direction by the knowledgeable wireless amateur, who will appreciate the need for occasional checking of the bias battery. Of course, the H.T. voltage is reduced by the amount of grid bias necessary when any "automatic" scheme is employed.

Another saving can often be effected by using a specially good smoothing choke of adequately high inductance, but with a low D.C. resistance. Chokes of this type are usually designed for high-power A.C. "quality" amplifiers; they are physically considerably bigger than the average types, and are also rather more costly.

The difficulty of obtaining enough detector anode voltage (for power-grid detection) can sometimes be overcome by using choke coupling, or by substituting a diode.

## Supplementary H.T. Battery

Those who have a low-voltage D.C. supply—in the order of 100 to 150 volts—are at a distinct disadvantage when designing a receiver to operate directly from the supply system. True, there is no particular difficulty about the filament or heater circuits, as modern indirectly heated D.C. valves of, say, the 16-volt type may be used in the conventional manner. But the question of H.T. voltage is something of a problem. Without any additional source of voltage, the supply to the anodes is obviously limited to something below the mains pressure, and anything less than 200 volts is hardly adequate for modern needs, at any rate when mains valves are to be used.

If an attempt is to be made to attain the best possible reception in adverse circumstances of this nature, it is to be recommended that, for the purpose of H.T. supply, the mains voltage should be supplemented by a battery; of course, dry cells could be employed, but this course is anything but economical, except, perhaps, in the matter of first cost, and it is a good plan to employ an H.T. accumulator battery, as the cells may readily be charged from the mains during the time that the set is out of use.

It will be convenient to fit a charge-discharge switch to the receiver itself, in order to avoid the need for disconnecting the cells each time that they are to be charged.

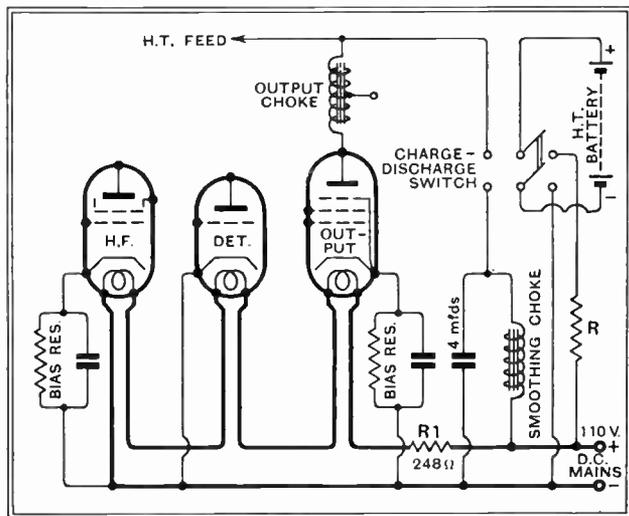


Fig. 42.—Skeleton circuit diagram of a D.C. mains set with a supplementary H.T. accumulator battery.

What is probably the best way of overcoming the handicap of a low-voltage D.C. supply is illustrated diagrammatically in Fig. 42. For purposes of explanation, it is assumed that the receiver is to be of the popular H.F. det.-L.F. three-valve type, with 16-volt indirectly heated D.C. valves, and that current is supplied at 110 volts. It will be seen that the heater and cathode circuits are entirely conventional, but that when the battery switch is in the left-hand position the voltage of the accumulator cells is added to that of the mains for supplying the various anode circuits.

The value of the limiting resistance  $R_1$  is calculated on the basis of the assumptions made above, and, of course,

will need modification if the mains voltage be changed, or if any alteration be made in the type or number of the valves.

It is impossible to assign a definite value to the resistance R, through which the cells are charged. The purpose of this resistance is to limit the charging current to the value recommended by the makers of the battery.

It should also be pointed out that the total voltage of the supplementary battery should be appreciably less than that of the mains, or the cells will never be fully charged; with a 110-volt supply the battery may contain from 40 to 45 cells.

## Valve Repairs

In spite of improvements in valve construction, it sometimes happens that the moulded base of a valve becomes loose, due to a failure of the cemented joint between the glass bulb and the cap. So far as electrical efficiency is concerned, this state of affairs does not necessarily imply that anything is wrong, but it is probable that, as a result of handling the valve, one or more of the leading-out wires which connect the internal electrodes to the pins will eventually be broken.

To reduce the possibility of this occurrence, a stout rubber band may be slipped over the lower end of the bulb in such a way as to embrace both bulb and cap, as indicated in the accompanying illustration. A one-inch section of bicycle-tyre tube is ideal for the purpose.



Fig. 43.—Securing a loose valve-base by means of a wide rubber band.

In the event of one of the leading-out wires being actually broken through looseness of the cap, it is quite possible for the amateur handyman to effect a satisfactory repair, although it cannot be denied that the operation calls for a fair measure of manual dexterity. The connecting wires are normally passed through the hollow external pins and soldered to their tips; these wires must obviously be unsoldered before the cap can be removed. It is just possible to do this operation with an ordinary soldering iron by applying pressure to the loose cap in the right direction, but it is much easier to heat the tips of all the pins simultaneously by placing them on a small sheet of copper or brass which is heated to the necessary temperature by means of a spirit lamp or blow-lamp placed underneath it.

While the cap is being removed, great care must be taken to identify the various leads, as their internal connections can seldom be traced by examination.

Having removed the cap, an extra length of wire is soldered on the broken connection, and to facilitate replacement the other connections should also be lengthened.

## Anode Voltage Unimportant

A quite unnecessary amount of thought and care is often devoted to the question of supplying exactly the maximum rated voltage for the anode of a screen-grid valve or a pentode in a mains-operated receiver. It may be worth while to remember that, in this type of valve, current is controlled almost entirely by the screening grid (or priming grid) voltage, and that, within reasonable limits, not the slightest harm will be done by applying a considerably greater pressure to the anode than that at which the valve is rated.

## Heater Circuit Wiring

When building a mains-operated receiver it is usual to take a good deal of care with the arrangement of connecting leads carrying "raw" A.C. current; the "go" and "return" leads are generally twisted together, and they are spaced as widely as possible from such danger points as detector-grid circuits, etc.

In dealing with D.C. mains sets it is sometimes forgotten that almost equal care should be taken, particularly with regard to the heater wiring and the mains leads connected to the on-off switch, at any rate, if this component be mounted on the front panel.

Electrostatic pick-up in the detector circuit—not forgetting the second detector of superheterodynes—should also be guarded against.

## A Point About A.V.C.

It is well known that the sensitivity of the average receiver tends to fall off as wavelength is increased; most receivers seem to work at their best at about 300 metres. As a result of fitting automatic volume control, there is generally an apparent levelling up of amplification, especially when the set has a fair reserve of sensitivity.

This effect is, of course, a spurious one, as A.V.C. can do nothing to increase the sensitivity of the top end of the waveband, nor should it reduce sensitivity at lower wavelengths. The aural impression that it does so seems to be due mainly to the fact that the overloading, which is normally produced by so many stations working in the neighbourhood of 300 metres, is no longer taking place.

When it is suspected that the receiver is behaving abnormally it is always wise, before making a test, to disconnect the A.V.C. valve, or to render the control inoperative in some other way.

## Judging Quality

Those of us who are not blessed with a good musical ear are often at a loss to say precisely in what respects our receivers are deficient in quality of reproduction; we may feel certain that something is lacking at the upper or lower end of the frequency scale, or that there is a marked resonance, but are unable to form clear-cut opinions as to the true nature of the imperfections of the set.

Now, it is useless to attempt a cure until the complaint is known, and, as an aid to diagnosis, it may be pointed out that, by listening critically at a considerable distance from the loud speaker, it is generally possible to form a useful opinion of the trouble, even without any special ability in this direction.

If dull reproduction is due to severe high-note loss it will be observed that, as distance between the instrument and the listener is gradually increased towards the limit of audibility, nothing but low-pitched and unintelligible sounds can be heard when speech is being transmitted. Conversely, a serious deficiency in bass response is equally easily detected in a similar way.

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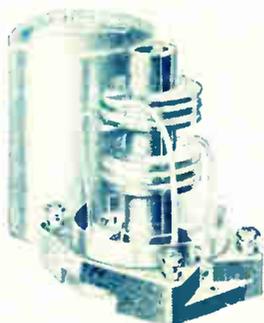
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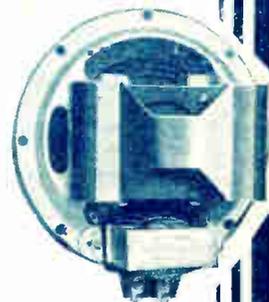
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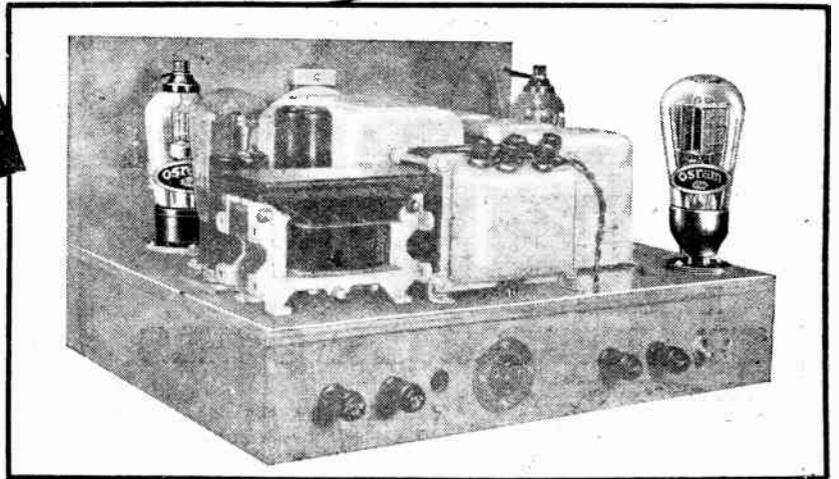
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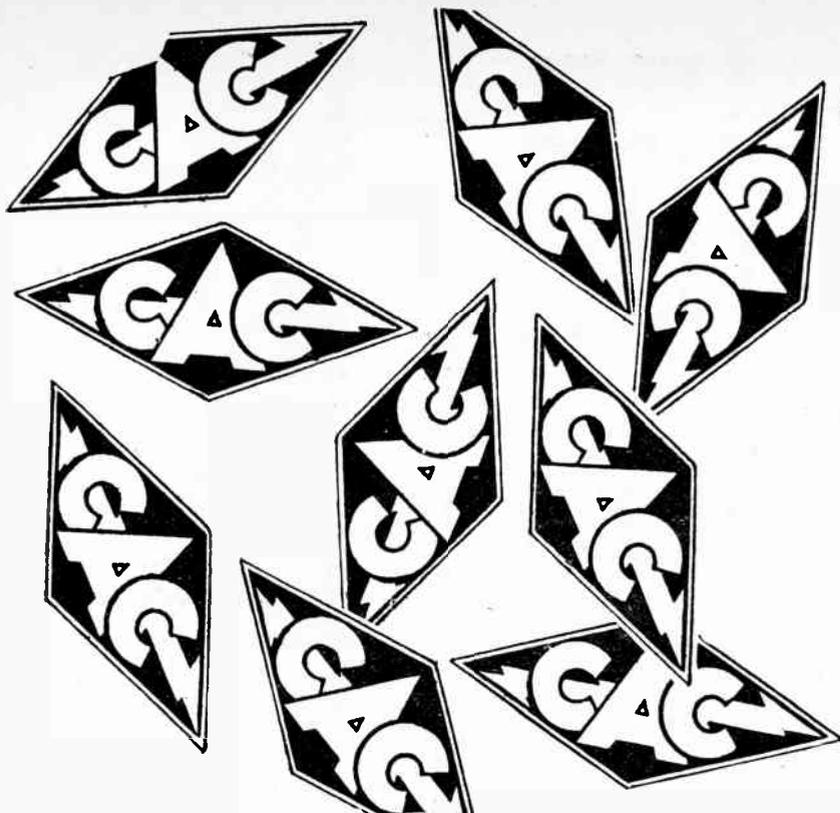
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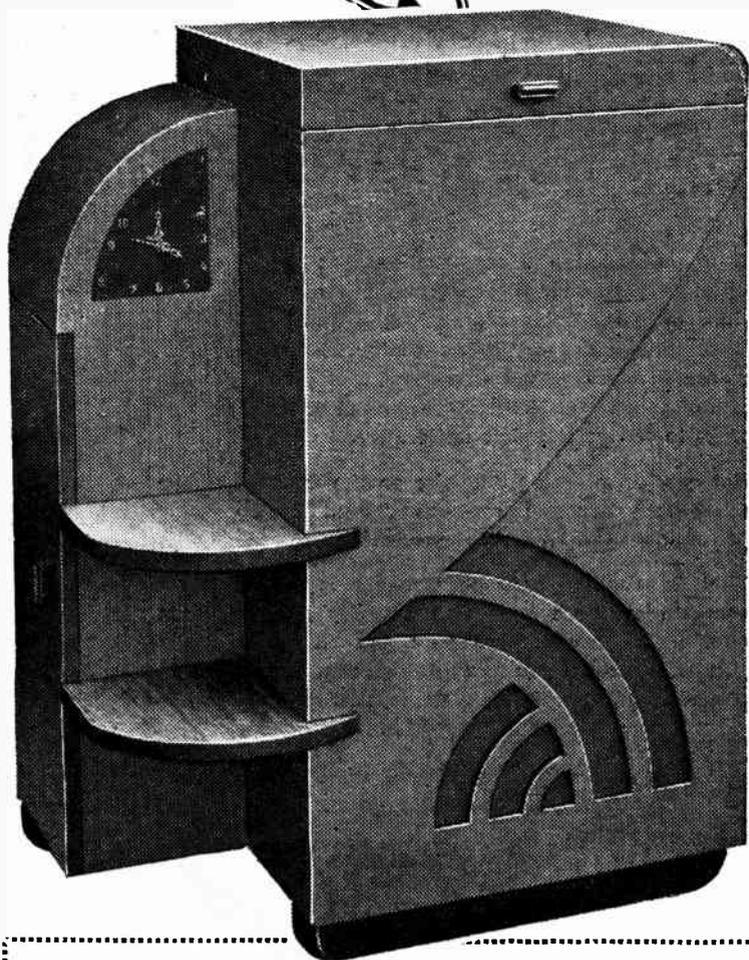
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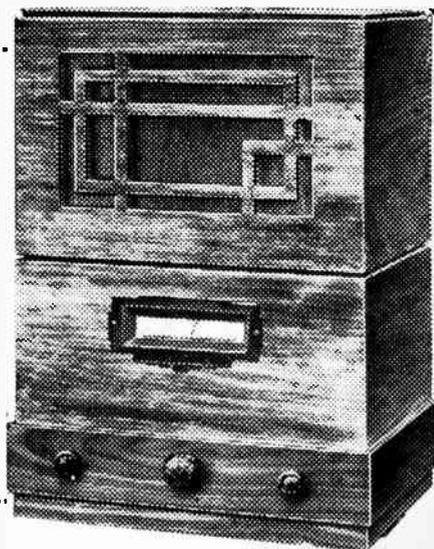
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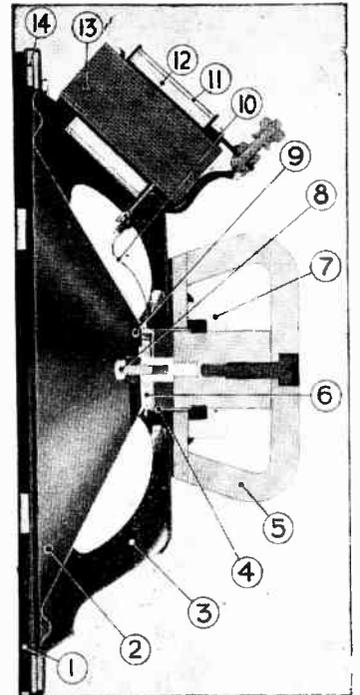
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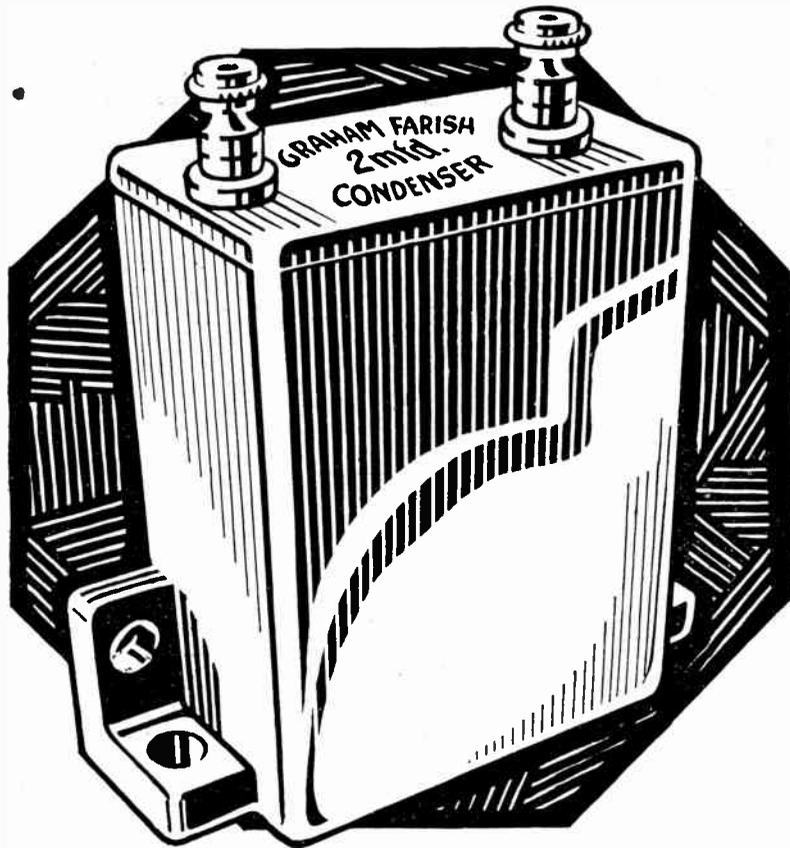
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Designed for years of good service. 500-volt test, 250-volt D.C. working. Insulation resistance, 5,000 megohms per mfd. Handsome Bakelite moulded case, providing both upright or flat mounting (Reg. design 723271), with large terminals. A handsome and extremely efficient component at a modest price.

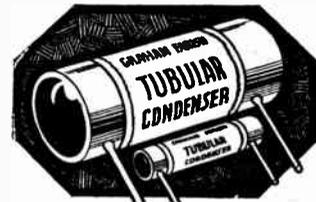
**1/6**

.25 mfd. 1/6  
.5 mfd. 1/9    1 mfd. 2/-    2 mfd. 3/-

**GRAHAM FARISH PRODUCTS**



Send a postcard for our new Catalogue which describes all our products.



**TUBULAR CONDENSERS**

Wire ends anchored by means of eyelets in tube, avoiding any strain on the insert. 250-volts working, 500-volts D.C. test. Very high insulation resistance, hermetically sealed, high quality bakelite tubes made in various sizes.

.0001 mfd. to .006 1/-  
.01 mfd. 1/3    .02 to 25 mfd 1/6



**FIXED CONDENSER**

In a complete range of capacities, upright or flat mounting. Every condenser is tested on 750 volts D.C. Capacities accurate within fine limits.

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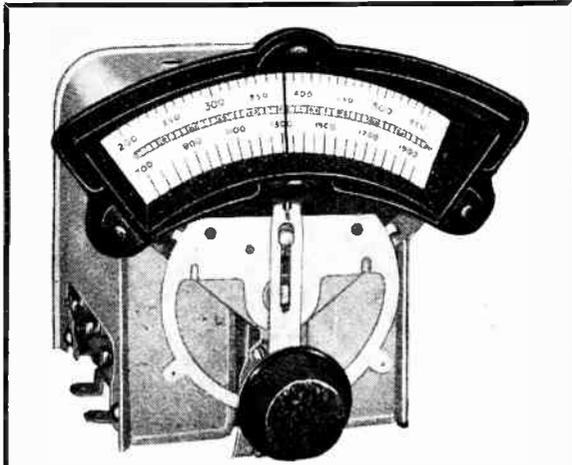
Ensure a safe and efficient Aerial and Earth. The new **AEROFICIENT KIT** provides all you need.

**6 6** Complete.

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Export Office : 11/12 Fenchurch St., E.C.3.





**POLAR STAR MINOR THREE GANG**

Cadmium Plated Steel frame mounted on flexible baseplate. Sections matched within 1/2% or 1 mmfd. (whichever is the greater). Trimmers operated from top. 3 x .0005 Condenser only **18/9**

- Complete with Arcuate dial, as illustrated. (calibrated in wavelengths and 0°-100°). Price 24/6
- Complete with Panel Mounting Disc Drive (calibrated 0°-180°). 23/9
- Complete with Moving Scale Disc Drive (calibrated in wavelengths and 0°-180°). 23/3

The Polar Star Minor 3 gang Condenser is approved by the designer of the "A.V.C. Three." Its accuracy and dependability are features which assure its perfect tuning.

Three alternative drives are available, each designed to operate with the Star Minor Condenser, thus giving scales calibrated either in degrees or wavelengths.

**WINGROVE & ROGERS LTD.**  
188-9, Strand, London, W.C.2.

Phone: Temple Bar 2244/5/6.  
Polar Works: Old Swan, Liverpool

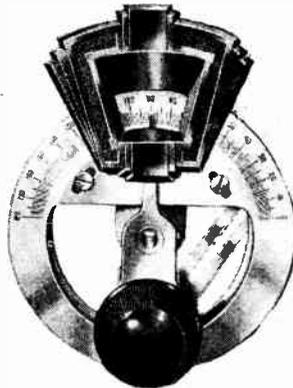
**POLAR**

CONDENSERS & DRIVES

Recommended for the

**A.V.C THREE**

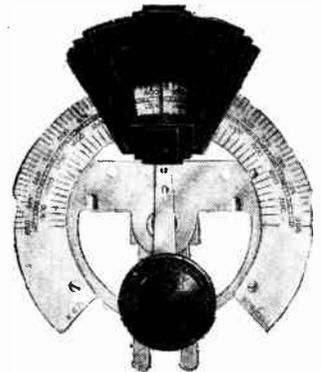
Polar Drives suitable for the 'Star Minor' 3 Gang



**POLAR PANEL MOUNTING DRIVE**

A slow motion drive with bevelled scale mounted behind panel. Operates either single or gang condensers. Provided with lampholder Moulded escutcheon Price

**5/-**



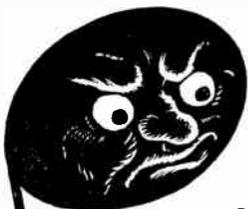
**POLAR MOVING SCALE DRIVE**

Slow motion drive fitted with moving scale. Calibrated in wavelengths and degrees. Moulded escutcheon. Can be supplied with air dielectric trimmer of 50 mmfd. variation fitted to drive on the "Uniknob" principle at 2/- extra. Price

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3785

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"CRACKED AGAIN! You're a disgrace! You haven't been sticking to Tungram valves, my lad - no note ever got cracked from one of those. They're too particular!"



- THERE'S A TUNGSRAM VALVE FOR EVERY RADIO NEED
- TUNGSRAM'S VIVID TONE PUTS NEW LIFE INTO OLD SETS
- FULL RANGE OF UNIVERSAL A.C./D.C. VALVES
- IF YOU'VE A RADIO PROBLEM, WRITE OUR TECHNICAL DEPARTMENT AND THEY WILL HELP YOU GLADLY

BUT AT PRICES FROM 5/6  
THE WORLD'S FINEST



**TUNGSRAM**  
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Wherever  
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"Ohmite"  
means  
"The  
Best  
Resistance"



"Better than wire wound."

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The most popular and efficient type of fixed resistance for all general purposes. "Better than wire wound." All values, 50 ohms to 5 megohms.

HEAVY DUTY TYPE 2/3

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**GRAHAM FARISH PRODUCTS**



Safe maximum current carrying capacity of "Ohmites."

100° F Temperature Rise			
Ohms.	Milliamps.	Ohms.	Milliamps.
1,000	40	20,000	8
2,000	35	30,000	6-75
3,000	29	40,000	6
4,000	24	50,000	5-5
5,000	20-25	60,000	5
10,000	12	80,000	4-24
Other values pro rata		100,000	3-5

Safe maximum current carrying capacity of "Ohmites" Heavy Duty Type.

100° F Temperature Rise			
Ohms.	Milliamps.	Ohms.	Milliamps.
1,000	80	20,000	16
2,000	70	30,000	13-5
3,000	58	40,000	12
4,000	48	50,000	11
5,000	40-5	60,000	10
10,000	24	80,000	8-48
Other values pro rata		100,000	7

Ensure a safe and efficient Aerial and Earth. The new AEROFICIENT KIT provides all you need. Complete 6/6  
Send a postcard for our new Catalogue, which describes all our products.

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A

# Test BLUE SPOT SPEAKERS *and hear the difference*

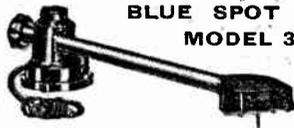
The very high standard of performance given by Blue Spot Speakers is due simply and solely to "QUALITY." In design, workmanship and materials used in construction only the very best quality is good enough for Blue Spot.

As a result Blue Spot Speakers give a performance that is as near to perfection as modern technical science has yet been able to approach. On any comparative test—appearance, construction, performance—Blue Spot Speakers will quickly prove their superiority.

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Just write your name and address in the margin and post in open envelope (1d. stamp). W.W.83.5

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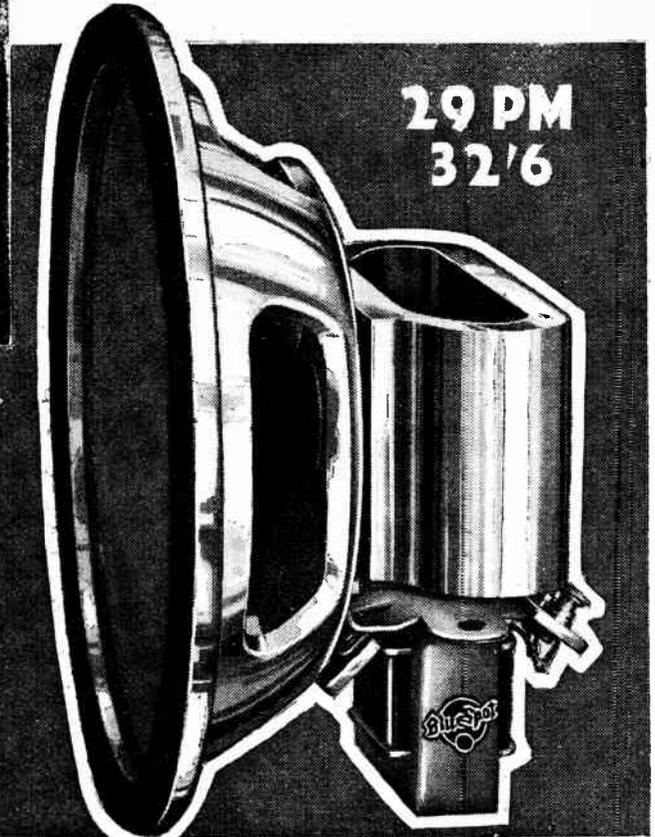


with wire wound volume control and rotating head ... 35/-

**THE BRITISH BLUE SPOT COMPANY, LTD.**  
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Phone: (Clerkenwell) 3570. Telegrams: "Blue Spot, Filing, London."  
Distributors for Northern England, Scotland & Wales: H. C. RAWSON  
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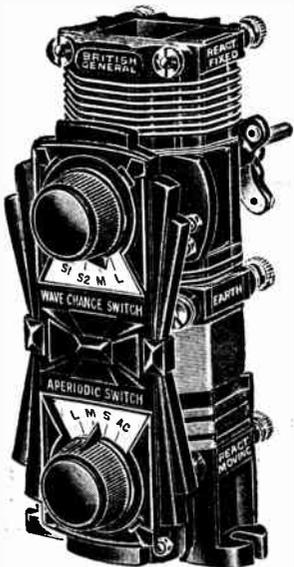
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## CONVERT YOUR SET INTO AN ALL WAVE SET

for **9'6** only **9'6**

All wavelengths from 14.5 to 2,000 metres covered by this British General All-wave Tuner.



Free wiring diagrams, showing how you can build or convert your set, supplied Free. State circuit when ordering.

From all dealers or direct from the manufacturers—

# BRITISH GENERAL

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Transformers of Superlative Quality

Specified by the Designer of "The Wireless World"

### A.V.C. THREE

#### VORTEXION A.C. 34 TRANSFORMER

passed "The Wireless World" Test—a proof of its quality.

Every Transformer is massively built of best quality material. Varnished paper interleaving, subjected to 2,000 volts test between windings, ensures an exceptionally large safety factor.

VORTEXION WILL NEVER LET YOU DOWN.  
TRADE SUPPLIED.

### SPECIAL POWER SMOOTHING CHOKES

for this receiver 30 henrys 50 m.a.

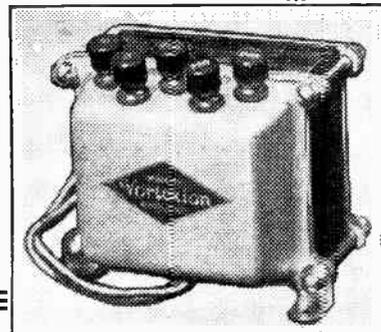
**7'6**

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## Technical Information Concerning the Mazda AC/S<sub>2</sub>. Pen. and AC/HL. DD.

WE want to give you a few points in connection with these two valves, because we feel that they will be of interest to those who follow valve development.

Let us start with the AC/S<sub>2</sub>. Pen.

The main function of this valve is for use as a self-oscillating frequency changer (or first detector) in a super-heterodyne receiver. The chief point to remember is that this valve has the highest slope and conversion conductance ever achieved in a screened pentode valve. In point of fact, the conversion conductance, when used as a frequency changer, is over 2,000 microamperes per volt. This means that with 100,000 ohms coupling coils the gain when used as a frequency changer is over 200. With 250,000 ohms coupling coils the gain when used as a frequency changer is over 500 and gives twice the efficiency of conversion of any other valve. This valve can handle very large outputs without any harmonic distortion. Consequently "whistles," "squeals" and "birdies," which are common to many super-heterodyne receivers, are reduced when this valve is used. Another special feature of the AC/S<sub>2</sub>. Pen. is that its construction eliminates background noises. This is a very important factor to be considered in choosing the first detector for a super-heterodyne receiver. The metal coating and the "earth" grid are connected to separate pins in the seven pin base, thus avoiding re-radiation. This valve can also be used as a grid-leak or anode bend detector.



THE AC/HL. DD. is an indirectly heated double diode triode for use in automatic volume control circuits. It combines in one bulb the characteristics of the well-known Mazda AC/HL. valve with a specially designed double diode to ensure distortionless rectification of signals. The diode section of the valve is completely screened, ensuring stability in operation.

In addition to use in ordinary automatic volume control circuits, it has been specially designed for use in amplified automatic volume control circuits where great uniformity in characteristics is required from valve to valve, and where the heater insulation must be of a very high order to minimise hum. The leakage current flowing from heater to cathode when 100 volts is applied is only a fraction of a microampere.

The valve may be used as:

- Half or full-wave detector, followed by an amplifier.
- Half or full-wave detector, with triode amplifier, using A.V.C.
- Half-wave detector with delayed A.V.C. and amplifier stage.
- Amplifier delayed A.V.C. with half-wave rectifier.

Some take chances . . .

Others buy

# MAZDA

The Safety Valve

Mazda Radio Valves are manufactured in Great Britain for The British Thomson-Houston Co., Ltd., London & Glasgow.

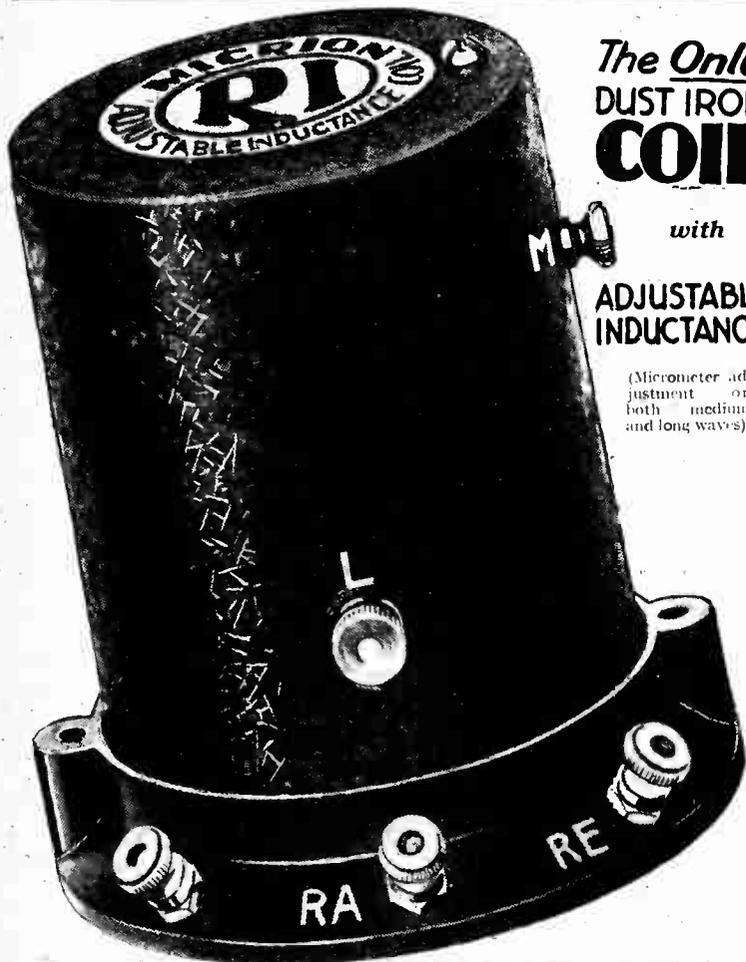


THE EDISON SWAN ELECTRIC CO. LTD.  
155, CHARING CROSS ROAD, W.C.2.

(12T)

**Superhet Efficiency by Merely Changing Coils**

**MICRION**



*The Only*  
**DUST IRON COIL**

with  
**ADJUSTABLE INDUCTANCE**

(Micrometer adjustment on both medium and long waves).

**IMPEDANCE TUNING IS AN ENTIRELY NEW SYSTEM**

which makes the advent of the "MICRION" Coil a milestone in the progress of radio development; it is the outstanding achievement of 1933 '34. By substituting the "MICRION" Coil (or coils) for existing coils, your old set may be brought right up to date and given an almost unbelievable increase in selectivity and range.

PARTICULARLY DOES THIS APPLY TO CONSTRUCTORS WHO HAVE BUILT SETS WITH THE POPULAR AND FAMOUS DUAL RANGE COIL which although in its day giving truly remarkable results, is now superseded by the "MICRION" Coil, that is designed for modern broadcasting conditions that now render older coils obsolete. The "MICRION" Coil replaces all existing coils without alteration of the circuit, and thus renders old sets modern without costly and difficult alterations to the circuit and calibration

List No. B.Y. 36, Actual size, 2 1/2 ins. diameter, 3 ins. high.

**SUPERHET EFFICIENCY for**  
Ask your dealer for "MICRION" Folder.

**12/6**



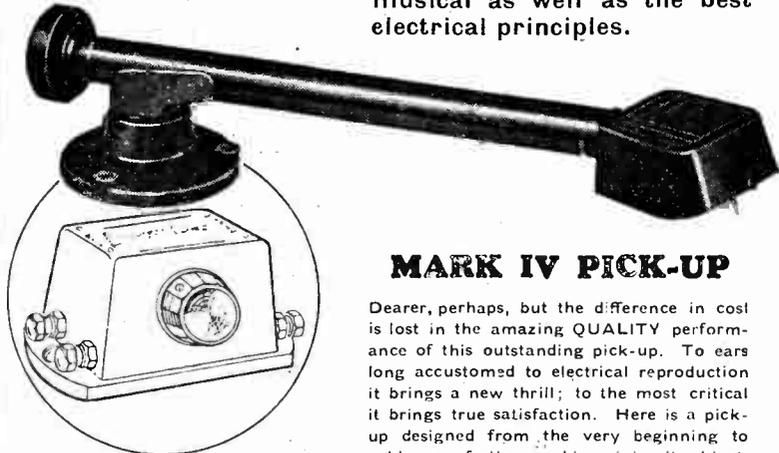
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Dearer, perhaps, but the difference in cost is lost in the amazing QUALITY performance of this outstanding pick-up. To ears long accustomed to electrical reproduction it brings a new thrill; to the most critical it brings true satisfaction. Here is a pick-up designed from the very beginning to achieve perfection, and in gaining its object, the BOWYER-LOWE MARK IV Pick-up has won unstinted praise everywhere. This is the pick-up to use if you value QUALITY.

**COMBINED TONE AND VOLUME CONTROL** affords separate and perfect adjustment of volume and tone. Is indispensable to users of Bowyer-Lowe and all pick-ups. In bakelite case. Connects in an instant.

**10/-**

*Matched Response Pick-up (rotating head) with swivel arm on ball bearings, base and support. In Florentine bronze and brown Bakelite to match*

**42/-**

In cases of difficulty send direct with name of your usual Dealer. Also for Lists. **BOWYER-LOWE & A.E.D. LTD., DIAMOND WORKS, BRIGHTON**

**8 meters in one!**

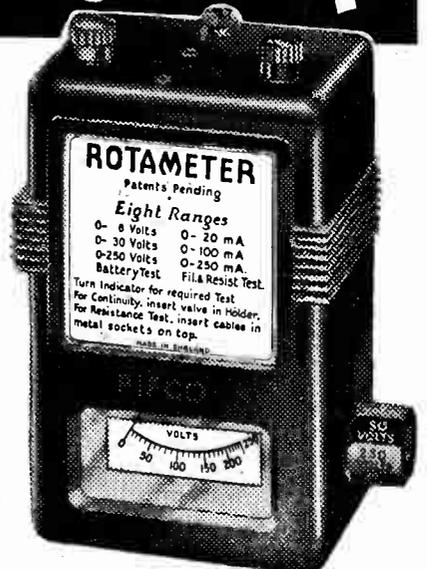
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Ask your dealer about it or write direct to:

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High Street,  
MANCHESTER, and  
150, Charing Cross Rd.,  
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**PIFCO ROTAMETER**

Price complete  
**29/6**



**ROTAMETER**

Patents Pending  
**Eight Ranges**  
0-8 Volts 0-20 mA  
0-30 Volts 0-100 mA  
0-250 Volts 0-250 mA  
Battery Test File Resist Test  
Turn Indicator for required Test  
For Continuity, insert valve in Holder.  
For Resistance Test, insert cables in metal sockets on top.  
MADE IN ENGLAND

# the new G.E.C. H.T.

with the  
**STABILISED ELECTROLYTE**  
**PURITY • POWER • LONGER LIFE**  
120 volt • 144,000 milliwatt hours  
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PRICES :  
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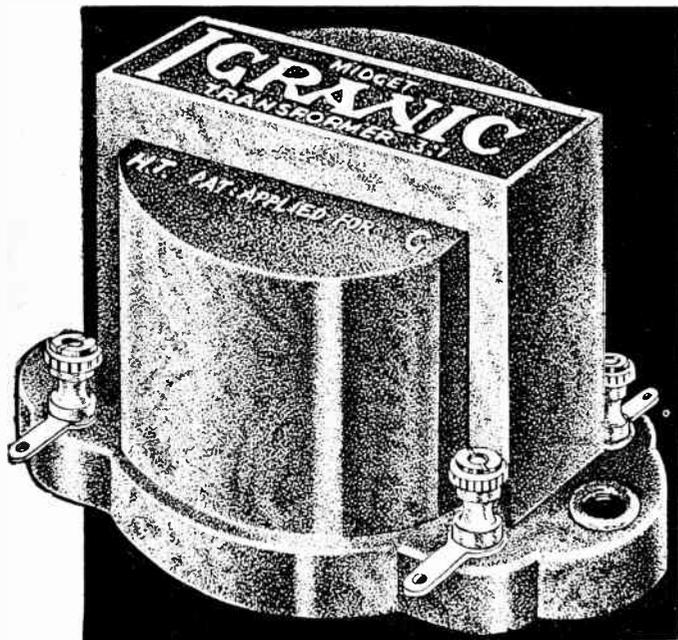


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## A TRIAL MEANS YOU'LL ALWAYS USE G.E.C. H.T.

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### IGRANIC MIDGET TRANSFORMER

Igranic have specialised in Transformer manufacture since the inception of Broadcasting, and many years of experience and costly research has lead to the production of the "Midget" Transformer—unsurpassed for quality and performance. This wonderful Transformer renders the highest standard of tonal purity without a trace of "drumming." Its production reaches a standard never previously attained by a Transformer of such reasonable price. Supplied in ratios 3-1 and 5-1. Price **8/6**

Write for fully illustrated Catalogue No. U.356 of Igranic Quality components.

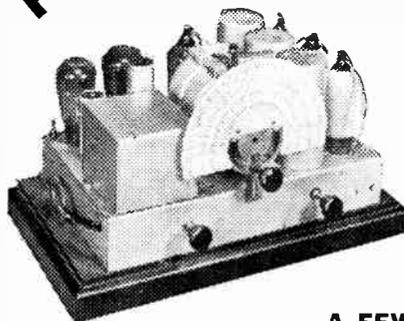
Igranic Electric Co. Ltd., 149, Queen Victoria St., E.C.4.

**IGRANIC COMPONENTS WILL BE THE MAKING OF YOUR SET**

CVS—55

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All Sets Suitable for Tropical Use.



- Considerable fluctuations of mains voltage do NOT affect tuning.
- The Superhet, with automatic volume control on short, medium and long waves.
- Each set is tested INDIVIDUALLY on reception of American station IN DAYLIGHT.
- A separate scale is used for each waveband and calibrated in wavelengths, operated by ONE Tuning Knob.

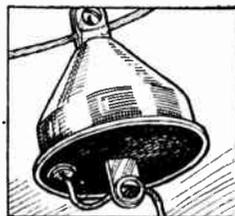
#### A FEW POINTS OF INTEREST :—

- (1) Full Calibration, which remains constant.
- (2) Fitted with Mains Aerial and with sockets for Gramophone Pick-up.
- (3) Distortionless volume control is incorporated with the Mains Switch on both radio and gramophone.
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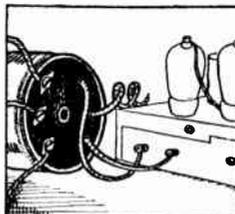
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## EXIT INTERFERENCE!



'RADIOFORMER'

TYPE A. Top groove clamps aerial securely, while lead-in fits under washer in base and passes down to 'Radioformer.'



'RADIOFORMER'

TYPE S. Fitted to Set.

### The Radioformer

removes the greatest bugbear of wireless reception—man-made Static. By fitting the Radioformer, a perfectly simple job, interference caused by electrical apparatus can be immediately and definitely stopped. Consisting of the Aerial and Set Radioformers, with 50 feet of shielded down lead, the kit will make a world of difference to the reception of any set on wavelengths from 15 to 550 metres,

and with only the slightest weakening of the less powerful signals on the long waves.

**17/6**

Complete, post free.

#### SINGLE UNITS

Aerial Transformer	
Type A. . . . .	7/6
Set Transformer	
Type S. . . . .	7/6
Shielded Cable, 50 ft.	4/6
Ditto 100 ft.	8/6

The **RADIOFORMER** eliminates "static" when the set is tuned to a station. Many sets fitted with A.V.C. become extremely sensitive between stations, and pick up a great deal of noise. The so-called interference suppressors are fitted to reduce this noise between stations whereas the **RADIOFORMER** reduces the noise which interferes with pure reception of a station. Pat. applied for.



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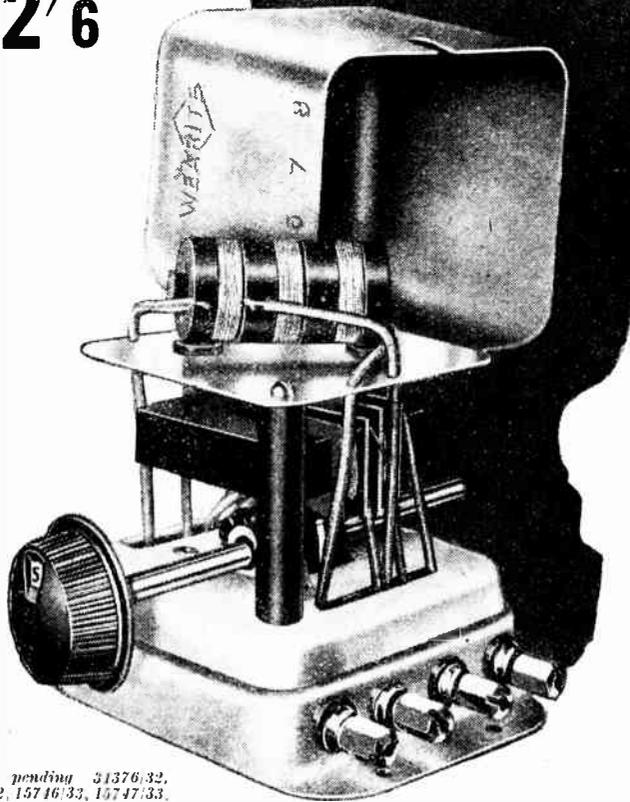
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**The Senior  
WEARITE-NUCLEON  
IRON CORE COIL**

**12/6**



*Patents pending 51376/32,  
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Pending Registration Trade  
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**NUCLEON**  
IRON CORE COILS

are Specified for the

**A.V.C. THREE**

A.V.C. is made possible in this up-to-date receiver because of the good signal strength initially obtained. In other words, because of the efficiency of its tuning circuit—of the use of Nucleon Iron Coils. Permitting an extremely high degree of selectivity, permitting the valves to make the best use of their characteristics, Nucleon Iron Core Coils become an essential to the perfect functioning of the A.V.C. Three—Make sure of your results—follow the designer.

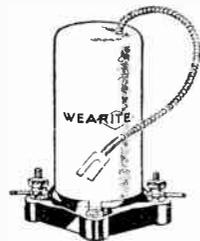
**WRIGHT & WEAIRE LTD.,**  
740, High Road, Tottenham, N.17.

Telephone: Tottenham 3847/8.

**FROM THE DESIGNER'S  
SPECIFICATION SHEET**

- One Wearite Nucleon B.P.1. Coil..... **12/6**
- One Wearite Nucleon B.P.2. Coil..... **12/6**
- One Wearite Nucleon T.G. Coil..... **12/6**
- One Wearite H.F. Choke (with pigtail)  
H.F.P.A. .... **4/-**

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**The Following**  
components of the Wearite range are suitable for inclusion in the A.V.C. Three—and are according to designer's specification.

- One Wearite Mains Transformer B.W.W. **27/6**
- One Wearite Mains Choke H.T.35..... **10/6**

**SEND FOR YOUR COPY**

of the new Wearite Booklet and for the Full-size Blue Print with constructional details for building the "WEARITE-TEAMSTER" 4 VALVE RECEIVER. Use this Coupon . . .

**COUPON** To Messrs. **WRIGHT & WEAIRE Ltd.**,  
740, High Road, Tottenham, London, N.17.

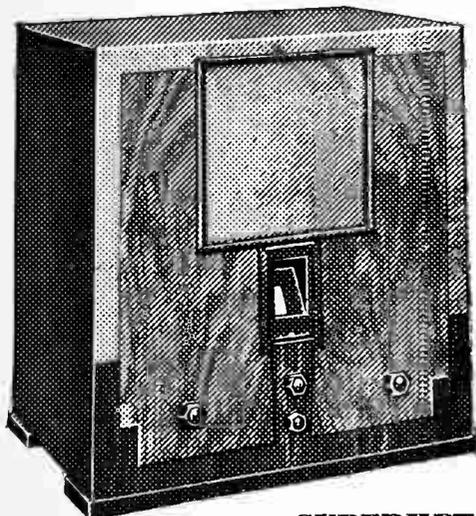
Please send me a copy of your new booklet, No. S.32, giving full details of your components, together with technical data, and also Full-size Blue Print with constructional details for building the "WEARITE-TEAMSTER." I enclose 3d. in stamps to cover cost and postage.

NAME.....

ADDRESS.....

Please write in block letters.....  
W.W. 13/10/33

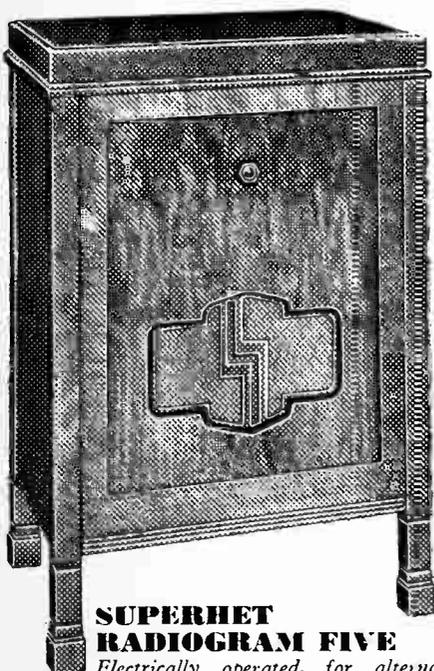
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**SUPERHET  
CONCERT SEVEN**

Electrically operated, for A.C. mains. Superheterodyne circuit employing variable mu valves. Seven Marconi valves (including rectifier). Delayed automatic volume control. MUSH and static suppressor. Duplex tone control. Adjacent channel selectivity. Energised moving coil speaker. Optically magnified illuminated scale. Modern cabinet of finely figured woods.

MODEL 467 **Price 22 Gns.** Or by Hire Purchase.



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Electrically operated, for alternating current. Five Marconi valves (inc. rectifier). Variable mu I.F. amplifier. New type energised moving coil speaker. Superheterodyne circuit with band-pass tuning. Separate illuminated wavelength scales on motor board, with names of principal stations. Self-contained aerial device. Beautiful pedestal cabinet in finely figured walnut.

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OF RADIO SETS TO-DAY THERE IS NO END. Moreover, most people defend the particular set they own with such fervour that you would think personal honour involved. All this makes things the more difficult for a listener choosing his new set. *He* wants absolutely disinterested advice. And when you come to think of it, what more severe and incorruptible critic could there be than the dog? He has no set to defend, and consummate indeed must be the realism which persuades him to hear his master's voice from anything but his master's lips!

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# The Wireless World

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*As many of the circuits and apparatus described in these  
pages are covered by patents, readers are advised, before  
making use of them, to satisfy themselves that they would  
not be infringing patents.*

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## EDITORIAL COMMENT

### Common Waves

#### Limitations of the Scheme

**N**OW that London National and West Regional transmitters have for some time been operating on a common wavelength of 261.6 metres, the opportunity has been provided for forming an opinion as to the value of a synchronising system of this nature as a compromise to assist in overcoming the troubles of wavelength congestion in Europe.

It does not appear that the B.B.C. has any intention of continuing this twin wavelength arrangement permanently, for under their present plan, as soon as Droitwich is ready to operate as the new long-wave National transmitter, most of the remaining stations in different parts of the country will give Regional programmes alternative to the National, and the present medium-wave National programmes will cease.

This technical experiment of synchronising the London National and West Regional has been interesting, if only because it has proved to the satisfaction of most listeners, and we hope to broadcasting authorities in general, that such a scheme has very little to recommend it. The B.B.C. frankly admits that anywhere outside a reliable service range of these transmitters, which they put at approximately 40 to 50 miles, common-wave interference occurs. This interference takes the form of a beat, which so chops the reproduction that in the case of speech it gives the impression that the speaker is stuttering. These two stations, therefore, which under normal conditions (if they had wavebands to themselves) would have an after-sunset range which we may conservatively place at 200 miles, can now serve no more than a local area.

Common wavelength schemes of this nature would, it appears, prove worth while only where stations are very widely spaced geographically and where it is not desired that either of them should serve listeners at any distance. It would not matter, for instance, if an English station were synchronised with another in Russia, so long as it was not desired that either should be intelligible beyond its own national boundary.

Little is to be gained if, in the process of saving one wave channel, the area covered by each station is reduced to approximately one sixteenth of what might be expected of it after sunset, yet this is what does actually occur.

It is useless for the B.B.C. to regard the service area of a station as only some fifty miles radius, for if that were accepted our B.B.C. stations would fall very far short of serving the total area of the country.

### The A.V.C. Three

#### A Receiver of Unusual Performance

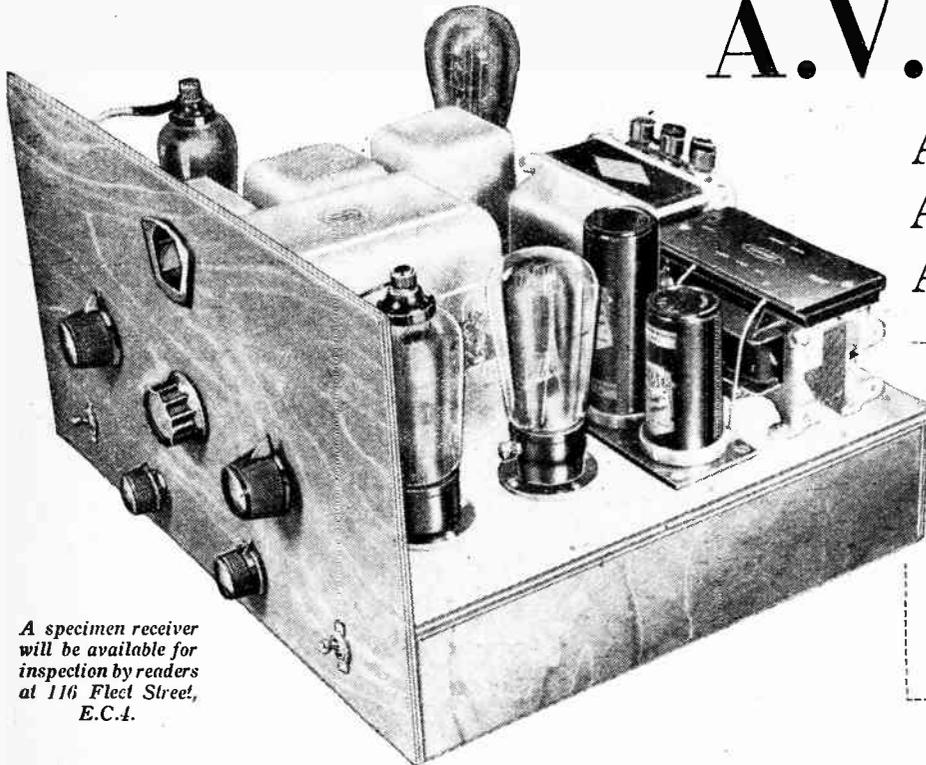
**H**ITHERTO the advantages of automatic volume control have been generally available only to owners of sets of the superheterodyne class, or straight sets having two high frequency stages. The receiver described in this issue should, therefore, be of very special interest to our readers, as although there is only one H.F. stage, delayed amplified automatic volume control is incorporated, whilst at the same time retaining reaction.

The three-valve set is undoubtedly the most popular type of all, and now, with the addition of automatic volume control, we anticipate that this set will make a strong appeal and give excellent service in the coming winter, the automatic volume control increasing still further the interest in distant reception.

# "The Wireless World"

## A.V.C. Three

### A Selective Three-Valve A.C. Mains Receiver with Automatic Volume Control



A specimen receiver will be available for inspection by readers at 116 Fleet Street, E.C.4.

*DELAYED amplified A.V.C. is a form of automatic volume control which lends itself particularly well to use in the smaller class of receiver where a moderate detector input and reaction are both necessities. "The Wireless World" A.V.C. Three for the first time combines delayed amplified A.V.C. with reaction and so represents a step forward in that the disadvantages of fading with the smaller class of receiver are reduced.*

**T**HE three-valve receiver still deservedly retains its popularity, for when it is used with a good aerial it is capable of bringing in the more powerful of distant stations at good volume, while the quality of reproduction can be very satisfying. Moreover, the introduction of iron-core type tuning coils has led to such an increase in the selectivity obtainable that good results in distant reception are now possible even at short distances from the local station.

In the past, automatic volume control has not been applied with any great success to a receiver of this nature, since

the systems available either led to an inadequate control or prohibited the use of reaction, without which the maximum sensitivity is likely to be inadequate. It is possible, however, to modify the amplified A.V.C. circuit in such a manner that both good A.V.C. and reaction are obtainable.

The circuit diagram of the new receiver is shown in Fig. 1, and it will be seen that the H.F. valve, which is of the screened H.F. pentode type, is preceded by a band-pass filter employing iron-core coils. The filter coupling is of the mixed capacity type, the lower capacity being the 0.05 mfd. condenser C2 and the upper the

condenser C1. The coupling between the H.F. and detector stages is by means of a shunt-fed transformer to which reaction is applied. The primary of the transformer is fed by means of the screened H.F. choke Ch1 and the 0.0005 mfd. condenser C5, and the tuned circuit itself is connected through the 0.0001 mfd. condenser C6 to one diode of the duo-diode-triode valve which provides signal rectification, L.F. amplification, reaction, and delayed A.V.C. When the switch S2 is in the upper position on the diagram, the 0.25 meg. resistance R7 is connected between the diode anode and cathode, and it acts as the diode load resistance, and is analogous to the grid leak of an ordinary detector. There are developed across this resistance H.F. potentials due to the sig-

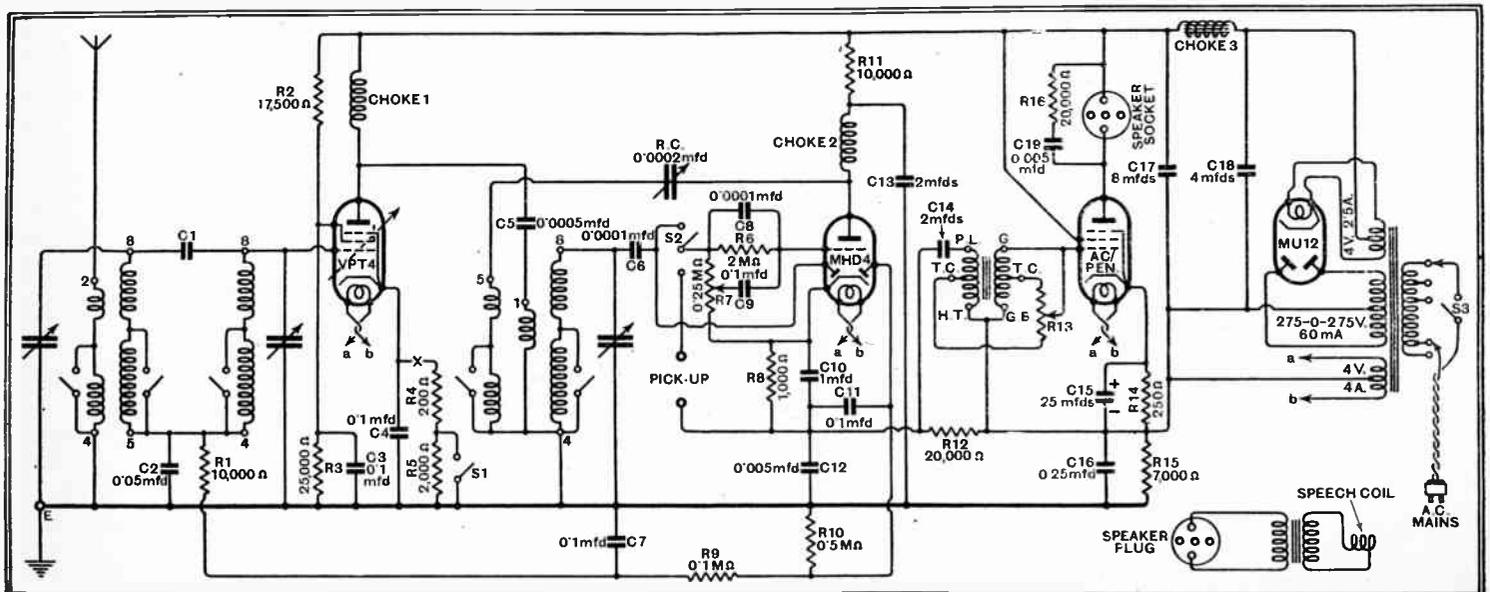
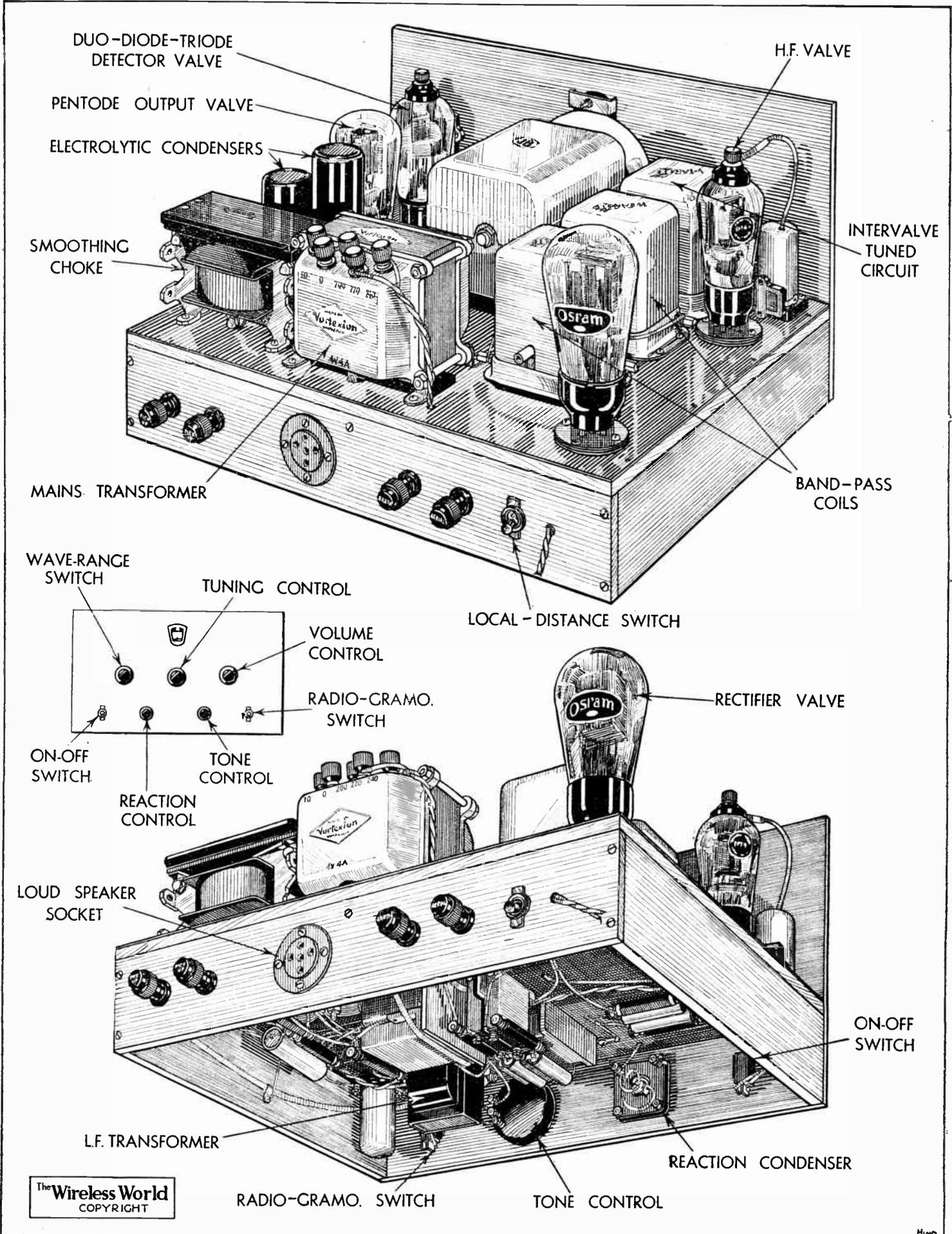


Fig. 1.—The complete circuit diagram shows that delayed amplified A.V.C. is obtained with the duo-diode-triode valve, and that this also serves to give signal rectification, L.F. amplification and reaction. The potentiometer R7 acts as the manual volume control and is operative on both radio and gramophone

# The Chassis of the New A.V.C. Set



The Wireless World  
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The positions of the chief components can readily be seen in these drawings of *The Wireless World* A.V.C. Three, and it will be noted that the layout adopted is one leading to a straightforward assembly and easy wiring.

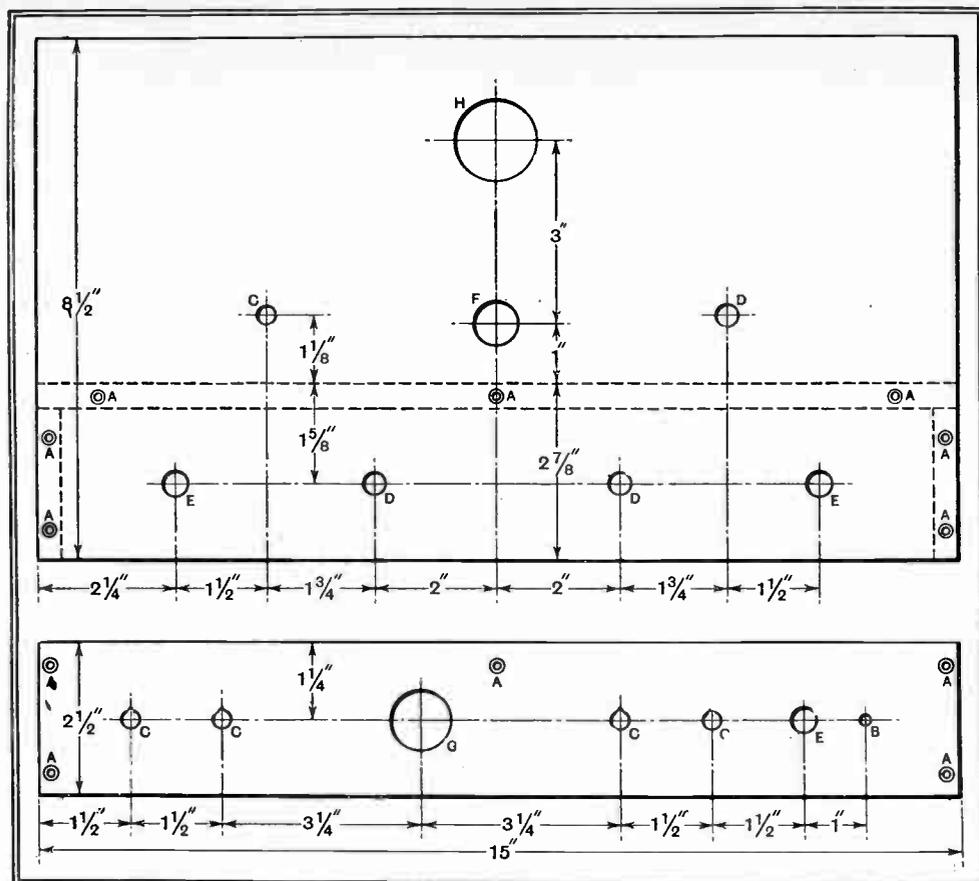
MIND

"The Wireless World" A.V.C. Three—  
 nal, with L.F. and D.C. potentials due to its rectification. The latter two are applied to the triode grid in the usual way through the condenser C9 of 0.1 mfd. and the 2 megohms resistance R6, the connection of C9 being made to the slider of the resistance R7, for this serves as the manual volume control as well as the diode load resistance. The H.F. potentials are applied to the triode grid through the 0.0001 mfd. condenser C8, which shunts R6. On gramophone, S2 is in the lower position on the circuit, and the pick-up is returned to the cathode through the biasing resistance R8 of 1,000 ohms shunted by the 1 mfd. condenser C10.

The A.V.C. Circuit

In the anode cathode circuit of the triode, therefore, there appear H.F. currents, L.F. currents, and a change of direct current upon the application of a signal. The H.F. currents perform their useful function in the anode circuit, and are deflected through the reaction condenser R.C. to the reaction coil by the H.F. choke Ch2. Decoupling from L.F. currents in the H.T. supply is obtained with the aid of the 10,000 ohms resistance R11 and the 2 mfd. condenser C13. The H.F. currents are not required in the cathode circuit, and are consequently by-passed by the 0.005 mfd. condenser C12.

The load resistance to L.F. currents is in the cathode circuit, and consists of the 20,000 ohms resistance R12, from which the primary of the L.F. transformer is shunted through the 2 mfd. condenser C14. Now it will be observed that the resistance R12 is returned directly to negative H.T., whereas the earth line of the set, to which the H.F. valve cathode circuit is returned, is connected to negative H.T. through the

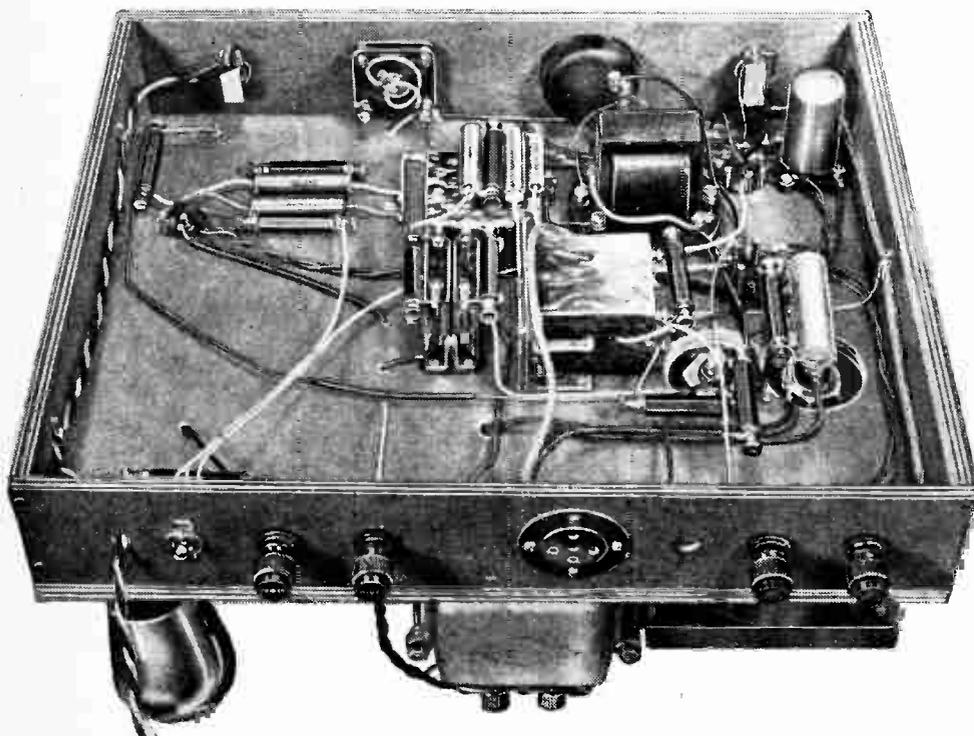


The drilling dimensions of the panel and terminal strip are shown here ; the sizes of the holes are : A=1/8in. B=3/16in. C=5/16in., D=3/8in., E=7/16in., F=3/4in., G=1in., H=1 1/4in.

7,000 ohms resistance R15 shunted by the 0.25 mfd. condenser C16. The cathode of the H.F. valve, therefore, is positive with respect to negative H.T. by the drop across R15. With no applied signal the voltage drop across R12 is greater than that across R15, so that the MHD4 cathode is more positive than the H.F. valve cathode, and is consequently positive with respect to

the earth line. Now the grid of the H.F. valve is returned to the earth line through the 10,000 ohms resistance R1, the 100,000 ohms resistance R9, and the 500,000 ohms resistance R10, the condensers C7 and C11 serving as by-pass capacities. R10 is also connected to the second diode anode, but as the cathode is positive with respect to the earth line, the anode is negative with respect to the cathode, and is non-conductive. There is thus no current flow through any of the resistances included in the H.F. valve grid circuit, and the grid potential of this stage is consequently only that provided by the minimum bias resistance R4, assuming the switch S1 to be closed.

When a signal is applied the triode grid is negatively biased as a result of rectification, and the triode anode current drops. The triode cathode becomes less positive, therefore, and if the signal be strong enough the drop across R12 becomes less than that across R15 and the cathode is then negative with respect to the earth line. The second diode anode, therefore, is positive with respect to the cathode, and it becomes conductive and assumes practically the same potential as the cathode. For all practical purposes the grid of the H.F. valve may be considered as following the potential of the triode cathode, since it is connected to it through a series of resistances, and the diode-cathode path of the valve. As the signal increases in strength, so the triode cathode becomes more and more negative with respect to the earth line, and the H.F. valve grid follows it and becomes increasingly biased negatively, thus reducing its amplification.



An under-baseboard view of the receiver showing the by-pass condensers and the voltage dropping resistances.

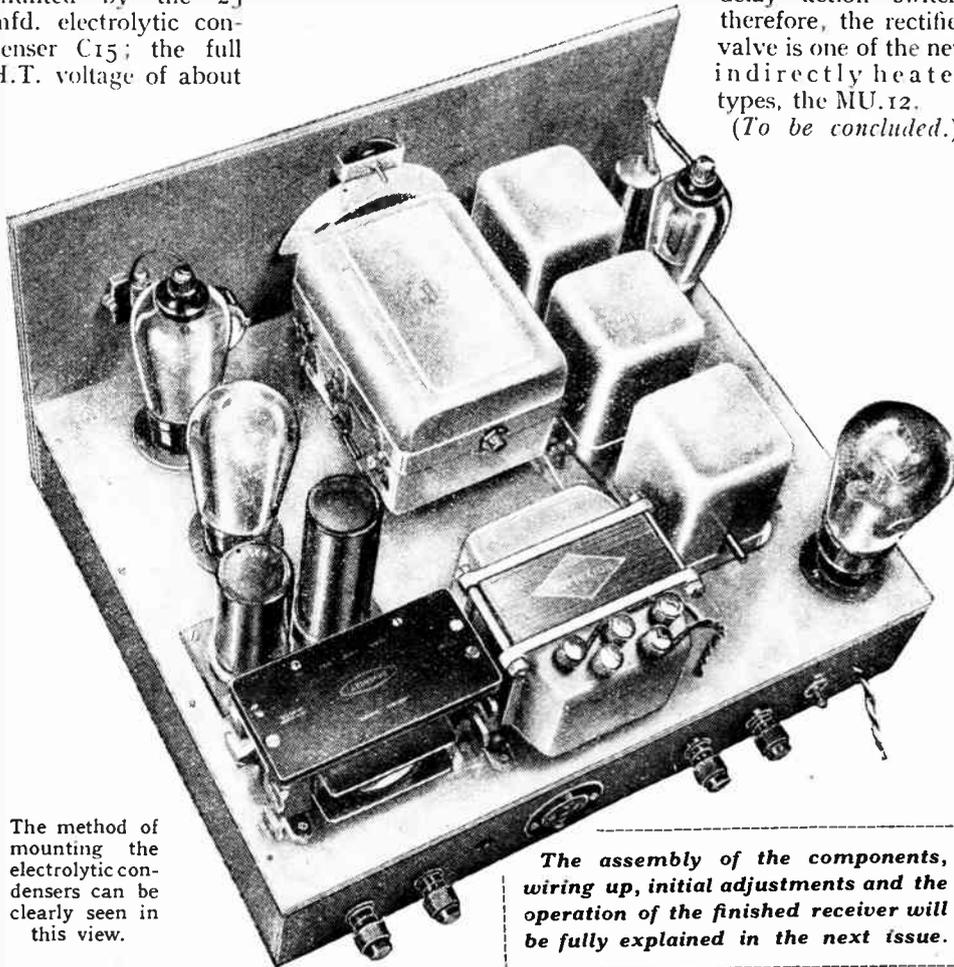
**"The Wireless World" A.V.C. Three—**

At first glance the arrangement appears somewhat complicated, but it is essentially simple and straightforward in operation, and the rest of the set follows normal practice. The L.F. transformer secondary feeds the control grid of the output pentode, which is of the indirectly heated type rated for an output of about 2½ watts. The cathode is returned to negative H.T. through the 250 ohms bias resistance R14 shunted by the 25 mfd. electrolytic condenser C15; the full H.T. voltage of about

250 volts is thus applied to the output valve. The mains equipment consists of the usual mains transformer with a full-wave rectifier valve and a single smoothing choke Ch3 operating in conjunction with the electrolytic condensers C18 and C17 of 4 mfd. and 8 mfd. respectively.

The three receiver valves are all of the indirectly heated type; in order to avoid an excessive voltage rise on switching on without employing a delay action switch, therefore, the rectifier valve is one of the new indirectly heated types, the MU.12.  
(To be concluded.)

- Wood panel, 1-ply, 15in. x 8½in.
- Plymax Baseboard, 12in. x 15in. x ¼in. Peto-Scott
- 2oz. No. 20 tinned copper wire, 6 lengths Systollex Wire, Wood, Paxolin, Flex, etc.
- Screws: 19 ¼in. No. 4 R/hd., 18 ½in. No. 4 C/sk., 36 ½in. No. 4 R/hd., 1 GBA 1 in R/hd. with nut and washers.
- Valves:—1 Osram or Marconi MHD4, 1 Osram or Marconi MU12, 1 Mazda AC/Pen., 1 Ferranti VPT4, or Mullard VP4



The method of mounting the electrolytic condensers can be clearly seen in this view.

The assembly of the components, wiring up, initial adjustments and the operation of the finished receiver will be fully explained in the next issue.

**THE LIST OF PARTS**

After the particular make of component used in the original model, suitable alternative products are given in some instances.

- |   |   |
|---|---|
| 1 3-gang Variable condenser and disc drive<br>J.B. "Nugang" No. 2064<br>(British Radiophone, Polar.)  | 2 Fixed condensers, 2 mfd., 500v. D.C. test, C13, C14<br>Telsen W.226                 |
| 1 Variable Condenser, 0.0002 mfd., R.C. Ormond R/507  | 5 Tubular condensers, 0.1 mfd. 1,500v. D.C. test, C3, C4, C7, C9, C11<br>Telsen W.411 |
| 1 Knob for above Ormond R/355   | 2 Tubular condensers, 0.005 mfd. 1,500v. D. C. test.<br>C12, C19<br>Telsen W.408      |
| 1 Iron core coil Wearite "Nucleon" B.P.1  | (Graham Farish.)  |
| 1 Iron core coil Wearite "Nucleon" B.P.2  | 1 Dry electrolytic condenser, 4 mfd. 500 working peak<br>voltage C18<br>Telsen W.396  |
| 1 Iron core coil Wearite "Nucleon" T.C.<br>(Colvern, Varley.)   | 1 Dry electrolytic condenser, 8 mfd. 500 working peak<br>voltage C17<br>Telsen W.399  |
| 1 Transformer Multitone "Toco" 1:4  | 1 Dry electrolytic condenser, 25 mfd. 25 volts, C15<br>Telsen W.399                   |
| 1 Tone control potentiometer for use with above, R13<br>Multitone   | (Dubilier, Peak, T.C.C.)  |
| 1 Volume control potentiometer, 250,000 ohms,<br>tapered R7 Watmel T4   | 1 Resistance, 200 ohms, R4<br>Graham Farish Ohmite                                    |
| (Claude Lyons, Magnum, Rothermel.)  | 1½ Watts Type   |
| 1 H.F. choke, Ch2 Wearite HFP   | 1 Resistance, 250 ohms, R14<br>ditto  |
| 1 H.F. choke, Ch1 Wearite HFFA  | 1 Resistance, 1,000 ohms, R8<br>ditto   |
| (Kinva, McMichael.)   | 1 Resistance, 2,000 ohms, R5<br>ditto   |
| 1 Power smoothing choke, 30 henrys 50 m.a., Ch3<br>Davenset No. 101   | 1 Resistance, 2,000 ohms, R15<br>ditto  |
| (R.I., Sound Sales, Varley.)  | 2 Resistances, 10,000 ohms, R1, R11<br>ditto  |
| 1 Mains transformer, 200 to 250 volts, 50 cycles<br>Secondaries: 275-0-275 volts, 4 volts, 2.5 amps centre-<br>tapped, 4 volts 4 amps, centre-tapped. | 1 Resistance, 17,500 ohms, R2<br>ditto  |
| Vortexion A.C.34  | 2 Resistances, 20,000 ohms, R12, R16<br>ditto   |
| (British Radio Gramophone Co., Bryce, Challis,<br>Davenset, Claude Lyons, Sound Sales.)   | 1 Resistance, 25,000 ohms, R3<br>ditto  |
| 4 5-pin Valve holders Clix Chassis Mounting<br>Air Sprung Type  | 1 Resistance, 100,000 ohms, R9<br>ditto   |
| 1 7-pin Valve holder Clix Floating Type<br>(W.B.)   | (Dubilier, Erie, Claude Lyons, Ready Radio, Varley.)                                  |
| 2 Fixed condensers, 0.0001 mfd., C6, C8<br>Telsen W.207   | 1 Grid leak, 2 megohms, R6<br>Graham Farish Standard Type                             |
| 1 Fixed condenser, 0.0005 mfd., C5<br>Telsen W.211  | 1 Grid leak, 0.5 megohm, R10<br>ditto   |
| 1 Fix3d condenser, 0.25 mfd. 500v. D.C. test, C16<br>Telsen W.229   | (Dubilier, Erie, Claude Lyons, Ready Radio, Varley.)                                  |
| 1 Fixed condenser, 0.05 mfd. 500v. D.C. test, C2<br>Telsen W.227  | 2 Switches, on-off, S1, S3<br>Claude Lyons 728  |
| 1 Fixed condenser, 1 mfd. 500v. D.C. test, C10<br>Telsen W.227  | 1 Switch single-pole change-over, S2<br>Claude Lyons 729                              |
|   | (British Radiophone, Belgin.)   |
|   | 1 5-pin plug<br>Belgin P.3  |
|   | (British Radio Gramophone Co.)  |
|   | 1 Length screened sleeving<br>Harbros   |
|   | 4 Ebonite shrouded terminals, A., E., Pick-up (2)<br>Belling-Lee Type B               |

**The Wireless World  
Diary for 1934**

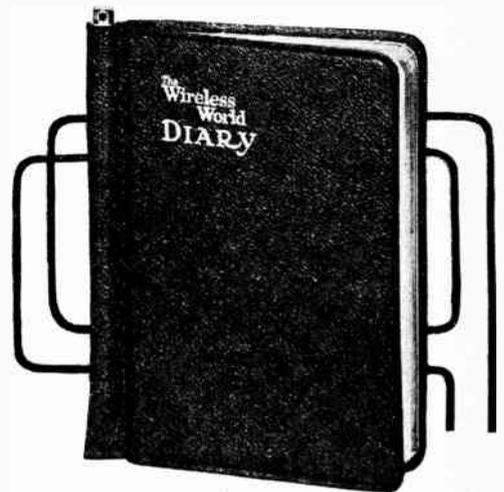
THE popular esteem in which previous editions of our Diary has been held was shown by the speed with which the issue has been sold out in past years. It is hoped that the new Diary for 1934 will find equal favour.

Those regular features which experience has shown to be most generally useful have been retained and brought up to date. The list of broadcasting stations in Europe and Northern Africa is given in accordance with the Lucerne Plan, which comes into force on January 15th, 1934.

A new feature which will appeal to all set-users is the Receiver Maintenance Records, in which particulars of battery renewals and technical notes, including valve anode currents, can be recorded.

The Useful Formulæ have been revised, and a new Abac provided for calculating decibels. The Circuit Diagram section has been retained with many new diagrams of receivers and accessories, including a short-wave superheterodyne converter and anti-interference filters and suppressing devices.

The Valve Data section now occupies thirteen pages, and gives the fullest practical information on all the modern valves.



The Diary, comprising 192 pages, is obtainable from all booksellers, stationers, and bookstalls, or direct from the publishers. Price 1s. 6d., or by post 1s. 7d.

**THE OLYMPIA CAR DISPLAY**

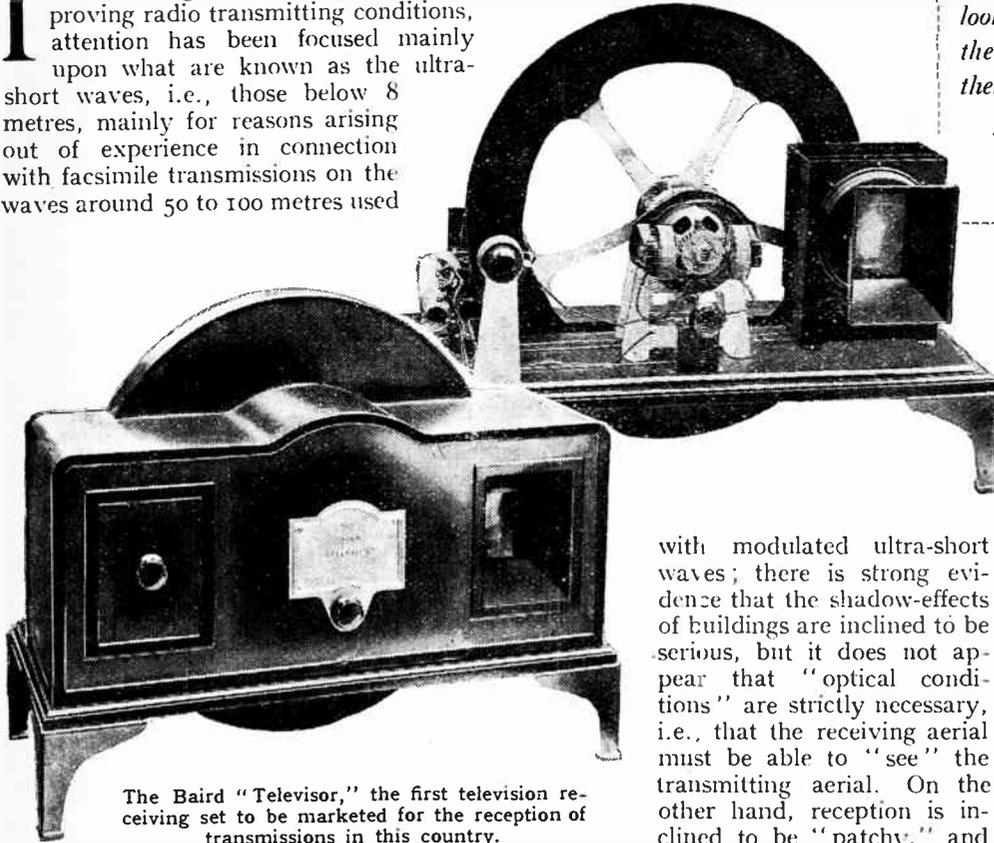
YESTERDAY the great International Automobile Exhibition opened at Olympia. While car radio in this country has as yet made little progress, there is evidence that it is likely to spring into popularity.

In connection with the Exhibition, which closes on the evening of Saturday, the 21st instant, *The Autocar* is producing three Special Show Numbers. The first issue was dated October 6th, and contained a Buyers' Guide to 1934 models, giving full specifications of all cars on the British market. To-day's issue of *The Autocar* is a complete Show Report, and next week various specially interesting features at the Show will be fully described and illustrated.

# Television Progress

## Problems of the Next Step

**I**N considering the possibilities of improving radio transmitting conditions, attention has been focused mainly upon what are known as the ultra-short waves, i.e., those below 8 metres, mainly for reasons arising out of experience in connection with facsimile transmissions on the waves around 50 to 100 metres used



The Baird "Televisor," the first television receiving set to be marketed for the reception of transmissions in this country.

for transcontinental traffic. It is, of course, well known that the latter waves depend for their long-range qualities upon reflections from the Heaviside layer, which, while giving rise to no harmful effects on telegraphic and telephonic circuits, result in confusion of a greater or less degree when visual subject matter is transmitted. Trouble as a consequence of such "echoes" has been experienced in the transmission of facsimile images at relatively low scanning speeds, and it appears to be generally considered that television on these wavelengths would be subject to far greater interference and would thus be impossible in practice.

### Wavelength and Service Area

When we come to wavelengths below eight metres we arrive at conditions where reflections from the upper atmosphere do not take place. The result of such a state of affairs is that only a more limited area can be effectively served by one broadcasting station, since the waves attenuate very rapidly as the distance from the station increases, but, on the other hand, there is the advantage that "echo" troubles entirely vanish.

Very little information is available as to the problems of serving a given area

with modulated ultra-short waves; there is strong evidence that the shadow-effects of buildings are inclined to be serious, but it does not appear that "optical conditions" are strictly necessary, i.e., that the receiving aerial must be able to "see" the transmitting aerial. On the other hand, reception is inclined to be "patchy," and it seems fairly clear that the

erection of ultra-short wave aerials in London will not be the simple business to which ordinary broadcast listeners are accustomed in connection with medium and long wavelengths.

The position in connection with improving the detail of the transmitted picture thus resolves itself into the provision (a) of an optical system which subdivides the picture into a greater number of elements, and (b) of an electrical system, including a radio link, which enables the improved detail to be effectively transmitted. The situation under the former heading necessitates a decision as to what degree of detail is essential to good entertainment value, a question which is comparable in one sense to the case of frequency band width in telephonic transmission, but in another sense stands in strong contrast to it. The decision in the case of telephony makes no difference to the design of receivers, as these can perfectly well ignore the extended frequency range if for any reason they do not want to take advantage of it; the decision in the case of television, however, is binding upon all parties, since the receiving apparatus must operate in synchronism with and in exact conformity to the transmitting apparatus.

Of these two problems the second does not require much further consideration,

***B**EFORE we jump to any conclusions in regard to the imminence of a practical television service on short waves, it is well to look at the problems involved and consider the ways and means available for solving them. These problems are discussed in the following article and an attempt is made to give them their proper perspective in the general television picture.*

since the matter of the radio link is perfectly straightforward, though, paradoxically enough, it may prove the most serious stumbling block. We have to design a transmitter which operates on the ultra-short wavelengths, is capable of being modulated over a frequency range of anything up to 500 kc/s with substantially uniform response, and has an aerial system which efficiently distributes the radiated power. On the receiving side an aerial has to be set-up which is an efficient collector, having regard to its location, and the received high frequency waves have to be amplified uniformly over whatever range of frequencies is indicated. The most serious problems are field strength and interference, and it must be borne in mind, of course, that the larger the frequency band being received the greater will be the susceptibility of the apparatus to interference, particularly from the ignition systems of motor cars. The purely technical side of building flat amplifiers does not offer insuperable difficulties, though, of course, an unusually large number of stages of amplification may be required.

### Short Wave Interference

Having done all that is to be done in these respects, it is a matter of practical experience to discover whether ultra-short wave television broadcasting is or is not possible. The writer's feeling is that a serious campaign to induce motor car manufacturers to put suppressor resistances in their ignition systems will be a necessary prelude to any sort of satisfactory service, and the success of this campaign will be the main condition of success in the whole enterprise.

We now return to the consideration of the former of the two problems, and we are at once faced with the necessity for an important series of decisions which, it must be borne in mind, have to be made for the industry as a whole. We require to settle:—

- (a) the number of times the picture is to be scanned per second;
- (b) the shape of the picture and the manner in which scanning is to be carried out;

**Television Progress—**

(c) the number of picture elements that are necessary for adequate detail. According to the present Baird system the picture is scanned  $12\frac{1}{2}$  times per second in 30 vertical strips; the shape of the picture is seven (vertical) by three (horizontal), and the number of picture points consequently 2,100.

**Service in Germany**

As a step in the direction of greater detail, the German Post Office has instituted a regular service of experimental ultra-short wave television transmissions from Witzleben in which the picture is horizontally scanned twenty-five times per second in ninety strips, the shape of the picture is five (vertical) by six (horizontal), and the number of picture points nearly 10,000.

It is advisable to examine more closely the steps by which the German authorities arrived at these figures. In the first place, both the shape of the picture and its rate of repetition are in close conformity with the standards chosen for talking films and enable transmissions to be effected by means of a film provided with scanning machinery. The difference between the picture-frequency chosen and that of twenty-four per second has an important bearing upon the problem of synchronising, since it enables motors to be used at both transmitting and receiving ends which are synchronously driven by simple apparatus from the 50 c/s a.c. mains. Had the picture frequency of twenty-four per second, characteristic of talking pictures, been retained for television purposes it would have been necessary to employ an awkward train of gears if synchronisation were to be effected by means of the 50 c/s mains, and it has evidently been found of no detriment to the results obtained to increase the speed of a talking film in the ratio 25:24 when transmitting it for television purposes.

Apart from the talking film question, considerations of flicker indicate the desirability of an increase in the picture frequency from  $12\frac{1}{2}$  per second, unless the effect of persistence of vision can be aided by fluorescence, as in the case of the cathode ray tube, or by some similar effect. The prospect of improved operation along these lines cannot be dismissed, as it is possible to obtain better detail with a slow picture frequency, other things being equal, but the importance of talking film transmission would seem to indicate a higher picture frequency such as that chosen in Germany, in spite of the disadvantages which it may entail.

**Synchronising and the "Grid System"**

It is perhaps worth while to digress for a short space to consider the synchronising problem in greater detail. Synchronism between transmitter and receiver is an essential feature of any television system and the demands for it are in the highest degree exacting, since we must not only ensure that the picture is stationary, but also that it is "correctly framed," i.e.,

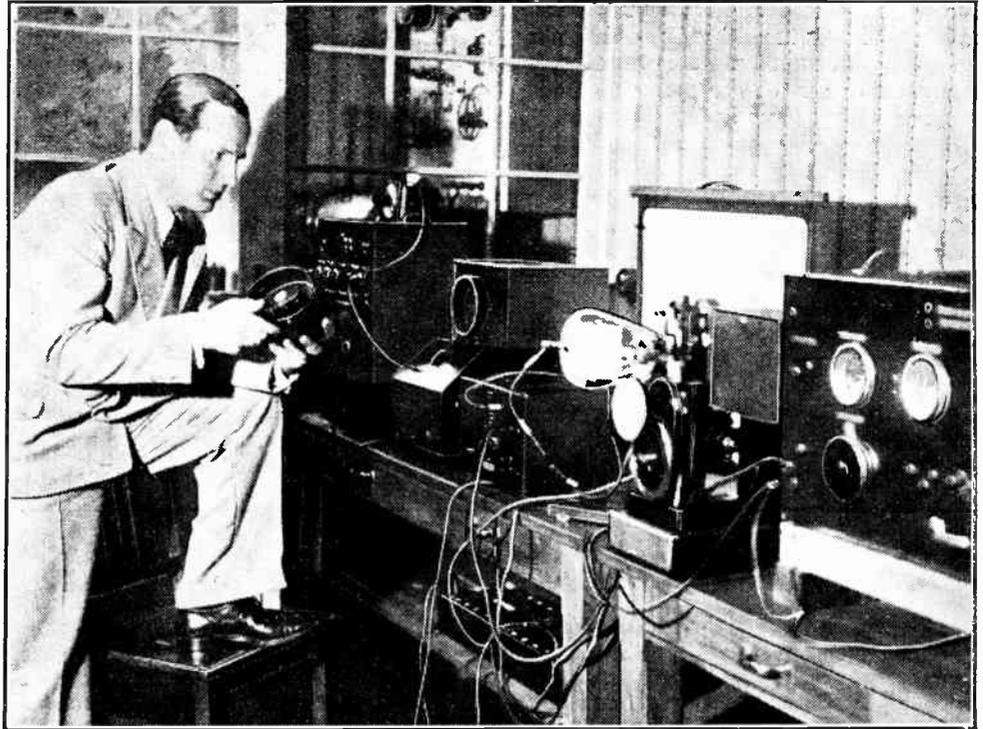
not displaced out of its right position. The latter feature necessitates a consideration of the phase relationship between the two systems; the simplest explanation is again to be found in the "book" analogy, if we consider the transmitter to be "looking" at the first word in a line and the receiver to be "pointing," say, at the middle of the same line. If the receiver is half a line ahead all the way it is clear that the left- and right-hand margins of the book page itself will appear adjacent to each other in the middle of the reproduced version at the receiver, and the original page will be divided down the middle, so that the two divisions appear on either side at the receiving end.

Many devices are known according to which the transmitter sends out a synchronising signal to hold the receiver in step with it, and all of them introduce an element of some complexity, since they require that this signal should be separated from those corresponding to the picture modulations. On the other hand, if both the transmitter and receiver are fed from the same alternating current network, synchronism can be automatically established, subject to the existence of a phasing control which will restore any casual displacement of the picture from its correct position. It is uncertain whether all the

supply broadcast all over the country as a 50 c/s modulation of a radio wave and accurately controlled by a high quality tuning fork or astronomical clock. The frequency band required by this signal would be negligible, and it could be used for direct control of electric clocks or television apparatus, in places where no mains supply was available, and also for regulating the frequency of all sections of the "grid system." It is, of course, unnecessary and undesirable to use an ultra-short wavelength for such a "master wave"; the question as to what wavelength should be employed is an entirely open one, and might be decided simply from the standpoint of what was available for use.

**Standard of Detail**

Returning to the consideration of the researches of the German Post Office, the main decision, namely, that of the degree of detail required, was arrived at experimentally by the production, using purely optical means, of a series of films having different numbers of "picture points." Horizontal scanning was adopted, i.e., in terms of the "book" analogy, referred to last week, exactly corresponding to an ordinary book. The number



Baron Manfred von Ardenne, an early investigator of television in Germany, and a pioneer of the cathode ray system. In this recent picture he is seen with his latest apparatus employing what is known as the "speed-modulation" system.

alternating current networks in the Central Electricity Board's "grid system" will operate synchronously at all times, but at any rate there is a compelling argument in favour of close regulation owing to the very general use of electric clocks driven synchronously from the mains. Perhaps the slightly greater precision necessary for television purposes might be attained by the provision of a master frequency

of lines was varied in the different films, and the graduation along the lines was made finer in detail as the number of lines was increased, the results being made to conform exactly with what would be obtained in a series of ideal television systems in which scanning was carried out in a manner corresponding to each film.

As would be expected, an improvement in the picture detail was obtained which

**Television Progress—**

was very marked as the number of lines was increased from 30 upwards, but which became less effective after a certain standard of detail had been achieved. The conclusion was that 90 lines and 10,000 picture points represented a degree of detail which was sufficient for practical purposes, and that a closer analysis only gave a "diminishing return" by way of improvement.

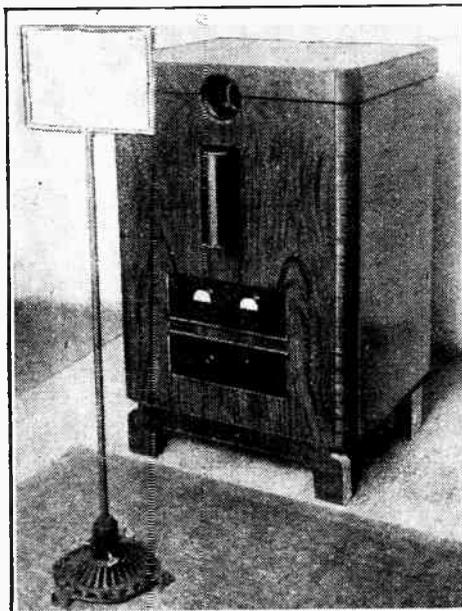
**One System or Many ?**

From the standpoint of television in this country we have now to consider the question as to whether any standardisation of television transmissions is possible, and, if so, what the nature of the transmissions should be. It is obvious that standardisation is desirable; indeed, it is almost impossible to imagine the alternative situation, where the B.B.C. puts into operation, either in succession or even simultaneously, systems of transmission of a proprietary character designed expressly to work in conjunction with receivers of specific origin. The matter would seem to be one in regard to which the B.B.C. should take great care, since, setting aside the danger of the commercial advantage passing into one set of interests, it is too early to say yet on what lines the future development of television will lie, and it would benefit neither the public nor the industry if a premium were prematurely put upon any one of the many methods of operation that have been advocated.

The alternative to the B.B.C. acting as the only source of transmissions would be for experimental television transmitting licences to be granted by the Postmaster-General to various commercial companies developing television and to amateur experimenters so that the relative merits of a number of schemes could be tried out in practice before the B.B.C. was committed to a service.

There is no doubt that the inauguration of a television broadcasting service on short wavelengths, with increased detail

in whatever measure is considered desirable, would cause an enormous awakening of interest in the whole subject and might, in fact, mark the starting point of industrial developments of the greatest importance. In this situation we look to the Corporation to take the broadest possible view, and, in the light of experience in Germany and elsewhere, and if it sets up,



The Mihaly television receiver shown at the recent Radio Exhibition in Berlin. This system employs a stationary mirror drum, with a rotating reflecting mirror, and an external screen on which the picture is projected. The system was described in the issue of *The Wireless World* of September 15th, 1933.

under its own auspices, a system of transmission it should be one which will allow the fullest possible scope to the endeavours of all sections of the industry. In particular, whatever else is decided, the question of synchronisation should be settled on a basis which is operative for any type of receiver, and in such a manner as to permit the use, wherever possible, of the 50 c/s controlled-frequency mains for synchronous operation.

the medium-wave band. Munich, Vienna, Budapest and Brussels No. 1 never fail to provide entertainment after dusk, and the last-mentioned can be received at any time when it is working. When Brussels goes up to 75 kilowatts the whole of this country should be definitely within its service area.

Brussels No. 2 is also well received, but this is not such a reliable daylight signal. It will also be using 75 kilowatts before long.

Heterodynes have been distinctly troublesome of late, many of the best stations having been affected at times. Luckily, such a thing as a persistent heterodyne night after night on a particular station rarely occurs; it is only now and then that interference is experienced. The choice, anyhow, is so wide nowadays that if one station is suffering there are plenty of others to be had clear of all interference. A programme that is specially attractive can often be received, even if the "parent" station is heterodyned, by tuning in one of the relays.

Specially good stations on the long waves are: Zeesen, Radio Paris, Warsaw and Motala. On the medium-wave band I can recommend Prague, Langenberg, Strasbourg, Heilsberg, Leipzig, Breslau, Katowice, Lyons Doua, Lwow and Beromünster. Fading is beginning to be troublesome below 300 metres for those who have not automatic volume control. D. EXER.

**The Radio Industry**

**T**HE Chronicle Wireless Annual," issued by the *Manchester Evening Chronicle*, is now in its eleventh year of publication; the latest edition which has just been issued is an extraordinary good shillingworth, packed with useful information for wireless amateurs. A number of constructional articles (with large-size wiring plans) are included, and modern developments such as Class "B" and Q.P.P. amplification are treated.

Much space is devoted to the present-day aspects of selectivity and quality, and, in addition, sections of the book are devoted to reference data and lists of stations.

Instructional courses in radio technique, especially prepared for the benefit of the would-be service engineer, are now beginning at the Northern Polytechnic, Holloway, London, N.7. Tuition is both practical and theoretical and full information can be obtained from the Organisers.

Atwater Kent radio products are to be distributed in Great Britain by the Portland Radio Co., Ltd., of 62, Bolsover Street, London, W.1.

Standard Telephones and Cables, Ltd., announce the introduction of an Acoustic Noise Meter. The new instrument is self-contained and portable and is operated by a single dry cell. It is calibrated in decibels.

The Technical and Commercial Radio College, of Lloyds Place, Blackheath, London, S.E.3, are conducting radio correspondence courses dealing with the various aspects of the subject.

The needs of students proposing to enter any branch of the industry are catered for; a descriptive brochure describing the activities of the organisation is available on application.

A new Tungstram valve, Type LD 210, has just been produced. This valve is for battery operation and is essentially designed to function as a detector, it being claimed that it is entirely non-microphonic.

A new type of screened valve holder, for Ostar-Ganz valves, similar to that illustrated in our issue of September 22nd, is now being manufactured by Lectrolinx, Ltd., of 79a, Rochester Row, London, S.W.1. The British-made version includes all the well-known features of Clix valve holders.

**DISTANT RECEPTION NOTES**

**T**HOUGH it is reported that Monte Ceneri is shortly to begin operating on its "Lucerne" wavelength of 257.1 metres, the station is now working again near the bottom of the long-wave band, using a wavelength of about 1,150 metres. It is interfering seriously with Kalundborg and making a nuisance of itself generally.

Other nuisances at the moment are Radio Vitus and Radio Agen. Both are off their proper wavelengths.

The new Lisbon 20-kilowatt station, to whose construction I referred some time ago in these notes, is nearly completed, and tests may begin at any time now. The wavelength will be 282 metres until the Lucerne Plan comes into force, after which the station will go up to 476.7 metres, sharing a wavelength with Skoplje, in Yugoslavia, and Trondheim.

Transatlantic reception continues to be remarkably good, and some of the South

American stations are better heard on certain nights than those in the United States. As readers may have some difficulty in obtaining particulars of South American stations, here is a list of some of the most important in the Argentine and in Mexico:—

	Metres.		Metres.
LS9 Buenos Aires	216	XED Renssa,	
LS8 " "	244	" Mexico	310.9
LS2 " "	252	XEO Mexico City	319
LR8 " "	261	XEW " "	329
LS5 " "	280	LR6 Buenos Aires	330
LR9 " "	291	LR5 " "	361
LR4 " "	303	XER, Villa Acunha	408

Nearly all of these stations use outputs of 10 kilowatts or more, and the great majority have already been received in this country. With a calibrated set stations are not difficult to identify, since announcements are made in Spanish. Be careful, though, not to be misled by small-hours' programmes from Madrid or Barcelona or Valencia!

From European stations very fine reception is now obtainable at the upper end of

The Wireless World

# FOREIGN PROGRAMME SUPPLEMENT



## SUNDAY

### OCTOBER THE FIFTEENTH

#### ALGIERS

824 kc/s, 364 metres; 13 kW.—8.2 p.m., Symphony Concert of French Music, conducted by Henry Defosse. In an interval at 7.45, News. 9.30, News. 9.35, Readings (Porto-Riche, La Fontaine and Victor Hugo). 9.55, News.

#### ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—8.30 p.m., Time Signal. 8.32, The Station Orchestra. 9.0, John McDonagh in Original Songs and Sketches. 10.0, Violin Solos by Alice Feeley. 10.15, Soprano Solos by Mme. Heffernan. 10.30, The Station Orchestra. 11.0, Time, News, Weather and Close Down.

#### BARCELONA

EAJI, 860 kc/s, 348.8 metres; 8 kW.—11.0 a.m., Chimes and Weather. 1.0 p.m., Gramophone Music. In the interval at 1.30, Theatre Notes. 2.0, Sextet Concert. 3.0, Programme for Hospitals and other Benevolent Institutions, with Gramophone Records. 4.0 to 5.30, Interval. 5.30, Agricultural Talk and Gramophone Music. 6.0, Concert by the Station Orchestra. 6.30, Song Recital by Enrique Alabert. 7.0, Music by the Station Orchestra. 7.30, Song Recital by Pepita Paulet. 8.0, Dance Music relayed from Hollywood Bar. 9.0, A Musical Comedy Selection on Gramophone Records. 10.45, Chess Lesson. 11.0 (approx.), Close Down.

#### BARI

1,112 kc/s, 269.8 metres; 20 kW.—9.0 to 9.45 a.m., See Rome. 9.45, Bible Reading. 10.0 to 11.0, See Turin. 11.30, See Rome. 11.45 to 1.0 p.m., See Turin. In the interval from 12.30 to 12.45, See Rome. 1.0 to 5.30, See Rome. 6.20, Talks and Gramophone Music in Honour of King Zog I of the Albanians. 7.0 (approx.) till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

#### BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—6.40 p.m., Vocal and Instrumental Concert. 9.0, Time and News. 9.15 (approx.), Cigány Music from the Dva Jelena Restaurant.

#### BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—5.30 a.m., To-day's Motto. 5.35 (approx.), Concert from Munich. 7.0, Agricultural Programme. 7.55, Chimes from the Potsdam Garrison Church, followed by Divine Service from the Village Church of Wittenau. 8.55 to 9.20, Interval. 9.20 (approx.), See Munich. 10.45, Weather Report. 11.0 to 1.0 p.m., Gramophone Concert. 1.0, Programme for Children. 1.30, Talk for Young People: Jahn, the Pioneer of the German Gymnastic Movement. 2.0, Ernst Leibl reads from his own Works. 2.30, Gramophone Concert of Classical Music. 3.0, Humorous Talk. 3.15, Talk on Max Stevigt, on his Sixty-Fifth Birthday. 3.30, Concert from Munich. 4.40, Rural Programme—Anecdotes and Stories. 5.10, Dialogue between Professor Senatra and Signora Alfi; German and Italian Opera. 6.0, See Munich. 7.0, See Leipzig. 7.30, See Stuttgart. 8.0, See Munich. 8.30, See Langenberg. 9.0, News. 9.45, Weather. 10.0, See Munich. 11.0 (approx.), Close Down.

#### BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—9.20 a.m. to 12 Noon, See Munich. 12 Noon, Das Gedicht einer Leidenschaft (Herbert Böhme), recited by the Author to Music by Hanns Naumann. 12.30 to 1.0 p.m., Concert of Light Music on Gramophone Records. 1.30, Play for Children. 2.15, Civilisation of Berlin. 2.30, Report of the Light Athletic Tournament from the

Karlshorst Race Course. 2.45, Orchestral Concert of Light Music. In the interval at 4.0, Radio Report from a Water Mill (on Gramophone Records). 5.0, Some Odd Characters—A Radio Sequence (Herbert Günther). 5.30, Italian Artists—Gramophone Concert. 6.0, See Munich. 7.5, Der Amtmann von Mainburg—Opera in Three Acts (Josef Snaga). 9.0, News. 9.15 (approx.), Dance Music from the Eden Pavilion. In the interval from 10.0 to 10.10, Topical Talk. 12 Midnight, Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

#### BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.45, Sports Talk. 8.0, Talk for Ex-Service Men. 8.15, Lottery Results. 8.20, Concert of Gramophone Music.

#### BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.55 p.m., Song and Violin Recital of Svoboda Music. 5.55, Talk for Housewives. 6.0, See Prague. 6.5, See Brno. 6.40, Concert of Popular Music by the Station Orchestra, conducted by Dyk. 7.30, See Moravská-Ostrava. 8.30, Bandonion Concert. 9.0, See Prague. 11.0 (approx.), Close Down.

BREMEN.—See Hamburg.

#### BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—9.20 a.m., See Munich. 10.45, Chamber Music on Gramophone Records. 11.0, Concert by the Station Orchestra, conducted by Topitz. 1.0 p.m., Agricultural Talk. 1.20, Talk: Wireless and Weather. 1.35, Reading (Selmidhonn). 2.0, Choral Concert from Waldenburg. 2.30, Programme for Children. 3.0, Concert by the Silesian Philharmonic Orchestra, conducted by Ernst Hoffmann. In the interval from 4.0 to 4.25, Radio Report from the Görnitz Garden City. 5.35, Talk: A Railway Station celebrates its Birthday. 6.0, See Munich. 7.0, See Leipzig. 7.30, See Stuttgart. 8.0, See Munich. 8.30, See Langenberg. 9.0, Time and News. 9.30, Dance Music from Berlin (Funkstunde). 12 Midnight, Close Down.

#### BRNO

878 kc/s, 342 metres; 35 kW.—11.15 a.m., Concert by the Brno Brass Band, conducted by Krenovsky. 12.30 p.m., Agricultural Programme. 12.45, Programme to be announced. 1.0, Interval. 3.0, Concert by the Station Orchestra, conducted by Janota; Soloist: Vlasta Kubikova-Janotova (Soprano). 4.30, Reading. 4.45, Gramophone Music. 5.0, German Transmission: Violin and Pianoforte Recital: La folia (Corelli); Largo (Vivaldi); Lullaby (Steiner); Serenade (Steiner); Spanish Dance (Falga). 6.0, See Prague. 6.5, Moravian Folklore Programme, relayed from Kosice, 1,022 kc/s (293 metres). 6.40, See Bratislava. 7.30, See Moravská-Ostrava. 8.30, See Prague. 10.0 (approx.), Close Down.

#### BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—10.0 a.m., Concert by the Small Station Orchestra, conducted by Leemans. 11.0, Mendel-

sohn Gramophone Concert. 12 Noon, Concert by the Radio Orchestra, conducted by Walpot. Soloist: Rosasco (Mouth Organ and Accordion). 1.0 p.m., Le Journal Parlé. 1.10, Programme by Mickey's Club Jazz Attraction. 1.30, La Muse de Bihochard—Sketch (Lauville). 1.40, Mickey's Club Jazz Attraction (contd.). 5.0, Dance Music relayed from the St. Sauveur Palais de Danse. In the interval at 5.30, Football Results. 6.15, Gramophone Music. 6.45, Sonata Recital by Mme. Hussen-Michaux (Pianoforte) and Frezin (Cello); Cello and Pianoforte Sonata (Boellmann); Dance for Cello and Pianoforte (Sevenants). 7.15, Religious Address. 7.30, Music Talk by Gilson. 8.0, Concert by the Radio Orchestra, conducted by Walpot. Soloist: Mme. Suzanne de Gavre (Songs). 8.40, Our Future—Faree in One Act (Peydeau). 9.0, Concert by the Station Symphony Orchestra. 10.0, Le Journal Parlé.

#### BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish. 10.0 a.m., Gramophone Concert. 11.0, Concert by the Small Station Orchestra, conducted by Leemans. 12 Noon, Concert by Mickey's Club Jazz Attraction, conducted by Ludo Langlois. 1.0 p.m., Journal Parlé. 1.10, Concert by the Radio Orchestra, conducted by Walpot. Soloist: Rosasco (Accordion). 5.0, Concert by the Station Symphony Orchestra, conducted by Meulemans. 5.30, Sports Results. 6.0, Modern English Music on Gramophone Records: Tintagel (Bax); Mediterranean (Bax); Dance (Scott); Miniature Suite (Coates). 6.30, Concert by the Small Station Orchestra, conducted by Leemans. 7.15, Religious Address. 7.30, See Brussels, No. 1. 8.0, Concert of Rhapsodies by the Station Symphony Orchestra, conducted by Meulemans: Rhapsody, Piet Hein (Anrooy); Clarinet Solo: Rhapsody (Debussy); Rapsodie dahoméenne (De Boeck); Rhapsody for Clarinet and Orchestra (Meulemans); Norwegian Rhapsody (Lato). 8.45, Humorous Programme. 9.0, Concert by the Radio Orchestra. 10.0, Journal Parlé.

#### BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Light Music and Romanian Music by the Jean Mareo Orchestra. In the interval at 5.0, Radio Journal. 6.0, Educational Programme. 6.20, Dance Music. 7.0, Concert by the Station Orchestra: Selection from Iphigenia in Aulis (Glück); Liebeslieder (Brahms); Ballet Music from Manon (Massenet). 7.40, Song Recital by Mlle. Zauriadescu, with Orchestral accompaniment: Arias from Don Giovanni (Mozart), and The Magic Flute (Mozart); Polonaise from Mignon (Thomas). 8.15, Concert (contd.): Roses of Florida (Fall); Gavotte (Popper); Military March (Saint-Saëns). 8.45, Radio Journal.

#### BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 7.0 p.m., till Close Down.—8.15 a.m., News. 9.0, Divine Service relayed from the University Church. 10.15, Evangelical Service, followed by Concert by the Opera House Orchestra, conducted by Ernest Dohanyi. In the interval, Radio Chronicle. 1.0 p.m., Gramophone Concert. 2.0, Agricultural Talk. 2.45, Radio Report from the Vintage in Tokay. 3.30, Talk. 4.0, Concert by the Eugen Pertis Cigány Band. 5.15, Humorous Programme. 5.45,

Programme to be announced. 6.45, Sports Notes. 7.0, Concert of Operetta Music by the Budapest Concert Orchestra, conducted by Polgar. 8.30, News. 8.45, Pianoforte Recital. 9.25, Concert by the Mándits Dance Band and the Béla Bodries Cigány Band, relayed from the Café Patria; Soloist: Gyula Szánthó (Songs).

CASSEL.—See Frankfurt.

#### COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—7.0 a.m., Gymnastics for Women. 7.15, Gymnastics. 8.0 to 8.30, Talk on Gardening. 9.0, Divine Service Relay. 10.30, Weather and News. 11.0, Town Hall Chimes. 11.2, Concert of Light Music by the Louis Preil Instrumental Ensemble. 12 Noon, Talk in English: The Grand Tour of Scotland. 12.20 p.m., Talk in German: On a Bicycle through Germany in 1933. 12.40, Talk in French. 1.0, Gramophone Concert. 1.30, Accordion Recital by Alex and Richard. 1.55, Programme for Children. 2.25, Wagner Concert from the State Broadcasting Building: The Station Symphony Orchestra, conducted by Nicolai Malko; Soloist: Lauritz Melchior (Tenor). 4.0 (also relayed on Skamlebaek, 31.51 metres), Divine Service Relay. 5.20, Talk: The American Worker. 5.50, Weather and News. 6.15, Time Signal. 6.30, Talk. 7.0, Town Hall Chimes. 7.2, Pianoforte Trio No. 3 in C (Haydn). 7.25, Folk Music and Folk Tales—Musical and Literary Programme: a Male Voice Choir (conducted by Rosenberg), and Missa Hellmers (Readings). 8.30, The Hansen Family—Humorous Episode (Locher). 8.45, News. 8.55, Operetta Music by the Radio Orchestra, conducted by Reesen. 9.50, Dance Music by the Otto Lington Band, relayed from the Ritz Restaurant. In the interval at 11.0, Town Hall Chimes. 11.30 (approx.), Close Down.

CORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

#### FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12.30 p.m., Programme in English by the I.B.C. 11.0 a.m., Happy Hour: Signature Tune; Overture, Il Seraglio (Mozart); Morning, from the Peer Gynt Suite (Grieg); Choir: Deep River (Traditional); Softly awakes my Heart, from Samson and Delilah (Saint-Saëns); Selection from Il Trovatore (Verdi); Choir: Swing low, sweet Chariot (Traditional); Hungarian Rhapsody No. 2 (Liszt). Part II, Organ Recital: Ca' cest Madrid (O'Henry); The White Dove (Lehar); The Organ Grinder; In a Chinese Temple Garden (Ketilbey); Weymouth Chimes (Lindahl); Il Bacio (Arditi); Signature Tune. 12.0 Noon, Variety Concert: Singing through Georgia; I'll never have to dream again; Then I'll be happy; Romance; Red Pepper Rag; How deep is the Ocean; Down in the Valley; Fit as a fiddle; I'm knee deep in Daisies; Somewhere a voice is calling; I'm in love with you; Deep in your memories; A pretty girl is just like a pretty dream. 12.30 p.m., Programme in French. 2.30 to 7.30, Programme in English by the I.B.C. 2.30, Orchestral Concert: March, Pride of the Wolfenrichs (Sousa); Dance of the Nymphs (Borch); Selection from The Chocolate Soldier (O. Strauss); Fairy Tale (Haykens); Quartet: Homing (del Riego); Voleta Medley (Varney); The Clatter of the Clogs (Flynn); Concert. Part I: America Calling (Pola); Back in the old Sunday School (Lord); Cowboy Joe; Minstrel Show of 1929. Part I: Here comes the Show Boat (Rose); I dreamt of you last night (Kálmán); Minstrel Show of 1931. Part I: Will you think of me? (Kálmán); Part II: Xylophone Solo; Squirrel Dance (Elliott-Smith); Yodelling Rag Man (Torrani); Pianoforte

OCT. 15th **SUNDAY** continued

Solo: Moon Song (Johnstone); Xylophone Solo: Dance of the Paper Doll (Tucker); Pianoforte Solo: Danzing Butterfly (Petkere); Song: You are too beautiful (Hart); Harp Solo: Aloha (Traditional); Negro Spiritual Medley. 4.0, Judge Rutherford's Address. 4.15, The Nursery Corner. 5.0, Military Band Concert: Marche Militaire (Schubert); Prælium (Järnefeldt); A Life on the Ocean (Binding); Parade of the Tin Soldiers (Jessel); Valse des Alouettes (Origo); Selection, The Pirates of Penzance (Sullivan); Amorettenzüng (Gungl); The Standard of St. George (Alford). 5.30, I.B.C. Members' Request Hour: Selection, Music in the Air; Song: You are my heart's delight (Lehár); Ocarina Solo: Under the Double Eagle (Tapiero); I do like to be beside the Seaside (Glover); Selection from Carmen (Bizet); The Blue Bird (Bordin); Song: I love the Moon (Rubens); Makin' Wicky Wacky down in Watikii (Hoffmann). 6.0, Light Orchestra Concert: Ginger Snaps (Bourdon); Pianoforte Solo: Magic Notes (Steingard); Cœur brisé (Gillet); In the Night (Tate); Selection from Wonder Bar (Katscher); Marching through Georgia (Wark); When the lilac blooms again (Rotter); Selection of Waltzes (Ancliffe). 6.30, Concert of Gramophone Records: Gracie Fields: How deep is the Ocean? (Berlin); Layton and Johnstone; It's Sunday down in Caroline (Syms); Paul Robeson: Wid de moon, moon, moon (Cook); Jack Payne: Oh Johanna (Lawrence); The Revellers: When Yuba plays the Rumba on the Tuba (Hupfeld); Stanley Holloway: Sam's Medals (Hogan); Debroy Somers: Selection from Give me a Ring; Jack Hulbert: The flies crawled up the window. 7.0, Orchestral Concert: Rakoczy March (Berlioz); Ballet from the Petite Suite (Debussy); On the Edge of the Lake (Coates); Dance of the Sylphes (Berlioz); Polonaise in A major (Chopin); Witches' Ride (Puccini); Morning from the Peer Gynt Suite (Grieg); Concert Waltz in D (Glazounov). 7.30 to 9.0, Programme in French. 9.0 till Close Down. Programme in English by the I.B.C. 9.0, Ballito Concert of Dance Music: Signature Tune, Happy Feet; Isn't it heavenly? (Meyer); Tiek Tock (Vienna); From me to you (King); Nobody's Sweetheart (Kahn); He was only a poor musician (Schwarz); Avalon (Rose); Let's all be happy together (Thomas); Goodnight but not Goodbye (Roberts); Signature Tune, Happy Feet. 9.30, Talkie Time. Signature Tune, Sittin' in the Dark; Selection from Il est Charmant (Moretti); Mrs. Bartholomew (Ellis); There'll still be love (Marvel); Live, laugh and love (Heymann); A nous la Liberté (Auric); In the Moonlight (Kelman); I've found the right girl (Lupino); Selection from The Kid from Spain (Kalmar); Signature Tune. 10.0, Accordion Band: Whistling Waltz (Reeves); C'est un petit nid (Ebbinger); Waltz, Morella (Charlier); Song: Down in the Valley (Harrington); La Javanette (Bozi); Annette (Phillips). Song: Having a Good Time (Pain); J'aime la Musique (Parsons). 10.30, Concert of Dance Music: Lazybones (Mercer); Wedding of the Dragonflies (Myers); Happy as the day is long (Arlen); Sing another line (Robinson); Trouble in Paradise (Schwarz); 'Twixt the devil and the deep; Blue Cloud (Hargreaves); Five-Fifteen (Hall); My Moonlight Madonna. 11.0, Variety Concert: Signature Tune, Happy days are here again; It's Sunday down in Caroline (Syms); Lazybones (Mercer); Reflections in the Water (Loeb); I always keep my girl out late (Abraham); My Gypsy Rhapsody (Lawrence); A Girl like Nina (Hammerstein); Let's Call it a Day (Brown); Signature Tune, Happy Days are here again. 11.30, Concert by the I.B.C. (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Signature Tune, Come back to Erin; Overture Medley (arr. Peters); In Pierrette's Garden (Clifton-Brooks); A good old Irish Step; Columbine (Garland); Song: Nirvana (Adams); Liebesfreud (Kreister); Pizzicato from Sylvia (Delibes); Selection from Die Fledermaus (Joh. Strauss); Signature Tune, Come back to Erin. 12.5 a.m. (Monday), News Bulletin in English. 12.10 (approx.). Club Concert for Shermess Listeners: Signature Tune, The Chum Song; My Gypsy Rhapsody (Lawrence); Under a Blanket of Blue (Syms); A Woman should stick to her Man (Ilda); Learn to croon (Coslow); At the Old Pig and Whistle (Butler); I can't remember; There's a Cabin in the Pines; I wish I had Wings; Someone stole Gabriel's Horn; Have you had a good Day to-day?; My first Love to last; Hold me; Adorable; Signature Tune. 1.0, Dance Music: Signature Tune, Bells of Normandy; Somebody stole my Gal; I cover the Waterfront; That's what Life is made of; I raised my Hat; The Shadow Waltz; This lovely Rose; One tiny Tear; Hiawatha's Lullaby; Sweep; My! oh, My; You don't understand; Something came and got me in the Spring; Peter, Peter; Little Miss Muffet; Pop Gun; Out in the Open; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

**FLENSBURG.**—See Hamburg.  
**FLORENCE.**—See Turin.  
**FRANKFURT**  
1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—9.20 a.m., See Munich. 11.0 a.m., Stahlhelm Demonstration. 12 Noon, See

Stuttgart. 12.15 p.m., Gramophone Concert of Light Music. 12.45, Talks arranged by the Wiesbaden Board of Agriculture. 12.55, Rural Programme—Talk. 1.30, See Langenberg. 2.30, Commentary from the Bird Sanctuary in Heiligoland. 3.0, See Langenberg. 5.0, Talk: The News Service. 5.30, Entfacte. 6.0, See Munich. 7.0, See Leipzig. 7.30, See Stuttgart. 8.0, See Munich. 8.30, See Langenberg. 9.0, Time and News. 9.20, See Stuttgart. 9.30 (approx.). Local News. 9.45, Light Music. 10.0, Concert of Light Music by the Station Orchestra, conducted by Hans Rosbaud. 11.0, See Stuttgart. 1.0 a.m. (Monday), Close Down.

**FREDRIKSSTAD.**—See Oslo.  
**FREIBURG.**—See Stuttgart.  
**GENEVA.**—See Radio-Suisse Romande.  
**GENOA.**—See Turin.  
**GLEIWITZ.**—See Breslau.  
**GOTEBORG.**—See Stockholm.  
**GRAZ.**—See Vienna.  
**HAMAR.**—See Oslo.

**HAMBURG**  
806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—9.55 a.m., Divine Service from the Cathedral in Lübeck, for the Opening of the National Artisans' Week. 11.15, Variety Programme from the Efa Palast. 11.55, Time and Weather. 12 (Noon), Concert by the Small Station Orchestra, conducted by Gerhard Maasz. 1.0 p.m., Programme for Children. 2.0, Guitar and Mandoline Recital. 2.30, Talk: Sparrow Hawks in Venezuela. 4.0, Wind Instrument Concert. 4.30, The Journey from Brunswick—Humorous Radio Play in Seven Scenes from the Book of Adolf Baron Knigge and Hugo Bartels. 5.30 (from Hanover). Programme by the Brunswick Provincial Theatre. 6.35, Sports Notes and Weather. 7.0, See Breslau. 9.0, News. 9.30, Review of Events in North Germany. 9.45, Programme from Berlin (Funkstunde).

**HANOVER.**—See Hamburg.  
**HEILSBURG**  
1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—11.0 a.m., Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner. Soloist: Ilonka von Ferency (Soprano). 1.0 p.m., Talk on Chess. 1.30, Stories for Young People. 2.0, Autumn—Play for Children (Ohrig). 2.40 (from Danzig), Police Band Concert. In the interval at 3.50, Sports Notes. 4.40, Talk: The Glamour of the Stage. 5.5, Folk Tales and Anecdotes. 5.30, Music by East Prussian Composers. 6.15, The Hunter and his Horn—a Talk, with Musical Illustrations. 6.45, Sports Notes. 7.0, A Musical Trip round the World—Concert by the Königsberg Opera House Orchestra, conducted by Erich Börschel. 9.0, News. 9.15 (approx.). Dance Music from Berlin (Funkstunde). 11.0 (approx.), Close Down.

**HILVERSUM**  
1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m., and 20 kW. from 5.40 p.m.—8.10 to 9.40 a.m., Programme of the Workers' Radio Society (V.A.R.A.). 8.10, Pigeon Flying and Football Report. 8.12, Horticultural Talk. 8.40, Organ Recital. 9.0, Gramophone Music. 9.20, Organ and Cello Recital. 9.40 to 10.10, Interval. 10.10 to 11.40, Programme of the Liberal Protestant Radio Society (V.P.R.O.). Divine Service Relay. 11.40 to 1.40 p.m., Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.). 11.40, Talk on Films. 12.10 p.m., Concert of Light Music by Hans Schindler and his Orchestra. In the interval: Music by a Male Voice Choir. 1.40, Weekly Book Talk. 2.10, Concert relayed from the Concertgebouw, Amsterdam. The Concertgebouw Orchestra, conducted by Pierre Monteux. Soloist: Samuel Dushkin (Violin). 3.40, Gramophone Music. 4.25, Sports Notes and Gramophone Music. 4.40 to 7.40, Programme of the V.A.R.A. 4.40, Programme for Children. 5.40, Orchestral Concert, conducted by De Groot. 6.30, The Adventures of Wakker and Tropicuit. 6.50, Concert (contd.). 7.40 till Close Down. Programme of the A.V.R.O. 7.40, Time and News. 7.55, Concert by the Wireless Orchestra, conducted by Albert van Raalte. Soloists: Helene Cals (Soprano) and Joseph Szajczi (Violin). Beethoven Programme: Coriolanus Overture; Two Songs: (a) Freudvoll and leidvoll, (b) Die Trommel gerührt; Violin Concerto in D. 8.50, Recitations. 9.10, Concert (contd.). Strauss Programme: Overture, The Gipsy Baron; Cardas from Die Fledermaus; Wiener-Blut; Polka, Tritsch-Tratsch; Frühlingsstimmen; Persian March. 9.55, Gramophone Music. 10.10, Concert of Light Music by Hans Schindler and his Orchestra. 11.10, Gramophone Music. 11.40 (approx.), Close Down.  
**HORBY.**—See Stockholm.

**HUIZEN**  
160 kc/s, 1,875 metres; 7 kW (until 3.40 p.m.). Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—8.10 to 9.10 a.m., Programme of the Christian Radio Society (N.C.R.V.). Divine Service. 9.10 to 4.40, Programme of the Catholic Radio Society (K.R.O.). 9.10, Gramophone Music. 10.10, High Mass from Breda. 11.40, Talk. 11.55, Concert by the Vienna Station Octet: Hail to the Spirit of Liberty (Souza); Red Roses (Lehár); Overture, Gri-Gri (Lincke); Elf Dance (Heykens); I hab a mal a Räuscherl g'habt (Kapeller); Selection from Tiedland (d'Albert); That naughty Waltz (Levy). 12.40 p.m., Talk. 1.0, Concert (contd.): Selection from The Geisha (Jones); An den Frühling (Grieg); Japanese Lantern Dance (Yoshitomo); Waltz, Wiener Blut (Strauss); Im Chambre separate (Heuberger); Finale. 1.40, Religious Address. 2.10, Orchestral Concert, conducted by Gerritsen. 2.40, Concert by the Volksadet Mixed Choir and the Breda Orchestra. 3.40, Orchestral Concert (contd.). 4.10, Programme for Hospitals. 4.40 to 7.25, Programme of the N.C.R.V. 4.40, Sacred Music on Gramophone Records. 5.10, Divine Service from Wemmel dingen, followed by Sacred Music. 7.25 till Close Down. Programme of the K.R.O. 7.25, Football Report. 7.30, Talk on the Work of the Missions to the Negroes, with Interludes by the Oosterhout Orchestra. 8.25, News. 8.30, Quartet No. 8 (Haydn) by The Hague Quartet. 8.50, Gramophone Music. 9.5, Quartet in D Minor (Schubert) by The Hague Quartet. 9.35, Gramophone Music. 9.50, News. 9.55, Concert by the Station Orchestra, conducted by Gerritsen: Overture, Undine (Lortzing); Ballet Music from Undine (Lortzing); Polonaise National Dance No. 1 (Schawenka). 10.20, Choral Epilogue. 10.40 (approx.), Close Down.  
**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**  
1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide and Sports Notes. 8.15, Radio Concert. 9.0, News. 9.15, Radio Concert. 10.0, Request Half-Hour. 10.30 till Close Down. Programme in English by the I.B.C. 10.30, Orchestral Concert. Selection from "Mother of Pearl" (O. Strauss); Ständchen (Schubert); Song: Roses at Dawning (Kahn); Waltz (Lincke); Chant sans paroles (Tchaikovsky); Song: Juanita (Norton); Roses from the South (Strauss). 11.0, Gramophone Music. Military Band: Le rêve passé (Krier); Sketch: Scenes of Domestic Bliss—Breakfast Time; Midnight; Orchestra: The Musical Clock of Madame Pompadour (Noack); Organ Solo: Drifting down the Shalimar (Monaco); Song: The Leader of the Town Brass Band (Longstaffe); Pianoforte and Organ Duet; Mari-gold (Mayer); Orchestra: Melodious Memories (arr. Fimck). 11.30, Instrumental Music. Orchestra: Jollification (Reeves); Pianoforte Solo: Selection from Bow Bells (Sullivan); Violin Solo: Le Balcon (St. Denis); Xylophone Solo: The Skaters' Waltz (Waldteufel); Pianoforte Solo, with Celeste Accompaniment: Serenade (Heykens); Hawaiian Trio: When Work is through (Sherman); Accordion Band: Coal Black Mammy (Cliff); Bandonian Solo: Blaze Away (Holzmann). 12 Midnight, Dance Music. Standing on the Corner: I'm one of the Lads of Valencia; Look what you've done; Maybe I love you too much; Street of Dreams; Hold me; Love will find a Way; Piccininnie's Heaven; In the Valley of the Moon; Moon Song; Don't be late in the Morning; The Old Spinning Wheel; It's within your power; The Lady I love; Butterflies in the Rain; My Heart's to let. 1.0 a.m. (Monday), I.B.C. Good-night Melody and Close Down.

**KALUNDBORG.**—See Copenhagen.  
**KIEL.**—See Hamburg.  
**KLAGENFURT.**—See Vienna.  
**KOSICE.**—See Prague.  
**LAHTI**  
167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—4.59 p.m., Time and Weather. 5.10, Talk. 5.35, The Queen of Spades—Opera (Tchaikovsky), relayed from the Opera House.

**LANGENBERG**  
635 kc/s, 473 metres; 60 kW.—9.50 a.m., A Radio Sequence from the Works of National Socialist Writers. 10.30, Anecdotes about Musical Masterpieces—Talk with Gramophone Illustrations. 11.0, See Frankfurt. 12 Noon, See Stuttgart. 12.15 p.m., Musical Programme. 1.30, Programme for Children. 2.30, Talk on Chess. 2.45, Reading (Wilhelm Frobenmann). 3.0, Concert by the Augmented Orchestra, conducted by Kühn. Soloists: Pirro Sbrana (Baritone) and Paul Manel and Hans Haas (Pianoforte). 5.0, Reading (Otto Gmelin). 5.20, Gramophone Music. 5.40, Talk: Industry in the Village of Niederkall in the Eifel. 6.0, See Munich. 7.0, See Leipzig. 7.30, See Stuttgart. 8.0, See Munich. 8.30, Richard Strauss Concert.

9.0, Time and News. 9.20, See Stuttgart. 9.30 (approx.), News. 9.45 to 11.0, See Frankfurt. 11.0, See Stuttgart. 1.0 a.m. (Monday), Close Down.  
**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**  
769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—10.30 a.m., Dialogue in Commemoration of Felix Dahn. 11.0, Concert from Heilsberg. 1.0 p.m., Weather and Time. 1.5, The Programme of the Week. 1.25, Agricultural Notes. 1.35, Hallo, here is the Wireless Zoo. 2.10, Trio in B for Pianoforte, Violin and Cello, Op. 97 (Beethoven). 2.40, Talk in Honour of Gustav Frensen's Seventieth Birthday. 3.0, Variety Programme. 3.50, Concert by the Leipzig Symphony Orchestra, conducted by Theodor Blumer. Soloists: Johanna Barklin Blumer (Soprano), Max Krämer (Violin) and Alfred Patzak (Cello). 5.0, Reading from the Works of Josef Görres. 5.20, Farewell to Water Sports—Radio Report of the last Rowing Races on the Elbe. 5.40, Talk: Pioneers of the Nazi Race Policy. 6.0, Choral and Organ Recital of Sacred Music from St. George's Church, Rottla. 6.30, Stages which mirrored the World—Tales of the Old German Court Theatres. 7.0, Mozart-Reger Music by the Symphony Orchestra, conducted by Fritz Weisbach: Overture, Idomeneo (Mozart); Variations on a Mozart Theme (Reger). 7.30, See Stuttgart. 8.0, See Munich. 8.30, See Langenberg. 9.0, News. 9.15 (approx.), Programme to be announced. 10.0, Dance Music Relay. 11.0 (approx.), Close Down.  
**LINZ.**—See Vienna.

**LUXEMBOURG**  
352 kc/s, 1,191 metres; 200 kW.—12.0 Noon, Concert by the Radio Orchestra, conducted by Henri Pensis: Overture, Anaëron (Cherubini); Selection from Le Postillon de Longjumeau (Adam); Dolce Melodia (Cataldi); Ballet Suite from Sylvia (Delibes); The Clock is playing (Blauau); March, El Capitan (Souza). 1.0 p.m., Gramophone Music. 7.0 till Close Down. English Evening. 7.0, Gramophone Concert: Brigg Fair (Delius); In a Summer Garden (Delius); Enigma Variations, Op. 36 (Elgar). 8.0, Concert by the Radio Orchestra; Soloist: Carl Delselt (Pianoforte); Pianoforte Concerto in E Flat—The Emperor (Beethoven); Les Préludes (Liszt). 8.50, News in French. 9.0, Popular Music by the Radio Orchestra: Selection from The Maid of Artois (Balfe); Selection from Maritana (Wallace); Waltz, The Wedding of the Winds (Hall); Dreaming (Haydn-Wood); Dance of the Merry Mascots (Kretzberg). 9.45, News in German. 9.55, English Songs on Gramophone Records. 10.15, Dance Music on Gramophone Records.

**MADRID**  
**ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Concert of Popular Music. In the interval at 10.45, Humorous Talk. 11.35, Talk. 11.45, Light Music. 12 Midnight-12.30 a.m. (Monday), Programme in English by the I.B.C.: Concert by the International Broadcasting Company (Ireland): Signature Tune, Come back to Erin; The Regiment of Peace; Yes, Mr. Brown; The Blue Danube; I love you; Hawaiian Sunset; I may be wrong, but I think you are wonderful; Marta; That's my Home; Signature Tune: Come back to Erin. 12.30, I.B.C. Goodnight Melody.**

**MADRID**  
**EAJ7, 707 kc/s, 424.3 metres; 2 kW.—8.0 to 9.0 a.m., Topical Review. 11.30, Municipal Band Concert from the Retiro. 2.0 p.m., Chimes, Time, Theatre Notes, and Popular Concert. 4.0, Interval. 7.0, Chimes, Radio Journal, and Dance Music. 8.30, Interval. 9.30, Chimes, Time, and Variety Programme with Woino Wischnewsky (Tenor). 12 Midnight, Chimes. 1.0 to 2.0 a.m. (Monday), Programme in English by the I.B.C. Dance Music. Lovey; I've told every little Star; It's Sunday down in Caroline; Ding, Dong, Ding; We belong together; 13th December Stomp; I've found the right girl; Climbing up the golden Stairs; Down in the Valley; Hold me; Headin' for a Wedding; Let's call it a Day; Tiek Tock; Isn't it heavenly; Morella Waltz; Let him live. 2.0, I.B.C. Goodnight Melody and Close Down.  
**MALMO.**—See Stockholm.  
**MILAN.**—See Turin.**

**MORAVSKA-OSTRAVA**  
1,137 kc/s, 263.8 metres; 11 kW.—9.30 a.m., Reading of Moravian Ballads, with Introductory Talk. 10.0, See Prague. 11.15, See Brno. 12.30 to 2.0 p.m., See Prague. 3.0, See Brno. 4.30, See Prague. 6.5, See Brno. 6.40, See Bratislava. 7.30, Hunting-Variety Programme. 8.30, Programme of Dance Music. 9.0, See Prague. 10.0 (approx.), Close Down.

**MOSCOW**  
**TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather Forecast 1.45 p.m., Weather. 2.0, Talk. 3.30, A Sketch (Zostchenko) followed by Reading from Stanislavsky's Memoirs. 4.30, Talk: Science and Technics. 5.30, Relay of a Play (Glicser) with Music by Trojanov. 8.0, News. 8.30, Programme Announced.**

OCT. 15th **SUNDAY** continued

ments, 8.55, Chimes, 9.5, Press Review, 10.0, Weather.  
**MOTALA.** See Stockholm.  
**MUHLACKER.** See Stuttgart.  
**MUNICH**  
 563 kc s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc s, 560 metres; and Nurnberg, 1,256 kc s, 239 metres.—9.20 a.m., Laying of the Foundation Stone for the Home of German Art. Address by Hitler. 10.45, Military Band Concert.  
**12 Noon.** Time and Programme Announcements. 12.16 p.m., Talk: Church Festivals. 12.30, Talk with Gramophone Illustrations. 1.30, Chess Lesson. 2.0, Spanisches Liederspiel Song Cycle (Schumann). 2.30, Programme for Children. 3.0, Reading (Nietzsche). 3.20, Concert conducted by Erich Kloss. 4.40, German Art Day—A Radio Sequence. 5.40, Vocal and Instrumental Concert. 6.0, An Artists' Festival at Isar-Athen—Firing of Salvoes and Report on the Artists' Procession. 7.0, See Leipzig. 7.30, See Stuttgart. 8.0, Wagner Concert by the Symphony Orchestra, conducted by Franz Adam. 8.30, See Langenberg. 9.0, Time and News. 9.15 (approx.), Programme to be announced. 10.0, Serenade.  
**NAPLES.** See Rome.  
**NOTODDEN.** See Oslo.

**OSLO**  
 277 kc s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc s, 368.1 metres; Hamar, 522 kc s, 574.7 metres; Notodden, 671 kc s, 447.1 metres; Porsgrund, 662 kc s, 453.2 metres; and Rjukan, 671 kc s, 447.1 metres. 9.15 a.m., News and Weather Report. 9.20, Chimes and Divine Service. 3.0 p.m., Gramophone Concert of Music by Mendelssohn, Wagner, Rachmaninov, Leoncavallo, Comperin, Verdi, Carl Bohm, de Curtis, and Beethoven. 4.0, Venner: Play in Three Acts (Arnulf Overland). 5.30, Talk: A Visit to Western Norway, relayed from Bergen, 824 kc s, 364 metres. 6.15, Weather and News. 6.30, Talk: Before the Elections. 7.0, Time Signal. 7.1, Concert by the Station Orchestra. 8.35, Sports Notes, Weather and News. 9.0, Topical Talk. 9.15, Variety Programme. 10.0, Dance Music on Gramophone Records. 11.0 (approx.), Close Down.  
**OSTERSUND.** See Stockholm.

**PALERMO**  
 558 kc/s, 537.6 metres; 3 kW. 9.25 a.m., Bible Reading. 9.40, Sacred Music. 10.5, Agricultural Talk. 11.45, Giornale Radio. 12 Noon to 1.0 p.m., Light Music. In the interval at 12.30, Time, Announcements and Weather. 4.30 to 5.30, Gramophone Music. 7.0, Dopplavoro Announcements and Giornale Radio. 7.20, Gramophone Music. In the intervals at 7.25, Sports Notes, and at

7.30, Time and Announcements. 7.45, Symphony Concert, conducted by La Rosa Parodi; Soloist: Mamino (Pianoforte); Overture to a Comedy (Renato Parodi); Concerto Campanella for Piano-forte and Orchestra (Pouleny). In the interval, Talk: Guy de Maupassant at Syracuse. Second Symphony in D (Brahms). After the Concert, Gramophone Music. 10.0 (approx.), Giornale Radio.

**PARIS**  
**POSTE PARISIEN,** 914 kc s, 328.2 metres; 60 kW.—10.0 a.m., Gramophone Music. 10.20, Press Review. 10.30, Gramophone Music (contd.). 11.0, Concert by the Station Orchestra. 12.15 p.m., Sound Film Music on Gramophone Records. 12.45, Sponsored Programme. 12.50, Song Recital. 1.30, Gramophone Music. 2.0, Interval. 7.0, Le Journal Parle. 7.5, Sports Notes. 7.15, Gramophone Music. 7.30, Catholic Address. 8.0, Koubitzky on Gramophone Records. 8.30, Chopin and Liszt Gramophone Concert. 9.15, La Cinquantaine—Play (Court-line). 9.45, Concert. Soloists: Charlotte Danvia, Roger Treville and Laura Babes. 10.30, News.

**PARIS**  
**RADIO PARIS,** Call CFR. 174 kc/s, 1,725 metres; 75 kW. 7.35 a.m., Gramophone Music. 8.0, Press Review and Weather. 8.30, Physical Culture. 12 Noon, Religious Address. 12.20 p.m., Sacred Music. Fantasia in C Minor (Bach); Pastorale (Buxtehude); Finale from the Second Symphony (Widor). 12.30, Gramophone Concert. Slav March (Tchaikovsky); Moorish Serenade (Chappi); Air and Dance (Scott); Aria from The Magic Flute (Mozart); Hungarian Rhapsody (Liszt); Spanish Dance (Granados); Selection from La Redemption (Franck); Ronde de l'Adieu de Laitia; The Ride of the Valkyries (Wagner); Parade of the Tin Soldiers (Jessel); Roses d'amour (Sabatier); Le Moulin de la Vierge (Blondina); Tango (Mahlereu); The Forge in the Black Forest (Ellenberg); Douce Endresse (Paradis). In the interval at 1.0, Exchange, News and Weather. 1.30 to 2.30, Programme in English by the I.B.C. 1.30, Gramophone Concert. Ambade pritanicre (Lacome); Chanson de la Esmeralda (Mozquita); Waltz, Les taqueurs (Waldteufel); Lettre à Manon (Gilbert); Eblouement (Ganne); Bouton d'or (Poeme); Adoration (Elipecci); Joyeux retour (Avignon). 2.0, Concert of Dance Music. Signature Tune; Happy Feet; Honey, what a pleasure; Best Wishes; Siboney; Somewhere in the World; Mary Rose; My

girl's such a good sport; Spanish Eyes; Happy Ending; Signature Tune; Happy Feet. 3.0 to 3.30, Programme in English by the I.B.C. 3.0, Orchestral Concert. Toreador Song from Carmen (Bizet); Selection from Rio Rita (McCarthy and Tierney); The Dancing Lesson (Olyer); Savoy Southern Memories (arr. Sumers). 5.30, Gramophone Music. 6.0, Popular Concert. 7.0, Concert of Light Music. 8.0, Radio Paris Music Hall. The Orchestra conducted by Maurice Andre. In the intervals at 8.30, News and Weather, and at 9.15, Press Review and News.

**PITTSBURGH**  
**KDKA,** 980 kc s, 306 metres; 50 kW. Relayed by W5XK on 48.86 metres and 25.27 metres.—7.0 p.m., Boys of Wyncocastle. 7.15 to 11.0, New York Relay. 7.15, Autumn Inyl. 7.30, Popular Programme. 8.0, National Opera Concert. 9.0, Gould and Shefter. 9.15, The Morin Sisters. 9.30, Organ Recital. 10.0, Vesper Services. 10.30, Grand Hotel, from New York. 11.0, Pathe News. 11.15, Weather and Sports Notes. 11.30, Happy Pelton's Orchestra. 12 Midnight, Vincent Lopez Orchestra, from New York. 12.30 a.m. (Monday). Programme to be announced. 1.0 to 2.45 a.m., New York Relay. 1.0, Light Opera Nights. 2.0, Guff Headliners. 2.30, Walter Winchell. 2.45, Marvellous Melodies. 3.0 to 4.0, New York Relay. 5.0, Mountain Music. 3.15, Fireside Memories. 3.30, Green Brothers' Orchestra. 4.0, Sports Notes and News.  
**PGRSGRUND.** See Oslo.

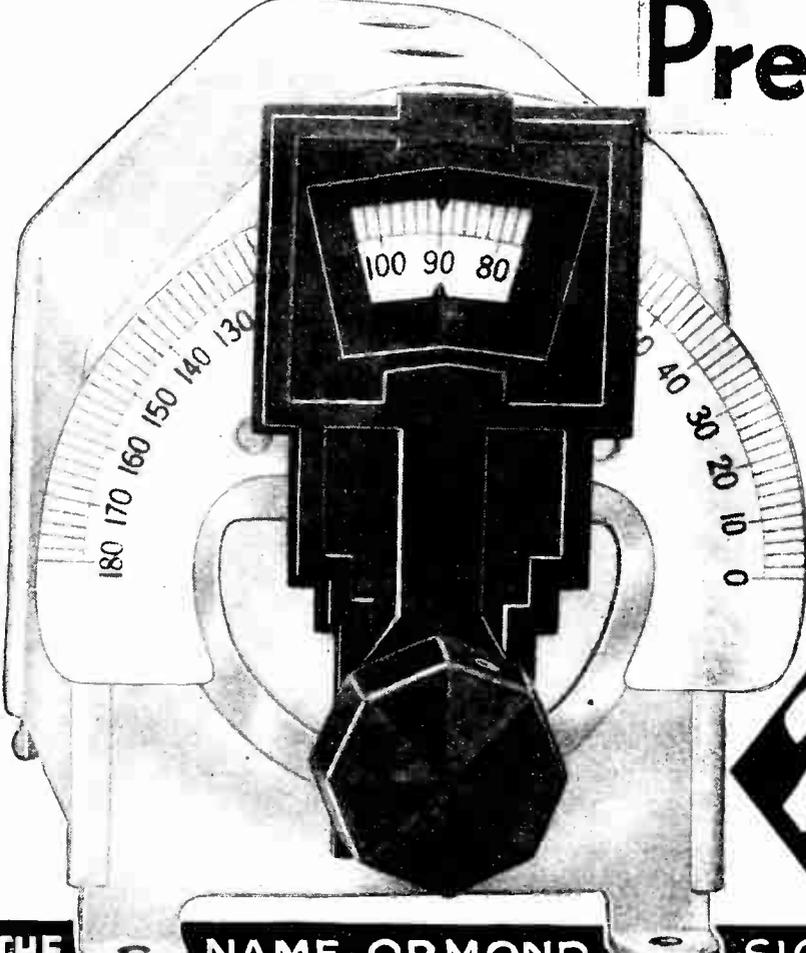
**PRAGUE**  
 614 kc s, 488.6 metres; 120 kW.—8.55 a.m., Quintet in E. Op. 12, for Violin, Cello, Clarinet, French Horn and Pianoforte (Fibich). 9.30, See Moravská-Ostrava. 10.0, Concert by the Station Orchestra, conducted by Jeremias; Recitations by Zdenek Stepanek. 11.0, Chimes. 11.5, News. 11.15, See Brno. 12.30 p.m., Agricultural Programme. 1.15 to 1.25, Announcements. 3.0, See Brno. 4.30, Reminiscences of the Theatre by the Blind Actor, Bohuslav. 4.45, Gramophone Music. 5.0, German Transmission; Music Review, followed by Recital of Medieval Songs in Honour of the Virgin Mary, by the German University Choir. Soloist: Schwarz (Tenor). After the Programme, News. 6.0, Time and News. 6.5, See Brno. 6.40, See Bratislava. 7.30, See Moravská-Ostrava. 8.30, Saxophone Solos. 9.0, Time and News. 9.28, Gramophone Music. 10.0 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**  
**SOTTENS,** 743 kc s, 403 metres, 25 kW.; and Geneva, 395 kc s, 760 metres.—8.55 a.m. (from Geneva). Chimes. 9.0 (from Geneva), Protestant Service. 10.0 (from Geneva), Gramophone Music. 11.30, News and Weather. 11.40 (from Geneva), Gramophone Music. 1.0 to 2.0 p.m., Interval. 2.0 (from Geneva), Light Music on Gramophone Records. 4.0 to 5.0, Interval. 5.0 (from Geneva), Gramophone Music. 5.20 (from Geneva), Religious Address. 5.50 (from Geneva), Organ Fantasia and Fugue—Ad nos ad salutarem undam (Liszt), relayed from St. Joseph's Church. 6.20 (from Geneva), Radio Chronicle and Sports Notes. 7.0 (from Geneva), Talk: The Countess of Noailles and her work. 7.30 (from Geneva), Cello Recital by Morel. 7.55, Concert by the Radio Suisse Romande Orchestra, conducted by Ehenard; Overture, The Black Domino (Amber); Waltz, Roses from the South (Joh. Strauss); Canzonetta (D'Ambrosio); Musette and Gavotte (d'Ambrosio); Le couvent (Pierné); Selection from Lohengrin (Wagner); Ballet of the Sylphs, Elini Minuet and Hungarian March (Berlioz). 9.0, News and Weather. 9.15 (approx.), Close Down.  
**RJUKAN.**—See Oslo.

**ROME**  
 Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc s, 319 metres; Milan (Vigentino), 662 kc s, (453.2 metres from 7.45 a.m.) and 2RO, 11,810 kc s, 25.4 metres from 4.15 p.m.—9.0 a.m., Sports Notes and Amusement Guide. 9.30, Agricultural Talk. 9.45, Bible Reading. 10.0 to 11.0, See Turin. 11.30, Musical Programme. 11.45 (approx.) to 1.0 p.m., See Turin. In the interval from 12.30 to 12.45, Sponsored Music. 1.0, Time and Announcements. 3.45 (Naples), Programme for Children, Weather and Sports Notes. 4.0, Sports Results. 4.15, Vocal and Instrumental Concert. 5.30, Weather. 6.30, Sports Notes, Dopplavoro Report and News. 6.45, Mezzo-Soprano Solos. 7.0, Time and Announcements. 7.25, Sports Notes. 7.45, Pianoforte Recital by Mario Cecchetti; Pastorale and Gavotte (Searlatt) Second Hungarian Rhapsody (Liszt). 8.0, Duets from the Second and Third Acts of Manon (Massenet), followed by Talk on Literature and Art. 8.50 (approx.), Gramophone Concert of Classical Music. Announcements in the interval. 10.0 (approx.), Giornale Radio and Close Down.  
**SALZBURG.**—See Vienna.

**SCHENECTADY**  
**WGY,** 791 kc s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.38 metres and by W2XAD on 19.56 metres.—7.0 to 8.45 p.m., New York Relay. 7.0, Gene Arnold and the Commodores. 7.15, Pop Concert. 7.45, Gems of Melody. 8.0, Wayne King's

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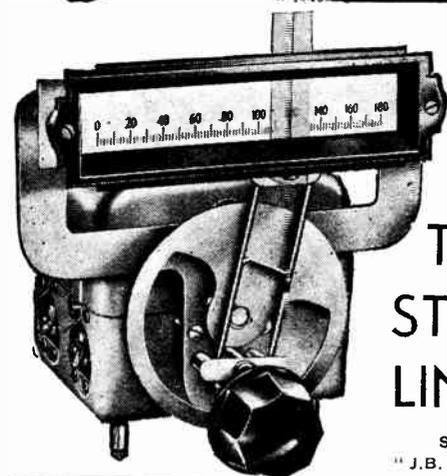
**SUNDAY** continued

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Orchestra. 8.30, Radio Pulpit. 12.45 to 3.45 a.m. (Monday), New York Relay. 12.45, Variety Programme. 1.0 a.m., Popular Programme. 2.0, Manhattan Merry-Go-Round. 2.30, American Album of Familiar Music. 3.0, Variety Programme. 3.30 Impressions of Italy. 3.45, Sunday at Seth Barkers, from New York, followed by Programme Resumé.

### SCHWEIZERISCHER LANDESENDER

**BEROMUNSTER**, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—9.0 a.m. (from Zürich), Protestant Service. 9.45 (from Zürich), Concert. 10.30 (from Zürich), Literary Programme. 11.0 (from Zürich), Gramophone Music. 11.30, Time, Weather and News. 11.40 (from Zürich), Operetta Music by the Radio Orchestra, conducted by Neppach. 12.30 p.m. (from Zürich), Programme for Peasants—Concert by the Heimelig Orchestra. 1.0 (from Zürich), Agricultural Talk. 1.30 to 3.0, Interval. 3.0 (from Zürich), Opera Music and Light Music on Gramophone Records. 4.0 (from Zürich), Recital of Popular Songs and Folk Songs by Walter Arnold. 5.0 (from Zürich), Chess Lesson. 5.30 (from Zürich), Chamber Music on Gramophone Records. 6.0 (from Zürich), Time and Sports Notes. 6.5 (from Zürich), Ballet Music on Gramophone Records. 6.20 (from Zürich), Talk in Dialect. 7.0 (from Zürich), Concert by the Radio Orchestra. 7.20 (from Zürich), Travel Talk: Holland. 7.50, News. 8.0, Report on the Disarmament Conference, relayed from Geneva. 9.20 (approx.) (from Zürich), Sports Notes and Close Down.

**SOTTENS**.—See Radio-Suisse Romande.

### STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—8.0 a.m., Provincial Programme. 8.30, Gramophone Music. 9.10, Talk for Workers. 9.30, Literary Talk, relayed from Malmö, 1,301 kc/s (231 metres). 10.0, Divine Service. 11.45, Weather. 2.0 p.m., Temperance Talk, relayed from Uppsala, 662 kc/s (453.2 metres). 2.30, Gramophone Music. 3.0, Elementary English Lesson. 3.30, Gramophone Music. 4.5 (from Sundsvall), Concert of Light Music; Tefting (Violin) and Hugo Noren (Songs). 4.30 Programme for Children, relayed from Halmstad, 1,391 kc/s (216 metres). 5.0, Divine Service. 6.15, Weather and News. 6.35, Concert by the Station Orchestra, the Station Choir and Soloists: Greta Söderman (Songs) and Astrid Berwald (Pianoforte). In the intervals, Sketch (Svensk) and Reading. 8.45, Weather and News. 9.0 (from Göteborg), Concert by the Kolisch String Quartet: Quartet in F (Ravel); Quartet in D (Mozart). 10.0 (approx.), Close Down.

### STRASBOURG

850 kc/s, 345 metres; 11.5 kW.—9.30 a.m., Orchestral Concert, conducted by Maurice de Villers. 10.45, Protestant Service. 11.30, Catholic Service in German. 12 Noon, Gramophone Concert of Classical Music. 12.45 p.m., News. 1.0, Time Signal. 1.1, Light Music on Gramophone Records. 2.0, Agricultural Talk. 2.15, Interval. 3.0, Symphony Concert by the Conservatoire Concert Society, relayed from the Paris Conservatoire. 5.0, Orchestral Concert, conducted by Roskam. 6.0, Medical Talk. 6.15, Sports Talk. 6.30, Chamber Music: Sonata for Horn and Pianoforte (Beethoven); Sonata for Two Pianofortes (Mozart); Sonata for Violin and Pianoforte (Brahms). 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German. Lottery Results and Announcements. 8.30, Alsatian Programme: Thomas Steltzer—Folk Play in Three Acts (Ernest Fuchs), with Incidental Music by Alphonse Gross. After the Programme, Press Review in French. 10.30, Dance Music, relayed from the Savoy.

### STUTTGART

**MUHLACKER**, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—9.45 a.m. (from Karlsruhe), Music of the Rocco Period—Vocal and Instrumental Concert. 11.0, See Frankfurt. 12 Noon, Topical Talk. 12.15 p.m., Foreign Melodies on Gramophone Records. 1.15 (from Freiburg), Agricultural Talk. 1.30, See Langenberg. 2.30 (from Mannheim), Palatinat Programme. 3.0, See Langenberg. 5.0 (from Karlsruhe), Das Erntewein—Play from a Tale by Carl Friedrich Wiegand. 5.40, Sports Notes. 6.0, Te deum (Edgar Tinell), relayed from St. Elizabeth's Church. 7.0, See Leipzig. 7.30, Schubert Concert by the Station Choir and Orchestra. 8.0, See Munich. 8.30, See Langenberg. 9.0, See Frankfurt. 9.20, You must know... 9.30, Local News. 9.45 to 11.0, See Frankfurt. 11.0, Serenade. 1.0 a.m. (Monday), Close Down.

**BUNDSVALL**.—See Stockholm.

### TOULOUSE

779 kc/s, 385 metres; 8 kW.—11.0 a.m., Dance Music. 11.30, Orchestral Music. 11.45, Airs from Operettas. 12 Noon, Military Music. 12.15 p.m., Arias from Opera. 12.30, Catholic Service. 12.45, Songs from Sound Films. 1.0, Amusement Guide and Market Prices. 1.5, Orchestral Music. 1.15, Songs. 1.30, Airs from Operettas. 1.45, Popular French Music. 2.0, Music by a Viennese Orchestra. 2.15, Agricultural Report. 2.30, La Bohème—Opera (Puccini)—Concert Version. 3.30, Orchestral Music. 3.45, Accordion Solos. 4.0, Popular Songs. 4.15, Military Music. 4.30, Violin Concerto (Tchaikovsky). 5.0, Dance Music. 5.45, Melodies by an Argentine Orchestra. 6.0, News. 6.15, Opéra-Comique Airs. 6.30, Airs from Operettas. 6.45, Sponsored Concert. 7.15, News. 7.30, Orchestral Concert. 8.0, Russian Songs and Balalaika Music. 8.15, Light Music. 8.30, Opéra-Comique Airs. 8.45, Two Steps. 9.0, Extracts from La fille et le garçon—Sound Film (Gilbert). 9.20, Music by a Viennese Orchestra. 9.45, Songs. 10.0, Accordion Solos. 10.15, North African News. 10.30, Concert for Listeners in Morocco. 11.0, Music by an Argentine Orchestra. 11.15, Light Music. 11.30, Songs from Operettas. 11.45, Orchestral Pieces. 12 Midnight, News. 12.5 a.m. (Monday), Hawaiian Guitar Music. 12.15, Cinema Organ Music. 12.30 (approx.), Close Down.

**TRONDHEIM**.—See Oslo.

### TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—8.40 to 8.55 a.m., Giornale Radio. 9.40, Agricultural Talk. 10.0, Mass from the Church of the Annunciation. Florence. 11.0 to 11.15, Religions Address. 11.30, Gramophone Music. 11.45, Sponsored Music. 12.0 Noon, Time and Announcements. 12.2 p.m. (approx.) to 1.0, Orchestral Concert, conducted by Tito Petralia. 3.0, Gramophone Music. 4.0, Concert of Variety Music. In the intervals, Football Results and Sports Talk. 5.0, Sports Notes. 5.15, Weather and Gramophone Music. 6.0, Time, Football Results, Popolavoro Announcements and Gramophone Music. 6.15, Gramophone Concert. 7.0, Announcements and Sports Notes. 7.30, Transmission of an Opera. In the intervals, Talk, Theatre Notes and Giornale Radio.

### VIENNA

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—10.0 a.m., Radio Report of the Unveiling of the Ziehrer Home. 10.30 a.m., Unveiling of a Memorial to the Fallen, on the Thirtieth Anniversary of the Cadet School, relayed from Traiskirchen. 11.30, Orchestral Concert, conducted by Weirich. Soloist: von Reuter (Violin). 1.30 p.m., Time and Weekly News Review. 1.45, Agricultural Talk. 2.5, Review of Books. 2.30, Concert by the Wiener Symphoniker, conducted by Josef Holzer. Soloist: Jaro Schmied (Violin). 2.45, Commentary on the Count Kalman Hunyadi Races from the Kriean. 3.15, Concert (contd.). 4.30, Talk: On American Railways. 4.55, Pianoforte Trio, in E Minor (Reger). 5.40, Gustav Festeberg reads from his own works. 6.10, Talk: Reminiscences from the Life of a Singer. 6.50, Hugo Wolf Song Recital by Rose Walter (Soprano). 7.30, That is Love—a Radio Potpourri. 9.0, News. 9.15, Dance Music on Gramophone Records.

### WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Programme Announcements. 11.10, Weather. 11.15, Tchaikovsky Concert by the Philharmonic Orchestra: Soloist: Kochanski (Violin). In the interval at 12 Noon, Talk: Safety First in the Factory. 1.0 p.m., Agricultural Talk. 1.15, Agricultural Prices. 1.20, Gramophone Records. 2.0, Veterinary Talk. 2.20, Concert by the Arcadius Bukin Quintet. In the interval, Announcements. 3.0, Programme for Children, relayed from Cracow, 959 kc/s (312.8 metres). 3.30, Song Recital on Gramophone Records. 3.45, Reading. 4.0, Talk for Women. 4.15, Popular Programme, relayed from Katowice, 734 kc/s (408 metres). 5.0, Programme to be announced. 5.40, Song Recital, relayed from Poznan, 896 kc/s, (335 metres). 6.5, Miscellaneous Items. 6.25, News. 6.30, Weekly Review for Young People. 6.45, Programme announcements. 6.50, Radio Journal. 7.0, Concert by the Station Orchestra, conducted by Nawrot. 8.0, Topical Talk. 8.15, Humorous Programme, relayed from Lwow, 788 kc/s (581 metres). 9.15, Sports Notes. 9.25, Dance Music from the Ziemianska Café. 10.0, Weather and Police Notes. 10.5, Dance Music (contd.).

**ZURICH**.—See Schweizerischer Landessender.

# MONDAY

## OCTOBER THE SIXTEENTH

### ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time, Weather, Stock Report, and Gramophone Music. 6.0, Programme for Children. 6.45, News. 7.0, Gaelic Talk. 7.15, Folk Tales. 7.30, Time Signal. 7.32, Acushla—by T. Madden and Company, with the Station Orchestra. 8.30, Violin Solos by Una Kenny. 8.45, Contralto Solos by Florence Howley. 9.0, Talk. 9.15, The Station Orchestra. 9.30 to 10.30, Programme by the I.B.C. (Ireland). Ltd. 9.30, Concert of Dance Music. Don't be Late in the Morning (Leclercq); In the Park in Parce (Rauinger); The Moment I saw you (Gay); Can't we meet again (Flanagan). 9.45, Octet Music. Hindu Song from Sadko (Rimsky-Korsakov); Cradle Song (Grieg); "Wireless World" Announcement; Violin Solo, Melodie (Kreisler); Mock Morris (Grainger). 10.0, Concert arranged by the International Broadcasting Company (Ireland). Ltd., on behalf of the Irish Hospitals Sweepstake Authorities. Don't be late in the Morning (Leclercq); Maria my Own (Lecunona); My Love Song (Burnaby); Racing Commentary; Sunny Madeira (Gilbert); The Whisper Waltz (Burke); Stormy Weather (Arden); Good-night but not good-bye (Micha). 10.30, I.B.C. Good-night Melody, followed by News and Weather. 10.40, The Columelle Cellidhe Band. 11.0 (approx.), Close Down.

### BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Tric Concert. Selection from Lilac Time (Schubert-Berte); Evening Song (Rabe); Spanish Serenade (Glazunov); Norwegian Dance No. 2 (Grieg); Barcarolle, Venetian Gondolas (Leemans); Minuet (Boccherini); Selection from Renzi (Wagner). 7.0, Request Gramophone Music. 7.15, Talk on Hygiene. 7.20, Sports Talk. 7.30, Exchange and Talk in Catalan. 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices. 9.5, Humorous Review of the Week in Verse. 9.15, Concert of Saranas. 10.0, Violin and Pianoforte Recital. 10.30, Catalan Radio Gazette. 11.0, News. 11.10 (approx.), Concert by the Station Orchestra. Overture, The Ruins of Athens (Beethoven); Suite, El secreto de Myrto (Berardi); Selection from Der Rosenkavalier (R. Strauss). 12 Midnight (approx.), Close Down.

### BARI

1,112 kc/s, 269.8 metres; 20 kW.—11.30 a.m. to 1.0 p.m., Concert by the Radio Quintet. 1.0, See Rome. 3.30, Gramophone Music. 1.10 (approx.) to 5.35, See Rome. 5.35, News in Albanian. 5.45 (approx) till Close Down, See Rome.

IASLE.—See Schweizerischer Landessender.

### BELGRADE

397 kc/s, 430.4 metres; 2.8 kW.—5.55 p.m., Time Signal. 5.56 (approx.), Concert by the Radio Orchestra. 7.0, Address. 7.30, Faust—Opera (Gounod) from the National Theatre. In the interval at 9.0, Time and News.

### BERLIN

DEUTSCHLANDSENDER (Reichssender), 83.5 kc/s, 1,635 metres; 60 kW.—11.5 a.m. (approx.), Gramophone Concert: Folk Song, Es ritzen drei Reiter zum Tor hinaus; Third Waltz Potpourri (Robrecht); Noch sind die Tage der Rosen (Baumgarten); Song, Es muss ein Wunderbares sein (Liszt); Overture, Donna Diana (Reznicek); Song from Der reine Jonathan (Müllacker); Two Alsatian 'easant Dances (Merklug); Wanderlieder-potpourri; Tarantella, La danza (Rossini); Valtz Melodies (Chopin); Selection from 'Armen (Bizet); Song (Tostl). 11.55, Time. 2 Noon, Interval. 12.45 p.m., News. 1.0, Gramophone Concert: Overture, Hans Heiling Marschner); Minuet (Boccherini); Waltzes Nos. 1, 2 and 15 (Brahms); Hungarian Dances Nos. 6 and 7 (Brahms); Minuet from the Divertissement in D (Mozart); Three Contredances (Mozart); Selection from Siegfried (Wagner); Selection from The Twilight of the Gods (Wagner); Ecosais (Beethoven); Waltz and Ballet Music from Faust (Gounod); Overture, Preciosa (Weber); Selection from La Bohème (Puccini). 2.0, Talk for Women. 2.30, Weather and Exchange. 2.45, Review of Das Kaiserbuch Paul Ernst). 3.0, Concert from Breslau. 3.0, Talk: The Future of the Education of Girls in Germany. 4.25, Unfamiliar Weber Music—Recital by Risa von Hesser (Songs), tolf Ermeier (Flute), Hans Schröder (Viola and Violin), Bruno Henze (Guitar), Peter Lehmann ('Cello), and Maria Ermeier-Lortzing (Pianoforte). Minuet for Flute, Viola and Guitar; Three Scottish Songs, with lute, Violin, 'Cello and Pianoforte: (a) Gewunderung, (b) Szene im Mondschein, (c) Im alten Ehepaar; Sicilian Romance for lute and Pianoforte; Three Scottish Songs: (a) Der fröhliche Soldat, (b) Das liebenswürdige und standhafte Mädchen, (c) Der Troubadour; Trio in G Minor for Flute, 'Cello and Pianoforte. 5.0, Poems. 5.5, Talk: Health Services in the Hitler Jugend Movement: Radio Report from the Berlin Charité—Speeches by the Minister of Health and others. 5.45, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, To-day's Motto.

7.5, Request Concert on Gramophone Records: Marching Song, Deutscher Föhn; The Blue Danube (Joh. Strauss); Giovinetta; Largo (Handel); Tarantella; Waltz from Coppélia (Delibes); Marie Louise (Meisel); Selection from Wild Violets (Stolz); Schöne Isabella von Castilien (Boetz); Ich hab' Dich einmal geküsst (Lehár); Song of the Toreador from Carmen (Bizet); Ultima Serenata (Magnani-Alfy); Badenweiler-Marsch (Fürst). 8.15, Cabaret Programme. 9.0, News. 9.15 (approx.), Dialogue: The Parachute. 9.45, Weather. 10.0, See Leipzig. 11.0 (approx.), Close Down.

### BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—3.30 p.m., Concert from the Zoological Gardens: Overture, Titus (Mozart); Poème (Fibich); Rose mousse (Bosc); Waltz, Fesche Geister (Ed. Strauss); Tarantella amorosa (Panizzi); Intermezzo, Vergissemeinnicht (Maebeth); Waltz, Nur einen Sommer laug (Kollo); Tango, A Hundred Thousand Women (Lesso-Valerio); Foxrot, Draussen in der Welt (Borgmann); Intermezzo, Narzissenmädlel (Siede); Potpourri, Wiener Volksmusik (Konzak). 4.30, Dialogue on Popular Melodies, relayed from a Café. 4.50, Reading by Hans Henning Baron Grote. 5.10, Violin Sonata in A Minor, Op. 105 (Schumann). 5.30, The Funkstunde informs its Listeners. . . . 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Lottery Announcements. 7.5, Genuins and Heredity—Literary and Musical Programme about the Bach Family, the Mozarts, Matthias Claudius, his Grandson, and his Great-Granddaughter, Richard and Siegfried Wagner, and the Strauss Family. Talk by Gottfried Bein: Talent can be bred, followed by a Discussion. 9.0, News. 9.15 (approx.), Dance Music from the Zoological Gardens. In the interval from 10.0 to 10.5, A Warning by the Chief of Police. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

### BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.30, News, Racing Results and Market Prices. 7.35, Talk: Bordeaux a Century ago. 7.50, Lottery Results. 8.0, Talk on Social Hygiene. 8.15, News. 8.30, Concert of Classical and Modern Music.

### BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.5 p.m., Song and Aria Recital by Marie Tauerová-Proskeová. Songs from Die tote Stadt (Kornold), The Force of Destiny (Verdi), Der Bettelstudent (Müllacker), Eva (Lehár), Schön ist die Welt (Lehár), A Kiss in Spring (Kálmán), Frederica (Lehár), Sissy (Kreisler). 4.40, Talk. 4.55, Sonata Recital by Náhlowsky (Violin) and Kafenda (Pianoforte). Sonata: No. 2 in D Minor (Schumann); Sonata in C Minor (Grieg). 5.55, Hints for Housewives. 6.0, See Prague. 6.10, Talk: Crime and Society, relayed from Kosice, 1,022 kc/s, 293 metres. 6.25, See Brno. 7.25, The School—Radio Comedy (Kosta Trifkovich). 8.0, See Brno. 9.0 till Close Down, See Prague. 9.15 (approx.), Close Down.

BREMEN.—See Hamburg.

### BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12 Noon, Gramophone Concert: March from Der Freikorporal (Volterthum); Waltz, Dorfschwalben aus Oesterreich (Jos. Strauss); Russian Fantasia (Benedict); Starry Night (de Micheli); Reminiscences (de Micheli); Gitarrenständchen (Lincke); Melodies from Mexico (Livschakov); Melody (F. Wolf); Nights in Naples (Zamecnik); Erbsen mit Speck (Wintermeier). 12.45 p.m., Time and News. 1.10, Song Recital by Anni Grosser-Klose (Soprano): Two Songs (Franz): (a) Im Herbst, (b) Willkommen, mein Wald. Three Songs (Schumann): (a) Widmung, (b) Au den Sonnenschein, (c) Ich wandre nicht. Three Songs (Brahms): (a) An die Nachtigall, (b) Botschaft, (c) Vergebliches Ständchen. Two Songs (Pfitzner): (a) Wie Frühlingsahnung, (b) Gretel. 1.35, Gramophone Concert: Overture, Banditenstreich (Suppé); Abschied von der Pusza (Jeno); Strahlende Augen (Pete); Kirchweih in Tyrol (Krome); Un peu d'amour (Silesu); Ständchen (Livschakov); March (Chabrier). 2.0, Market Prices. 2.15, Review of New Editions of Luther's Works. 2.35, Talk: The Wonder of the World. 3.0, Concert by the Station Orchestra, conducted by Rischka: Festival Overture (Leutner); Lyric Suite Nos. 1 and

2 (Grieg); Schubert Potpourri (Fetras); Invitation to the Dance (Weber); Gavotte (Schütt); Homage March (Liszt). 4.0, Talk. 4.20, Market Prices. 4.35 (approx.), Legal Talk. 4.45, Topical Talk. 5.0, Concert by the Station Orchestra, conducted by Rischka: Suite der Freude (Scheinpflug); Waltz, Die ersten Gedanken (Launer); Selection from Marike von Nymwegen (d'Albert); Musikalische Neckereien (Worch). 5.50, Meat Market Prices. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, News. 7.10, Symphony Concert from the Konzerthaus. The Silesian Philharmonic Orchestra, conducted by Hermann Behr. Soloist: Lore Hoffmann (Soprano): Suite in Old Style, Op. 93 (Reger); Two Hymns for Soprano and Orchestra, Op. 71 (Richard Strauss); Overture, Genoveva (Schumann); Three Pieces from The Damnation of Faust (Berlioz); Waltz, Morgenblätter (Job. Strauss). In the interval from 8.0 to 8.10, News. 9.0, See Munich. 9.20, Time and News. 9.45, Wireless Technical Talk. 9.55, Reading. 10.15 (approx.), Close Down.

### BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission: News and Reading. 6.0, See Prague. 6.10, Talk: Crime and Society, relayed from Kosice, 1,022 kc/s, 293 metres. 6.25, Radio Revue. 7.25, Reading. 7.40, Pianoforte Recital. 8.0, Judith—Cantata for Soloists, Choir and Orchestra (Honegger), relayed from the Stadium. 9.0, See Prague. 9.30 (approx.), Close Down.

### BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Acts I and II of Il Trovatore—Opera (Verdi) on Gramophone Records. 1.0 p.m., Le Journal Parlé. 1.10, Jazz Music on Two Pianofortes. 1.30, Gramophone Music: Sous bois (Staub); Scandinavian Dance (Runo); Selection from Louis XIV (Parès and Van Parys); Song of the Volga Boatmen (arr. Challapine); Selection from Ever Green (Rodgers); Spanish March, Granada (Garcia). 5.0, Variety Music by the Radio Orchestra, conducted by André. 6.0, Medical Talk. 6.15, Finale of The Valkyrie (Wagner) on Gramophone Records. 6.30, Violin Sonatas by Mme. Likoudy-Passet: Sonata No. 18 (Mozart); Sonata No. 3 (Bach); Sonata in F (Tcherepnina). 7.15, Gramophone Music: Overture, The Caliph of Bagdad (Boieldieu); La promenade en voiture (Alix); Hungarian Dance (Barthel); Minuet (Boëllmann). 7.30, Film Review and Theatre Notes. 8.0, Concert of Ballet Music by the Radio Orchestra, conducted by Franz André: Ballet Music from Faust (Gounod), Lakmé (Delibes) and The Damnation of Faust (Berlioz); Ballet Suite, La boîte à jousjou (Debussy); Extracts from Ceindrillon (Massenet); Ballet Music from Les deux pigeons (Messager). In an interval at 8.45, Reading (Brodcoerens). Extracts from La Guitarra (Pedrell). 10.0, Le Journal Parlé.

### BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—12 Noon, Gramophone Concert: Selection from Princess Charming (Waller); Waltz, Die Schönbrunner (Lanner); Honey-suckle (Mayerl); Selection from One Hour with You (Robin-Whiting-Strauss); Second Serenade (Heykens); Potpourri of Russian Gipsy Melodies; Tarantella (Coates); Selection from The Maid of the Mountains (Fraser-Simson); Mignonette (Mayerl); The Skaters' Waltz (Waldteufel); Puppenparade (Rathke); Selection from Louise (Charpentier). 1.0 p.m., Journal Parlé. 1.10, Extracts from The Barber of Seville (Rossini) on Gramophone Records. 5.0, Concert by the Station Symphony Orchestra, conducted by Kumps: Overture, Preciosa (Weber); Selection from Marouf (Rahaud); Extracts from La Captive (Gilson); Humoresque (Wambach); Suite in Old Style (Block). 5.45, Programme for Children. 6.30, Fourth Symphony (Tchaikovsky) on Gramophone Records. 7.12, News. 7.15, Talk and Sports Review. 7.30, Journal Parlé. 8.0, Extracts from The Mastersingers—Opera (Wagner) on Gramophone Records. 8.15, Extracts from Heime—Lyric Play (Jef Mennekens), with Introductory Talk. 8.45, Talk: Belgium's Fiscal Policy. 9.0, Concert by the Station Symphony Orchestra, conducted by Kumps: Waltz, The Blue Danube (Strauss); Ballad No. 2 (Pelemans); Valse bleue (Margis); Fête populaire from La Pacification de Gand (Beuot). 10.0 Journal Parlé.

### BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra. Overture, Fra Diavolo (Auber); Ballet Music from La Juive (Halévy); Slow Waltz from The Circus Princess (Kálmán); Russian Dance (Bullerian); Waltz (Prozavnik); Rondino (Sibelius); Paysage de France (Chantrier); Madrigalesca (Albergoni). In the interval at 5.0, Radio Journal. 6.0, Educational

Programme. 7.0, Pianoforte Recital by Mme. Zamfiresco. 7.30, Talk. 7.45, Old Romanian Songs by Mme. Iordanovici. 8.15, Concert by the Metzner Quartet. 8.45, Radio Journal. 9.0, Light Music relayed from a Restaurant

### BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 840 metres from 7.30 p.m. till Close Down.—4.30 p.m., Gramophone Concert. 5.30, German Lesson. 6.0, Concert by the Emmerich Magyar Cigány Band. 7.0, Programme of Poetry and Music. 7.30, The Ninth Symphony (Beethoven), by the Concert Orchestra, conducted by Erich Kleiber, relayed from the High School for Music. 9.25, News. 9.45 (approx.), Concert by the Karl Bura Cigány Band, relayed from the Ketter-Restaurant.

CASSEL.—See Frankfurt.

### COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Town Hall Chimes. 11.2, Concert by the Harald Andersen String Ensemble, relayed from the Hotel d'Angleterre. 1.0 p.m., Interval. 2.20, Talk for the Housewife. 2.30, Concert by the Radio Orchestra, conducted by Gröndahl. Overture, Jean de Paris (Boieldieu); Selection from the Music to a Play (Scalabrini); Waltz, Barcarolle (Waldteufel); Dance from Wayland the Smith (Henriques); Overture, Renaissance (Lange-Müller); March Fanfareklänge (Fück); Waltz, Pomona (Lunhye); Suite, Scenes napolitaines (Massenet); Icelandic Dance (Leifs); Caprice italien (Tchaikovsky). In the interval at 3.15 (approx.), Reading. 4.30, Exchange and Fish Market Prices. 4.45, Talk: The Little Entente. 5.15, Elementary English Lesson. 5.45, Weather. 5.54, Announcements for the Workers' Radio Society. 6.0, News. 6.15, Time Signal. 6.20, Discussion on Newspapers. 8.0, Concert by the Radio Orchestra, conducted by Mahler. Overture, Così fan Tutte (Mozart); Divertimento (L. Mozart); Three German Dances (Mozart); Overture, A Midsummer Night's Dream (Mendelssohn); Minuet and Serenade in D (Brahms); Waltz from Der Rosenkavalier (Strauss). 9.0, News. 9.15, Gramophone Music. 9.30, Concert of Chamber Music. Quintet for Pianoforte, Flute, Clarinet, Horn and Bassoon (Rimsky-Korsakov); Divertissement for Flute, Oboe, Clarinet, Horn, Bassoon and Pianoforte (Roussel). 10.0 (approx.), Close Down.

CORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

### FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C.: Happy Hour: Part I. Orchestral Concert: Signature Tune; Waltz, Très jolie (Waldteufel); Song, Throw open wide your Window (Calson); Pouçé valsante (Poldini); Reconciliation (Drigo); Now I'm in Love (Shapiro); Babes in Toyland (Herbert); Song, Love is King To-day; Siciliana (Schmalstich). Part II. Dance Music: Sweet Dreams, Pretty Lady; Carry me back to Green, Green Pastures; I always keep my Girl out late; With my Guitar and you; Let's call it a Day; Learn to croon; Adorable; Chewing Gum; Signature Tune. 12 Noon, Programme in French. 4.30 to 5.0 p.m., Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Concert for Children and Bognor Listeners: Signature Tune; The Night by the Sea; Beautiful Gillespie; Song, Letting in the Sunshine (Gay); All over Italy (Munroe); Song, That's my Home (Rene); Pianoforte Solo; Selection from The Desert Song (Romberg); Any Time, any Day, anywhere (Washington); Polly (Zamecnik); Rosa Mia (Guizar). 5.30, Orchestral Concert for Hastings and Eastbourne Listeners: Selection from Sari (Kálmán); Evolution of Dixie (Lake); Violin Solo: The Morning Dew (Traditional); Ay, Ay, Ay (Friere); Charming Episode (Ormandy); Violin Solo: Moment musical (Schubert); Singing a Song to the Stars (Meyer); Southern Rhapsody (Hosmer); Signature Tune. 6.0, Programme in French. 10.0 (approx.) till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune; Bells of Normandy; Tick Tock; A Woman should stiock to her Man; Sundown in a Little Green Hollow; Nobody's Sweetheart; At the Old Pig and Whistle; Waltzing in a Dream; It's Sunday down in Carolina; Isn't it Heavenly; Learn to croon; I raised my Hat; Lover; Sweetheart Darlin'; Oh! Johanna; I live for Love; Pink Elephants; Sweet Dreams, Pretty Lady; Signature Tune. 11.0, Tunes from the Talkies; Signature Tune; Sittin' in the Dark; The Good Companions; Tick Tock (Vienna); I've found the Right Girl; Old Talkie Gems; Everyone says I love you; One Little Drink; Pianoforte Solo: Selection from The King of Jazz; Learn to croon; Signature Tune. 11.30, Club Concert for Canterbury Listeners: Signature Tune; The Chum Song; Waltz from The Sleeping Beauty (Tchaikovsky); Intermezzo from Cavalleria rusticana (Mascagni); Scherzo from a Midsummer Night's Dream (Mendelssohn); Pilgrims' Chorus from Tannhäuser (Wagner); Idylle Bretonne (Gennin); Liebestraum (Liszt); Meditation

OCT. 16th **MONDAY** continued

from Thais (Massenet); Searf Dance (Chaminade). 12.5 a.m. (Tuesday), Late News Bulletin in English. 12.10, Club Concert, Part II: Little Lady; Shoo the Hoodoo away; My Heart's to let; I lost my Girl from Memphis; Will you dance through Life with Me; Signature Tune. 12.30, Dance Music: Let's call it a Day; From me to you; Meet me in the Gloaming; P.C. 123, The Policeman's Song; Reflections in the Water; Maybe I love you too much; Down in the Valley; Happy Ending. 1.0, Dance Music: Signature Tune; Bells of Normandy; Lazybones; Wedding of the Dragonflies; Let's all be happy Together; Spanish Sweetheart; Won't you stay to Tea?; The Dicty Glide; My Lucky Day; They all do the Rumba; It was a Night in June; Twelfth Street Rag; The Old Spinning Wheel; I always keep my Girl out late; Avalon; I cover the Waterfront; Dancing Butterfly; Peter, Peter; Little Miss Muffet. 2.0, I.B.C. Good-night Melody and Close Down.

**FLensburg.**—See Hamburg.

**Florence.**—See Turin.

## FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35 to 1.30, See Stuttgart. 2.30, Weather. 2.40, Time and Economic Notes. 3.0, Concert by the Station Orchestra. Soloists: Heinz Korte (Clarinet) and Gustav Jung (Bassoon). Part I. Conductor: Reinhold Merten. Symphony No. 3 in D (Schubert); Clarinet Concerto (Mozart); Twelve German Dances (Haydn); Bassoon Concerto (Fogg); Overture in D (Schubert). Part II. Conductor: Walter Caspar. Old Dance Music. 5.0 to 5.35, See Stuttgart. 5.35, Talk for the Housewife. 5.50, News. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Topical Talk. 7.10, Gala Concert, relayed from the Frankfurt Radio Exhibition. 9.0, News. 9.20, See Stuttgart. 9.30, News. 9.40 till Close Down. See Langenberg.

**Fredrikstad.**—See Oslo.

**Freiburg.**—See Stuttgart.

**Geneva.**—See Radio-Suisse Romande.

**Genoa.**—See Turin.

**Gleiwitz.**—See Breslau.

**Goteborg.**—See Stockholm.

**Graz.**—See Vienna.

**Hamar.**—See Oslo.

## HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m., Transmission for all German Stations, relayed from Munich. 7.0, Concert by the Philharmonic Orchestra, conducted by Eugen Papst, relayed from the Musikhalle. Soloist: Prof. Gustav Havemann (Violin); Symphonic Prologue to Oedipus Rex (Max von Schillings); Concerto in D Op. 61 (Beethoven); Symphony No. 7 in E (Bruckner). News in the interval. 9.0, News. 9.10 (from Kiel), Orchestral Concert, conducted by Hans Döring. Overture, Indra (Flotow); Selection from Undine (Lortzing); Selection from Mascarade (Nielsen); Potpourri, Wien bei Nacht (Komzak); Waltz, Marienklänge (Jos. Strauss); Two Pieces (von Blon): (a) Wellenspiel, (b) Traumweben; Dance of the Dervishes (Bendix); Selection from The Geisha (Jones); Waltz, Hesperusklänge (Gungl); Nactigallenständchen (Klose); March, Das neue Deutschland (Zimmer).

**Hanover.**—See Hamburg.

## HEILSBURG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 to 1.30 p.m., Operatic Concert on Gramophone Records: Overture and Aria from Aida (Verdi); Aria and Dance of the Priestesses from Aida (Verdi); Preludes to the First, Second and Fourth Acts of Carmen (Bizet); Flower Song from Carmen (Bizet); March and Ballet Music from Robert le Diable (Meyerbeer); Overture, Rienzi (Wagner). In the intervals at 12.20 and 1.0, News. 1.40, Handicraft Lesson for Boys. 2.0, Market Prices and Exchange. 2.30, Programme for Children. 3.0, Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Albin (Flotow); Scènes pittoresques (Massenet); Selection from Das Hofkonzert (Scheinplung); Waltz, Sohr las Olas (Rosas-Pachernegg); Gipsy Idyll (Perey); Brise de mer (Leoncavallo); Suite, The Merchant of Venice (Sullivan); Selection from Countess Maritza (Kálmán). In the interval at 3.50, Talk: Alfred Nobel. 4.50 (from Danzig), Talk: The Mission of the Danzig Press. 5.15, Market Prices. 5.20, Talk: Through the Baltic Countries to the Grave of Walter Flex. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, News and Weather. 7.10, Concert of Ballet Music by the Small Station Orchestra, conducted by Eugen Wilcken: Ballet Overture (Kremser); Selection from Sylvia (Delibes); Frau Luna (Lincke); Mabeth (Verdi) and Undine (Lortzing). 8.0, Concert by the

Danzig Theatre Orchestra, conducted by Erich Orthmann, relayed from the State Theatre, Danzig. Soloist: Dusolina Giannini (Songs). Aria: Sut queste sacro altare, from La Vestale (Spontini); Suicidio—Aria from La Gioconda (Ponchielli); Suite, Italia (Casella). 9.0, News. 9.20, Elementary English Lesson.

## HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m., and 20 kW. from 5.40 p.m.—11.40 a.m. till Close Down, Programme of the Workers' Radio Society (V.A.R.A.), 11.40, Concert of Light Music, conducted by Wins. 1.40 p.m., Interval. 2.10, Concert by the Little V.A.R.A. Orchestra, conducted by Hugo de Groot. In the interval at 2.40, Recitations. 4.10, Programme for Children. 4.40, Concert by De Filierfluiters, conducted by v.d. Horst. Soloist: de Booy (Songs). Schön ist das Leben (Heymann); Du, du, du (Stolz); Kleine Liebe grosse Liebe (Grothe); Butterflies in the Rain (Reaves); How deep is the Ocean? (Berlin); Going, going, going (Baxter); Yo-Yo (Nelson). 5.5, Organ Recital by Steyn: Please (Rainger); Organ from Drei alte Schachteln (Kollo). 5.15, Orchestral Concert (contd.): Bravo, bravo (Dostal); Extracts from Forty-second Street (Warren); I can't give you anything but Love (Fields); Under my Umbrella (Flynn-Meyer); Signorina (Jurmänn). 5.58, Organ Recital (contd.): Ninon, lach mir einmal zu (Jurmänn-Kaper); Bravo, bravo (Dostal). 5.50, Orchestral Concert (contd.): Waltz, The Blue Danube (Joh. Strauss); Play, Fiddle, play (Deutsch-Aitmann); Ninon, lach' mir einmal zu (Jurmänn); Lazy Bones (Carniehael); Moths around the Candle (Dolphe-Gordon); Kamerad, wir sind die Jugend (Solz). 6.10, Concert by the R.P.N. Trio, with Commemorative: Trio in B Flat No. 6 (Mozart); Trio (Voormolen); The Dumky Trio (Dvorak). 6.50 (in an interval), Book Review. 7.40, S.O.S. Messages. 7.42, News. 7.55, The Barber of Seville—Opera (Rossini). In the interval at 9.30, Dramatic Programme. 10.45, Gramophone Music. 11.40 (approx.), Close Down.

**Horby.**—See Stockholm.

## HUIZEN

160 kc/s, 1,875 metres; 7 kW. (until 3.40 p.m.). Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—Programme of the Christian Radio Society (N.C.R.V.),—11.55 a.m., Gramophone Music. 12.10 p.m., Organ Recital by Jan Zwart. 1.40, Broadcast for Schools. 2.15, Gardening Talk. 2.55, Dressmaking Lesson. 3.40, Bible Reading with Baritone and Organ Solos. 4.40, Recital by Mulder-Belser (Mezzo-Contralto). Wittpenn (Flute), and Hengeveld (Pianoforte); Ach, unansprechlich ist die Not (Bach); Flute Sonata (Amalia Princess of Prussia); Wonne der Wehnut (Beethoven); Die Trommel gerühret (Beethoven); Freudvoll und leidvoll (Beethoven); Etudes I and 6, Op. 37 (Böhm); Pianoforte Solo: Rhapsody in E Sharp, Op. 118 (Brahms); Ecoule la Symphonie (Dubois); Romance (Saint-Saëns); Novembre (Tremisot); Softly awakes my Heart, from Samson and Delilah (Saint-Saëns); Ballad in G Minor (Brahms); Intermezzo (Brahms); Herfststemmingen (Tieck Junior); Vondelkeens (Wiers); O Gulden Hood (Dyserinck). 6.10, Answers to Correspondence. 6.40, Police Notes. 6.56, Religious Report. 7.10, Answers to Correspondence. 7.40, Organ Recital by van den Kerckhoff: Prelude in B Minor (Bach); Prelude, Christ unser Herr zum Jordan kam (Bach); Concert Allegro in D Minor (Vivaldi-Bach); Prayer (Franck); Choral No. 3 (Andriessen) Carillon (Vierne); Divertissement (Reger); Kyrie eleison (Reger); Toccata (Reger). 8.40, Religious Address. 9.10, Baritone Song Recital by Ravelli: Per la gloria (Buononcini); Come raggio di sol (Caldara); Air (Bach); Serenade from Don Giovanni (Mozart). Gramophone Music: Songs (Schubert): (a) Who is Sylvia?, (b) Gruppe aus dem Tartarus, (c) Lachen und weinen, (d) Nacht und Träume, (e) An die Leier. Gramophone Music: Songs (Brahms): (a) Ruhe Süßliebchen, (b) O wüsst' ich doch den Weg zurück, (c) Feldeinsamkeit, (d) Botschaft. 10.10, News. 10.20, Gramophone Music. 11.10 (approx.), Close Down.

**Innsbruck.**—See Vienna.

**Kalundborg.**—See Copenhagen.

**Kiel.**—See Hamburg.

**Klagenfurt.**—See Vienna.

**Kosice.**—See Prague.

## LAHTI

167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—4.10 p.m., Harp Recital by Irma Lönnroth. 4.15, Talk. 5.15, English Lesson. 5.40, Talk. 6.5, Concert by the Radio Orchestra, conducted by Toivo Haapanen, relayed from the Conservatoire: Prelude and Fugue (Bach-Kalstenius); Symphonietta for Strings and Harp, Op. 27 (Graener); Variations, Op. 8 (Saeuerud); Lyric Suite (Palmgren); Con-

certino for Oboe, Clarinet and Trombone (Klami); Concerto, Op. 131, for Quartet and Orchestra (Sporh). 7.45, News in Finnish. 8.0, News in Swedish.

## LANGENBERG

635 kc/s, 473 metres; 60 kW.—11.0 a.m., Orchestral Concert, conducted by Kühn: Overture, The Hermit's Bell (Maillart); Waltz, Dreams on the Ocean (Gungl); Ballet égyptien (Luigini); Norwegian Rhapsody No. 1 (Halvorsen); Pas des fleurs from Nala (Delibes); Selection from Die sieben Schwaben (Müllöcker); Waltz, Neu-Wien (Joh. Strass). 12.15 p.m., See Frankfurt. 12.25, News and Weather. 12.35, See Stuttgart. 1.0, Meat Market Prices. 1.50, Talk for Workers. 2.10, Talk in connection with the Opening of the Ruhr Valley Museum in Schwerte (October 15th, 1933). 2.30, Exchange. 2.50, Government Announcement. 3.0, See Frankfurt. 5.0 to 5.35, See Stuttgart. 5.35, Talk: New Regulations regarding Patents and Patentees. 5.50, News. 6.0, Transmission for all German Stations, relayed from Munich. 7.0 to 9.20, See Frankfurt. 9.20, See Stuttgart. 9.30, News. 9.40, Serenade on Gramophone Records. 10.0, Old Cologne—Radio Sequence (Laurenz Klesgen). 11.0, Gramophone Concert: Wilhelm Backhaus (Pianoforte): Rhapsody in B Minor, Op. 79 (Brahms); Adele Kern (Soprano): Two Arias from Don Giovanni (Mozart); Wilhelm Backhaus: Three Waltzes, Op. 39 (Brahms); Heinrich Schlusnus (Baritone): Two Songs (Hugo Wolf): (a) Der Schreckenberger, (b) Frühling über's Jahr; Georg Müller (Flute): (a) Allegro assai from the Solo per il Flauto No. 131, and (b) Amorevole from the Solo per il Flauto. No. 150 (Frederick the Great); Elizabeth Schumann (Soprano): Two Songs (Schubert): (a) Heidenröslein, (b) Lied in Grün; Georg Kulenkampf (Violin): Romance in F (Beethoven); Ria Ginster (Soprano): Two Cradle Songs: (a) Guten Abend, gut' Nacht (Brahms), (b) Maria sitzt am Rosenbach (Reger); Wilhelm Backhaus: Hungarian Dances Nos. 6 and 7 (Brahms); Heinrich Schlusnus: Adaladie (Beethoven). 12 Mid-night, Close Down.

**Lausanne.**—See Radio-Suisse Romande.

## LEIPZIG

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—2.0 p.m., Concert of Light Music by the Leipzig Concertina Orchestra: Fantasia, Stimmt an mit hellem, hohen Klang (Hofmann); Romance, (Hermann); Humorous Variation on Was Kommt dort son der Höh (Suppé); Gavotte (Lattau); Dance, Trost im Leiden (Silevedel); Lorelyklänge (Nesudba); Styrian Dances (Lammer); Potpourri, Klänge aus dem Erzgebirge (Köbere); March, Aus dem Hohegebirge (Kanter). 3.0, Exchange and Market Prices. 3.20, Address by the President of the National Union of Artisans, for German Artisans' Week, on Gramophone Records. 3.40, Readings from the German Classics: Melusine. 4.0, Concert by the Station Chamber Orchestra, conducted by Wolfgang Daegner: Concerto for String Orchestra and Harpsichord (Torelli); Three Pieces from the Suite No. 1 for Orchestra (Bernhard Bach); Trio Sonata No. 4 in B (Gluck); Symphony No. 3 (Philip Emmanuel Bach); Theme and Variations (Michael Haydn). 4.50, Exchange, Weather and Time. 5.0, Italian Lesson. 5.30, Popular Melodies on Gramophone Records. 5.50, Review of the Day's News. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Choral Concert, relayed from Jena. 8.0, Cabaret Thirty Years ago—Literary and Musical Sequence. In the interval at 9.0, News. 10.0, (from Dresden), Concert by the Pletzsch Marko Orchestra: Overture, Das Mollch (Suppé); Waltz, Wiener Gemüt (Schrammel); In the Teahouse of a Hundred Steps (Yoshitomo); Scielletta (Blon); Potpourri, Heilmeshbergeriana (Ischpold); Waltz-Intermezzo, Ein lila Fächer (Siede); Selection from Frasquita (Lehar); Suite, A Day in Venice (Nevin); March Potpourri, Links, rechts (Eggert); Eine kleine Lieblei (Lautenschläger). 11.30 (approx.), Close Down.

**Linz.**—See Vienna.

## LJUBLJANA

522 kc/s, 574.7 metres; 7 kW.—6.0. Talk. 6.30, News for Listeners Abroad. 7.0, Gramophone Records. 7.30, Opera, relayed from Belgrade. In the interval, Time and News. 10.0, Close Down.

## LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW.—Italian Evening. 7.0 p.m., Gramophone Music: Selection from Requiem (Verdi) by the Orchestra and Choirs of the Scala Milan. 7.50, Popular Concert by the Station Orchestra. 8.50, News in French. 9.0, Terzetto for Two Violins and Viola (Dvorak). 9.15, Talk in Italian. 9.25, Song Recital by Famous Italian Tenors, on Gramophone Records. 9.50, News in German. 10.0, Le Pontane di Roma (Respighi) on Gramophone Records. 10.20, Dance Music.

## LWOW

788 kc/s, 381 metres; 16 kW.—5.45 p.m., Announcements and Gramophone Music. 6.40, Programme Announcements. 6.45, See Warsaw. 9.45, Gramophone Music. 10.30 (approx.), Close Down.

## LYONS

**LA DOUA**, 644 kc/s, 466.8 metres; 1.5 kW.—7.40 p.m., Radio Gazette for Lyons and the South East. 8.30, Concert of Chamber Music. Conductor: Strony. Soloist: Yves Tinayre (Tenor). After the Concert, News.

## MADRID

**ARANJUEZ (E.A.Q.)**, 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Popular Concert. In the interval at 10.45, Radio Chronicle. 11.35, Sports and Bull-fighting Notes. 11.40, Light Music. 12 Midnight till Close Down, Programme in English by the I.B.C. I.B.C. Concert: Polonaise in A flat (Chopin); Dream Tangles; La Précieuse (Kreisler); Allegretto (Bach); Hawaiian Sweetheart of Mine; Capulito de Alheli; Selection from Congress Dances; Garbo Gitana. 12.30 a.m. (Tuesday), I.B.C. Goodnight Melody.

## MADRID

**EAJ7**, 707 kc/s, 424.3 metres; 2kW.—7.0 p.m., Chimes, Exchange and Radio Journal. 7.20 (approx.), Baritone Song Recital: O Sole mio (Di Capua); Romance from Katuska (Sorozábal); Las hilanderas (Serrano); Russian Song from Katuska (Sorozábal); After the Programme, Dance Music. 8.15, Topical Review. 8.30 (approx.), Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

## MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Musil. Overture, Sicilian Vespers (Verdi); Selection from La Boite à Joux (Debussy); Cradle Song (Dvorak); National Dances (Provaznik): (a) Japanese, (b) Cosack, (c) Spanish; Blues (d'Alhert); Tarantella (Tomasi); Wooring Waltz (Kubin); Furiant (Bayer). 3.50, See Prague. 4.5, Gramophone Music. 4.15, Talk. 4.25, Gramophone Music. 4.35, See Prague. 4.50, Milan Balcar Song Recital, with the Composer at the Pianoforte. 5.15, See Prague. 5.30, German Stations—Two Legal Talks. 6.0, See Prague. 6.10, Talk: Crime and Society, relayed from Kosice, 1,022 kc/s, 293 metres. 6.25, See Brno. 7.25, Concert by a Country Band. 8.0, See Brno. 9.0, See Prague. 9.15 (approx.), Close Down.

## MOSCOW

**TRADES UNION**, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather. 1.45 p.m., Weather. 2.0, Concert of Music by Rachmaninov, Blumenfeld and Davidov. 3.0, English Lesson. 3.30, Reading (Mark Twain), followed by Sketches. Music in the intervals. 4.0, Literary and Musical Programme for Young People. 5.30, Quartet Concert. Soloists: Amatova (Soprano), Kubatskaya (Songs), and Feinberg (Pianoforte). 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

**MOTALA.**—See Stockholm.

**Muhlacker.**—See Stuttgart.

## MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Concert by the Otto Reiter Orchestra: Overture, Der Wildschütz (Lortzing); Algerian Scene (Kettelberg); Selection from The Bartered Bride (Smetana); Waltz, Die Schönen von Valencia (Morena); Potpourri, Selbige alte Wienerzeit (Morena); Intermezzo, Indianerlager (Leinberger); March: Frischer Mut, leichtes Blüt (Blon). 4.30, Talk by a Mason's Apprentice. 4.55, Humorous Programme. 5.25, Review of Books. 5.45, Time, Weather and Market Prices. 6.0, Transmission for all German Stations: Das Gansjüng—a Tragicomedy (Josef Maria Lutz). 7.0 (from Nürnberg), Military Band Concert: Overture, Nakiris Hochzeit (Lincke); Waltz, Hydropathen (Gungl); Beisoldaten (Kockert); Musikalische Täuschungen (Schreiner). 8.5, Concert of Light Music. 9.0, Austria. 9.20, Time and Weather. 10.0, Chamber Music by the Raba Quartet. 11.0 (approx.), Close Down.

**NAPLES.**—See Rome.

**Notodden.**—See Oslo.

## OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Concert by the Radio Ensemble. 5.0, German Lesson. 5.30, Concert of Norwegian Music by the Jim Johannessen Orchestra. 6.0, Announcements, Weather and News. 6.30, Election Results. In the intervals at 7.0, Time Signal, at 8.40, Weather and News, and at 9.5, Topical Talk. After the Programme, Gramophone Music.

**OSTERSUND.**—See Stockholm.

OCT. 16th **MONDAY** continued

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopplavoro Notes, Tourist Talk, Agricultural Report, Report of the Royal Geographical Society and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Concert of Chamber Music: by a String Quartet and Scala (Pianoforte). Quartet in D Minor op. 76 No. 2 (Haydn); Pianoforte Solos: (a) Minuet (Savasta), (b) Barcarolle (Di Chiara); Sonata in G for Violin and Pianoforte (Gavazzeni); Quartet: (a) Strimpellata (Tedesco), (b) Moment musical (Schubert), (c) Scherzo (Sinigaglia). 9.10, Variety Concert. 10.0 (approx.), Close Down.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Viennese Waltzes on Gramophone Records. 7.15, Le Journal Parle. 7.30, Hot Jazz on Gramophone Records. 8.0, Talk on Aviation. 8.5, Science Talk. 8.30, Song Recital. 9.15, Sponsored Concert. 10.30, News.

**PARIS**

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.45 a.m., Weather and Physical Culture. 7.45, Gramophone Music: Potpourri of Spanish Airs (Oros); Old Limousin Airs (Rouchard). 8.0, Weather and Press Review. 12 Noon, Military Band Concert on Gramophone Records. Regimental Music: Les Allobroges (Porot); Paris-Belfort (Farigoul); Le Grenadier du Caucase (Meister); Le Joyeux Trompette (Allier); March on a Theme from The Daughter of the Regiment (Donizetti-Dupont); Perthes les Hurlus (DeFrance); Indian March (Sellenick); Entr'acte from Carmen (Bizet); Ballet Music from Isoline (Messenger); Two Melodies from La Ferre (Lacome); Marche lorraine (Ganne); Invitation to the Dance (Weber); Les Préludes (Liszt); Allegro from the Roma Suite (Bizet); Spanish Caprice (Rimsky-Korsakov). In the interval at 1.0 p.m., Exchange, News and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.50, Review of the Week's Films. 7.0, Book Review. 7.20, Gramophone Music: La Carmine (Ganne); La Forêt qui chante (Charlys); Nuit grise (Borel-Clerc); Berceuse d'amour (Delmet); Sempere (Bianco); The Mooki (Fish). 7.45, News and Horticultural Talk. 8.0, Chamber Music and Recitations: Sonata for Cello and Pianoforte (Mozart). Recitations. Violin Solos: (a) Wiegand (Brahms), (b) Melody (Mendelssohn), (c) Rondino (Beethoven-Kreisler). Recitations. Pianoforte Solos: (a) Chromatic Fantasia (Bach), (b) Scherzo No. 4 (Chopin), (c) Mouvement (Debussy); String Quartet (Roussel). In the interval at 8.30, Commercial Prices and News, at 8.40, Review by Reboux, and at 9.15, Press Review and News.

**PITTSBURGH**

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.86 metres and 25.27 metres.—7.30 p.m., KDKA Home Forum. 8.0 to 10.15, New York Relay. 8.0, Ark-La-Tex Day. 9.0, Betty and Bob. 9.15, Radio Guild. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, Press News Reeler. 11.15, Sports, Pat Haley. 11.30, Pittsburgh Spotlights. 11.45 to 12.30 a.m. (Tuesday), New York Relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15, Baby Rose Marie. 12.30, Richfield Country Club. 1.0 to 3.0, New York Relay. 1.0, The Nomads. 1.30, Potash and Perlmutter. 1.45, Red Davis. 2.0, Sinclair Minstrels. 2.30, Melody Moments. 3.0, Silver-toppers.

PORSGRUND.—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Moravská-Ostrava. 3.50, Programme for Children. 4.5, Gramophone Music. 4.15, Talk. 4.25, Gramophone Music. 4.35, English Lesson. 4.50, Gramophone Music. 5.5, Agricultural Talk. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Two Talks: (a) Films, (b) Gymnastics. 6.0, Time and News. 6.10, Talk: Crime and Society, relayed from Kosice, 1,022 kc/s, 293 metres. 6.25, See Brno. 7.25, See Moravská-Ostrava. 8.0, See Brno. 9.0, Time and News. 9.15, Report in German: Social Institutions in Czechoslovakia. 9.30 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

SOTTENS, 743 kc/s, 403 metres, 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne). Gymnastics, 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Geneva), Gramophone Music. 12 Noon (from Geneva), Financial News. 12.10 p.m. (from Geneva), Gramophone Music. 1.0 to 2.28, Interval. 2.28, Time Signal from Neuchâtel Observatory. 3.0, See Schweizerischer Landessender. 5.0 (from Lausanne), Concert. 5.30 (from Lausanne), Programme for Children. 5.55 (from Lausanne), Italian Lesson. 6.20 (from Lausanne), Talk: Early Symptoms of Consumption. 6.45 (from Lausanne), Radio Chronicle. 6.59, Weather. 7.0 (from Lausanne), Tenor Song Recital by Leonid Kamsky: Two Popular Russian Songs; Berceuse (Theremin); Pimpinella (Tchaikovsky); Georgian Song (Rachmaninov); Song (Rachmaninov); Oriental Romance (Glazunov); Gopak (Mussorgsky). 7.30 (from Lausanne), Recitations. 7.50 (from Lausanne), Popular Programme by the Lausanne Station Orchestra and the Trio musette. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

sky); Georgian Song (Rachmaninov); Song (Rachmaninov); Oriental Romance (Glazunov); Gopak (Mussorgsky). 7.30 (from Lausanne), Recitations. 7.50 (from Lausanne), Popular Programme by the Lausanne Station Orchestra and the Trio musette. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

**REYKJAVIK**

250 kc/s, 1,200 metres; 21 kW.—11.0 a.m., Weather Forecast. 1.15 p.m., Variety Programme. 4.0, Weather Forecast. 8.10, Weather Forecast. 8.20, Music and Announcements. 9.0, Light Music. 10.0, Time and News. 10.30, Popular Airs and Vocal Solos by the Radio Quartet.

**RIGA**

572 kc/s, 525 metres; 15 kW.—5.30 p.m., English Lesson. 6.0, Weather. 6.5, Glazunov Concert: Ballad; Symphonic Poem; Steuka Itaz; Romantic Intermezzo; Mazurka; The Volza Boatman's Song; Scène de danse. 7.0, News. 7.25, Comedy (Allmans), with Music. 8.0, Weather and News. 8.10, Latvian Music. 8.30, Comedy (cont'd).

RJUKAN.—See Oslo.

**ROME**

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.45 p.m.; and 2RO, 11,810 kc/s, 25.4 metres from 4.15 p.m.—11.30 a.m., Gramophone Records of Opera and Variety Music. In the interval from 12.30 to 12.45 p.m., Giornale Radio and Exchange. 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15, Vocal and Instrumental Concert. Olga Brogno Cesareo (Pianoforte), Juliette Azevedo (Soprano) and Leandro Forti (Baritone): Pianoforte Solos: (a) Prelude in B minor (Mendelssohn), (b) Malagueña (Albeniz). Soprano Solos: Brazilian Songs. Pianoforte Solo: Jardins sous la pluie (Debussy). Baritone Solos: (a) Aria from Il figliuol prodigo (Ponchielli), (b) Aria from Hérodiade (Massenet), (c) Aria from Carmen (Bizet). 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopplavoro and Tourist Report. 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.5, Song Recital by Maria Elena Cattani (Soprano). 7.30, Giornale Radio and Sports Notes. 7.45, Concert of Light Music and Variety Music, conducted by Culotta. In the interval, Talk: Love Serenades. 10.0, Giornale Radio.

SALZBURG.—See Vienna.

**SCHENECTADY**

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—7.30 p.m., Revolving Stage, from New York. 8.0, Health Hunters—Sketch. 8.15, Soloist, from New York. 12.45 a.m. (Tuesday), Stock Reports. 1.0 till Close Down, New York Relay. 1.0, Soconyland Sketch. 1.30, Johns Manville. 2.0, Popular Programme. 2.30, Ship of Joy. 3.0, Contented Programme. 3.30, Musical Programme.

**SCHWEIZERISCHER LANDESENDER**

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne). Gymnastics. 11.0 (from Basle), Gramophone Music. 11.29, Time Signal from Neuchâtel Observatory. Weather and News. 11.40 (from Basle), Gramophone Folk Music. 12.25 p.m. (from Basle), Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Basle), Gramophone Music. 3.0 (from Basle), Concert by the Radio Quintet. 4.0 (from Basle), Gramophone Concert. 5.0 (from Basle), Programme for Children. 5.30 (from Zürich), Programme for Women. 6.0, Time and Weather Forecast. 6.5 (from Zürich), Brass Band Music on Gramophone Records. 6.20 (from Zürich), English Lesson. 6.50 (from Zürich), Reading of Poems. 8.0, Weather and News. 8.20 (from Zürich), Organ Recital. 9.15 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—12 Noon, Broadcast for Schools. 4.5 p.m. (from Göteborg), Accordion Music. 4.30, Reading. 4.45, Gramophone Music. 5.45, Talk on Modern German Literature. 6.15, Weather and News. 6.30, Talk: Heredity. 7.0, Pianoforte Recital by Victor Babin and Vitya Vronsky; Sonata in D (Mozart); Andante with Variations in B Flat, Op. 46 (Schumann); Sonata (Pou-

lenc). 7.50, A Visit with the Microphone. 8.10, Song Recital by Kerstin Lindberg-Torling. In the interval, Reading. 8.45, Weather and News. 9.0, Concert by the Herman Martensson Ensemble: Waltz, España (Waldteufel); Czardas No. 8 (Michiels); Selection from Martha (Flotow); Love Song (Suk); Liebestraum (Liszt); Intermezzo (Kahrman); Minuet in G (Mozart); Gavotte (Gossec); Mazurka, La Czarine (Ganne); Two-Step (Rouda). 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Concert of Classical Music. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Gramophone Concert of Light Music. 2.0, Interval. 5.0, Orchestral Concert, conducted by Roskam: March, Frühlingskinder (Blankenburg); Waltz, Twilight on the Water (Squire); Overture, La petite Bohème (Hirschmann); Suite on Themes of Schubert (Balf); Barcarolle (Tchaikovsky); Three Dances (German); Selection from The Gipsy Baron (Joh. Strauss). 6.0, Literary Review. 6.15, Review of the Week. 6.30, Orchestral Concert, conducted by Maurice de Villers: Overture, Preciosa (Weber); Orchestral Suite, En camargue (Delmas); Selection from Frederica (Lehar); Romance (Svendsen); Two Spanish Dances from La vida breve (Falla). 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German. Lottery Results and Announcements. 8.30, Pianoforte Recital by Lambotte: Préludes (Debussy); Pièces pittoresques (Chabrier); Caprice à cinq temps (Bordès); Prelude, Sicilienne and Aria (Castillon); Cuentas d'España (Turina); Three Pieces (Lambotte): (a) Impromptu on Walloon Themes, (b) Poésies, (c) Etude in the Form of Variations. In an interval at 9.30 (approx.), Press Review. 9.45, The Eroica Symphony (Beethoven) by the Station Orchestra, conducted by Maurice de Villers. 10.30 (approx.), Close Down.

**STUTTGART**

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.15 p.m., See Frankfurt. 12.25, Weather, Local News and Programme Announcements. 12.35 to 1.30, Reminiscences of Beyreuth—The Soloists, Choir and Orchestra of the Festspielhaus (on Gramophone Records). 2.15, Address by the President of the National Union of Artisans for German Artisans' Week (on Gramophone Records). 2.30, Talk: The Bavarian Forest. 3.0, See Frankfurt. 5.0, French Lesson. 5.20, Reading from the Works of Franz Heinrich Staerk. 5.35, Tales of Old Soldiers. 5.50, Time, Weather and Market Prices. 6.0, Transmission for all German Stations relayed from Munich. 7.0 to 9.0, See Frankfurt. 9.0, See Munich. 9.20, Talk: You must know... 9.30, See Frankfurt. 9.45, News. 10 to 12 Midnight, See Langenberg. 12 Midnight, Close Down.

SUNDSVALL.—See Stockholm.

**TOULOUSE**

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Hawaiian Guitar Music. 6.30, Songs from Operettas. 6.45, Argentine Music. 7.0, Popular Songs. 7.15, News. 7.30, Eine kleine Nachtmusik (Mozart), by a Symphony Orchestra. 7.45, Arias from Operas: Arrêtez, O mes frères from Samson et Déilah (Saint-Saëns); Micaëla's Aria from Carmen (Bizet); Adieu séjour fleur, from Madame Butterfly (Puccini); Prologue to I Pagliacci (Leoncavallo). 8.0, Airs from Operettas: Overture, Les Aventures du Roi Pausole (Honneger); Entr'acte from Brummel (Hahn); Selection from Le Pré aux Cleres (Hérold); Selection from The Bayadere (Kálmán). 8.15, Military Music. 8.30, Arias from Operas: Arias from The Magic Flute (Mozart); Philémon et Baucis (Gounod); Don Giovanni (Mozart); and L'Africain (Meyerbeer). 8.45, Orchestral Music. 9.0, Le roi d'Ys—Opera (Lalo)—Concert Version. 9.30, Orchestral Music and Songs. 10.0, Accordion Solos. 10.15, News. 10.30, Concert for Listeners in Morocco. 11.0, Request Music. 11.15, Dance Music. 12 Midnight, News. 12.5 a.m. (Tuesday), Viennese Music. 12.15, Hawaiian Guitar Solos. 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

TRONDHEIM.—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Orchestral Concert, conducted by Tito Petralia. 5.0 to 5.5, Weather. 5.40, Giornale Radio and

Tourist Talk. 6.10, Agricultural Notes, and Wheat Market Report. 6.30, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio and Weather. 7.15, Sponsored Concert. 8.15, Chamber Music. 9.30, Dance Music on Gramophone Records. 10.0, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—11.0 to 11.15 a.m., Religious Information in Italian. 8.0 to 8.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer: March, 's gibt nur a' Wien (Holzer); Josef Lamer Overture (Fährbachsen); Romance from the Violin Concerto No. 2 (Wieniawski); Waltz, Gold and Silver (Lehár); Potpourri of Viennese Folk Music (Komzák); Song of the Nightingale (Filipowsky). 10.55, Weather. 11.0, Weather. 11.0, Concert (cont'd): Die Glocken von Prag (Fucik); Duct from The Gipsy Baron (Joh. Strauss); Waltz, Lola (Beeth); Ländlich Burleske (Dörner); Viennese Song, Draussen in Mauer (Arnold); Selection from The Circus Princess (Kálmán). 12 Noon, Time and News. 12.10 p.m., Gramophone Records by Famous Artists. 2.0, Time and News. 2.20, Programme for Women. 2.30, Pianoforte Recital of Classical Music for Children. 2.55, Operetta Potpourris on Gramophone Records. 3.25, Talk for Young People. 3.50, Talk: Nietzsche as a Musician. 4.15, Aria Recital by Desider Kovacs (Baritone): Recitative and Aria from Don Sebastiano (Donizetti); Aria from La Strainera (Bellini); Aria from Linda di Chambray (Donizetti); Aria from Maria di Rudenz (Donizetti); Aria from William Tell (Rossini); Aria from Maria di Rohan (Donizetti). 4.55, Talk: Special Exhibits at the Folklore Museum. 5.15, Book and Works of Reference in Connection with the Week's Talks. 5.20, English Lesson. 5.45, Talk: Niels Bukh, the Danish Pioneer of Gymnastics. 6.5, Concert by the Wiener Symphoniker, conducted by Josef Holzer. Soloists: Hansl and Loisl (Songs). March, An der Lan (Kopetzky); Overture, Die Fledermaus (Joh. Strauss); 'Cello Solo, Füsse-Pied (Gillet); Songs: (a) O Herrgott, o Herrgott, a anzige Bitt', (b) Ahnrausch, Enzian and Edelweiss; Selection from Die geschiedene Frau (Fall); Scherzo (Schubert-Werner); Waltz, Hereinspaziert (Ziehrer); Song, Die Männertrübe; Suite, Knicks-Knacks (Tapp); Songs: (a) Heimatstädtchen (Biron), (b) Der Summa is aussi, (c) Erzhzog Johann; Marching Song, Heiss küst Anusoecka (Flemming); (b) Spanish Song, Arabella, holde Blume der Sierra (Flemming); Waltz, Auf den Bergen wohnt die Freiheit (Komzák); Potpourri, Ein lustiger Marsch durch Wien (Stilp). In the interval at 6.45, Time and News. 7.45, Topical Talk. 8.0, Concert by the Vienna Philharmonic Orchestra, conducted by Oswald Kabasta. Soloists: Mairacker (Violin) and Moravec (Viola). Don Juan, Symphonic Poem, Op. 20 (R. Strauss); Symphonie concertante in E flat for Violin and Viola (Mozart); Suite from The Fire Bird (Stravinsky). 9.10, News, Weather and Announcements. 9.25, Dance Music on Gramophone Records, followed by Announcements.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Gramophone Records of Songs. 11.30, Radio Journal and Weather. 11.35, Symphony No. 2 (Brahms) on Gramophone Records. 12 Noon, Interval. 2.30 p.m., Economic Notes. 2.40, Tourist Report. 2.45, Anti-Gas Drill and Aviation Report. 2.55, Orchestral Concert, relayed from Lwów. 3.40, Elementary French Lesson. 3.55, Concert of Chamber Music: Trio in E flat (Mozart); Trio in E flat (Brahms). 4.50, Agricultural Notes. 5.0, Talk: A Visit to the Polish Settlements in Brazil, the Argentine and Uruguay. 5.20, Programme for Soldiers. 5.45, Miscellaneous Items. 6.5, Concert of the Works of Radzwill, Oginski and Poniatowski with Introductory Talk. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Popina—Operetta (Stolz). In the intervals, Reading and Sports Notes. 9.40, Weather and Police Notes. 9.45, Dance Music on Gramophone Records.

**WILNO**

533 kc/s, 563 metres; 16 kW.—6.0 p.m., Miscellaneous Items. 6.5, See Warsaw. 6.40, Programme Announcements. 6.45 till Close Down, See Warsaw.

**ZAGREB**

977 kc/s, 307 metres; 0.75 kW.—6.35 p.m., Book Review. 6.50, Announcements. 7.20, Introductory Talk to the following Transmission. 7.30, See Belgrade. In the intervals, News. 10.0 (approx.), Close Down.

ZURICH.—See Schweizerischer Landessender.

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Report, and Gramophone Concert. 6.0, Programme for Children. 6.40, News. 7.0, Talk. 7.15, Talk: The Work of the St. John's Ambulance Brigade. 7.30, Time. 7.31, Concert by Amy Ellard's Instrumental Trio. 8.0, Concert by the Culwick Choral Society, relayed from the Metropolitan Hall. 9.0, Harp Solos by Treasa Ni Chormaic. 9.15, Song Recital by Geoid O Lochlainn. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Concert. Butterflies in the Rain (Reaves); You've got me cryin' again (Newman); No more love (Friend); Hustlin' and Bustlin' for Baby (Woods). 9.45, Concert on behalf of The People's Dispensary for Sick Animals. Arabesque (Debussy); Song, Am Meere (Schubert); Rustle of Spring (Sinding); Prelude in C Sharp Minor (Rachmaninov). 10.0, Wireless World Announcement. 10.2, Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Smilin' through (Penn); Kesako (Chapin); Selection from The Gipsy Princess (Kálmán); Racing Commentary; Rosa Mia (Gúizar); Fairy Tales (Ileykens); Spanish Sweetheart (Hargreaves); Waltz from Der Rosenkavalier (R. Strauss). 10.30, I.B.C. Good-night Melody, followed by News and Weather. 10.40, Traditional Songs. 10.50, Instrumental Trio Music. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Selection from Manon (Massenet); Melody (Delille); Aria (d'Ambrósio); Intermezzo from Cavalleria rusticana (Mascagni); March from The Ruins of Athens (Beethoven); Rondo (Elgar); Selection from Faust (Gounod). 7.0, Request Gramophone Music. 7.30, Exchange and Talk in Catalan. 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices. 9.5, Sponsored Programme. 9.30, Scènes napolitaines (Massenet), by the Station Orchestra. 10.0, Popular Concert by the Orfeo Atlántida. 11.0, News and Opera Music on Gramophone Records. 12 Mid-night (approx.), Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—11.30 a.m., See Rome. 12 Noon, Concert from Turin. 1.0 p.m., See Rome. 3.30, Quintet Concert: Rumba pasana (d'Anzi); Autumn (Romanelli); Piccola serenata (Scassola); Medievale Suite (Amadei); Passa il torero (Bixio). 3.55 to 5.0, See Rome. 5.35, News in Albanian. 5.45 (approx.) till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—6.30 p.m., Pianoforte Recital by Mihovil Logar: Sonate quasi uno scherzo (Logar); Two Japanese Tales (Logar); Tango berceuse (Logar); Petite Suite for Pianoforte (Vukdragovic). 7.10, Dramatic Programme. 8.5, Concert by the Radio Orchestra. In the interval at 9.10, Time and News. 9.45, Gramophone Dance Music.

## BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—11.5, Gramophone Concert: Potpourri of Old Dances. 11.55, Time. 12.45 p.m., News. 1.0, Gramophone Concert of Modern Orchestral Music: Prometheus (Scriabin); Czardas and Mazurka from Coppélia (Delibes); Spanish Caprice (Rimsky-Korsakov); Petite Suite (Debussy); Bolero (Ravel). 2.0, Talk for Young People. 2.30, Weather and Exchange. 2.45, Reading from Das Kaiserbuch (Paul Ernst). 3.0, See Leipzig. 4.0, Talk for Women. 4.20, Concert of Light Music by the Bernard Derksen Orchestra. Overture, Albin (Flotow); Waltz, Wiener Herzen (Derksen); Wiegenlied (Mozart); Schwärmer Tänze (Lewalter); Rocco und Romantik (Derksen); Selection from Barfüssele (Heuberger). 5.0, Poems. 5.5, Talk: Bayreuth under the New Regime. 5.25, Political Press Review. 5.45, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, Talk: The Disarmament Conference. 7.10, Through Ireland—a Journey on Gramophone Records. 8.0, Dance Music. 9.0, News and Talk. 9.45, Weather. 10.0, Concert from Hamburg. 11.0 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—5.0 p.m., Gramophone Concert: Rendezvous der Puppen (Gebhardt); Waltz, Was dein roter Mund im Frühling sagt (Böhme-Buscby); Gavotte caprice (Bortkiewicz); Humoresque (Dvorak); Saxophone (Wiedoeff); Dizzy Fingers (Confrey); Waltz, Frühlingsstimmen (Joh. Strauss); Tango, Kleiner Mann, was nun (Böhme-Busch); Foxrot, Fensterpromenade (Mohr). 5.30, The Funkstunde informs its Listeners. . . . 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, See Berlin (Deutschlandsender). 7.10, Lottery Announcements. 7.15, Vom braven Kasperl und dem schönen Annerl—An Old Village Tale (Clemens Brentano, arranged

for the Radio by Ernst Bringolf). 8.10, Rudolf Peterka: Memorial Programme by the Station Orchestra, conducted by Otto Frickhoeffler and the Steiner Quartet, with Gertrud Baumann (Soprano): The Last Sun-Öde by Emile Verhaeren—for Soprano, Cello, and Pianoforte; String Quartet in A Minor, Op. 9; Three Songs for Soprano and Orchestra, Op. 7; Entr'acte and Aria from Rosanna. 9.0, News. 9.20, See Hamburg. In the interval from 10.0 to 10.5, Talk: The Stage and the Cinema. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BREMEN.—See Hamburg.

BREMEN.—See Hamburg.

BRESLAU  
923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12 Noon, Weather. 12.5 p.m. (approx.), Gramophone Concert: Overture, Fasching (Schmalstich); Extase (Ganne); Ballet Music from Rosamunde (Schubert); Ständchen (Richard Strauss); Dem Unendlichen (Schubert); The Sacred Hour (Kettelhey); Spatzenparade (Rathke); Potpourri of Old Operetta Music. 12.45, Time and News. 1.0, Song Recital by Alfred Stöckel (Tenor); Five Songs (Schubert): (a) An die Leier, (b) Ihr Grab, (c) Erster Verlust, (d) Der Fischer, (e) Der Jüngling an der Quelle; Four Songs (Hugo Wolf): (a) Der Genesene an die Hoffnung, (b) Auf einer Wanderung, (c) Der Tambour, (d) Der Knabe und das Immelein. 1.40, Brahms Music on Gramophone Records: Tragic Overture, Op. 81; Serenade for Orchestra, Op. 11; Scherzo in D; Minuet in A. 2.0, Market Prices. 2.15, Review of Books. 2.35, Programme for Children. 3.0, Gramophone Concert: Overture, Iphigénie en Aulis (Gluck-Wagner); Air from the Suite in D (Bach); Overture, Der Freischütz (Weber); Entr'acte Music in B flat from Rosamunde (Schubert); Prelude to the First Act of Lohengrin (Wagner); Hungarian Dances Nos. 1 and 3 (Brahms). 4.20, Market Prices. 4.25 (approx.), Gramophone Concert of Modern Music: Preludes to the First and Second Acts of Palestrina (Hans Firtzner); Entr'acte from Khovantchina (Musorgsky); Prometheus (Scriabin); L'apprenti sorcier (Dukas). 5.0, Talk with Readings: The Poet Josep Magnus Welner and his Works. 5.15, Topical Programme. 5.35, Talk: Luther and Rome. 5.50, Market Prices. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, See Berlin (Deutschlandsender). 7.10 to 9.0, Programme for German Artisans' Week. 7.10, For Two Marks—Radio Play (Ernst Johannsen). 8.0, News. 8.10, Concert by a Workers' Choir: Freiheit (Schenkendorf-Groos); Aufbruch (Dohn-Brauner); Folk-Song, Des Handwerkerbüchsen Abschied (arr. Heinrichs); Glückauf (arr. Dost); Meister und Gesell (Grübel-Zelter); Von Hause muss ich fort (arr. Scheffer); Two Folk-Songs (arr. Brauner): (a) Und in dem Schneegebirge, (b) Schneiderhochzeit; Cologne Folk-Song, Der Schiffer auf dem Rhein; Folk-Song, Jetzt kommen die lustigen Tage; Das Eisenlied (Arndt-Methfessel). 9.0, Time and News. 9.25, Political Press Review. 9.45, Light Music and Dance Music from the Stadthaus-Kaffee, Neisse. 11.30 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

BRATISLAVA  
1,076 kc/s, 279 metres; 14 kW.—4.50 p.m., 'Cello Recital by Greta Ilahova. Sicilienne (W. F. Bach); Sonata in Old Spanish Style (Cassado); Two Pieces (Schumann): (a) Träumerei, (b) Abendlied; Andante from Concerto No. 2, Op. 14 (Davidov); Spanish Dance, Op. 54, No. 1 (Popper); La fleuse, Op. 15 (Dunkler). 5.30, Gramophone Music. 5.40, Morse Lesson. 5.50, Talk for Housewives. 6.0, See Prague. 6.25, Humoresques for Pianoforte, Op. 101 (Dvorák); by Sylvia Macudzinska. 6.50, Concert by the Station Band. 7.20, See Brno. 9.0 till Close Down, See Prague. 10.0 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission: News, Talk, and Agricultural Report. 6.0, See Prague. 6.25, See Moravská-Ostrava. 7.20, The Peace—Play (Aristophanes), arranged for Radio by Bezdicek. 9.0, See Prague. 10.0 (approx.), Close Down.

TUESDAY  
OCTOBER THE SEVENTEENTH

## BRUSSELS (No. 1)

1.1.N.R., 690 kc/s, 569 metres; 15 kW.—12 Noon, Gramophone Music. 12.20 p.m., Pianoforte Recital by Mlle. André Lambourg. Venezia e Napoli (Liszt); Impromptu, No. 3 (Fauré). 12.45, Gramophone Music (cont.). 1.0, Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans. 5.0, Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans. Overture, Hamlet (Gade); Dance of the Fireflies, from The Damnation of Faust (Berlioz); Dance of the Sylphs, from the Damnation of Faust (Berlioz); Peer Gynt, Suite No. 2 (Grieg). 5.30, Programme for Children. 6.5, Literary Talk. 6.15, Gramophone Music. Symphonie Piece Rugby (Honegger); Saudades do Brazil (Milhaud); Prelude and Fugue in G (Bach). 6.30, 'Cello Recital by Rops. Largo (Danzig); Melody (Plum); Thamineh (Knosp); Romance (Risler) Poème (Rops); Berceuse (Rops). 7.0, Recital of Seventeenth and Eighteenth Century Songs by Victor Avart. 7.30, Art Notes and Talk for Women. 8.0, Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans. Soloist: Léon Roy ('Cello). Overture, The Mastersingers (Wagner); 'Cello (concerto (Lalo); Pavane pour une infante défunte (Ravel); March from The Loves for the Three Oranges (Prokofiev). 8.45, Religious Talk: The Eucharistic Congress at Kisanu. 9.0, Concert (cont.), Overture, The Bartered Bride (Smetana); Ballet Music from Rosamunde (Schubert); Les heures (Goeyens); In the Steppes of Central Asia (Borodin). 9.45, 'Cello Solos. 9.55, Christus Vincit (Liszt). 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

1.1.N.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans. 1.0 p.m., Journal Parlé. 1.10, Gramophone Concert. 5.0, Gramophone Concert: Foxrot, Orange Blossom Time (Godwin); Waltz, Künstlerleben (Strauss); Your mother and mine (Godwin); One-step, New York (Padilla); Foxrot. In the Evening (Hamley); Waltz, Love me (Morse); Foxrot, At Twilight (Tracy-Pinkard); Blues (Uranga); Tango, Vergh, vergh, Paloma (Brotsky); Two-Step (Hollaender); Waiting at the end of the Road (Berlin); Blues (Darantés); Waltz from Eva (Lehár); Foxrot, O Mona (Weems). 5.45, Programme for Children. 6.30, Concert by the Small Station Orchestra, conducted by Leemans; Soloist, Wigy (Violin): Festival March (Henneberg); Minuet for String Quintet (Wyngaard); Valse-Scherzo for Violin and Orchestra (Tchaikovsky). Gramophone Records: Der Neugierige (Schubert). Der Lindenbaum (Schubert); Four Lyric Pieces (Doulez); (a) Au printemps, (b) Scherzettino, (c) Intermezzo, (d) Une larme; Flemish Divertissement (Vidal); Scherzettino, Pluck and Plouck (Smissen); Tarantella, Grotta azzurra (Olivieri). 7.15, Talk. 7.30, Journal Parlé. 8.0, Musical Medley (Suls). 10.0, Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Light Music and Romanian Music by the Motzoll Orchestra. In the interval at 5.0, Radio Journal. 6.0, Educational Programme. 6.20, Orchestral Music on Gramophone Records. 6.40, Talk. 7.0, Song Recital by Mme. Gigartu. 7.20, Concert of Viennese Music by the Station Orchestra, conducted by Alessandresco. 8.0, Talk. 8.15, Concert (cont.). 8.45, Radio Journal.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 8.40 metres from 6.30 p.m. (approx.), till Close Down.—4.30 p.m., Gounod Concert on Gramophone Records, with Explanatory Notes. 5.10, Talk. 5.40, Military Band Concert conducted by Fricsev. 6.30, The Flying Dutchman—Opera in Three Acts (Wagner), relayed from the Opera House. News in the interval. 9.0, Weather. 9.10 (approx.), Concert by the Alexander Bura Cigány Band, relayed from the Hotel Metropole. 10.0, Dance Music from the Hotel Royal.

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall. 11.2, Concert by the Bendix String Ensemble, relayed from the Wivex Restaurant. 1.0 p.m., Interval. 2.0, Concert by the Carl Rydalis (Instrumental Ensemble. 4.0, Programme for Children. 4.30, Exchange and Fish Market Prices. 4.45, Talk on Colonies. 5.15, Elementary German Lesson. 5.45, Weather. 5.54, Announcement. 6.0, News. 6.15, Time

Signal. 6.30, Talk on Wireless. 7.0, Time Signal from the Town Hall. 7.1, Concert of French Ballet Music by the Radio Orchestra, conducted by Emil Reesen: Selection from Céphale et Procris (Grétry); Selection from Namouna (Lalo). 7.35, Recital of Old Danish Songs, by Anna Hagen. 7.50, Hekkeri eller blind Alarm—Comedy in Five Acts (Ludvig Holberg). 9.15, News. 9.30, Concert of Opera Music by the Radio Orchestra, conducted by Emil Reesen: Overture, Abu Hassan (Weber); Ballet Music from Aladdin (Horneman); Selection from Hansel and Gretel (Humperdinck); Overture, La Cenerentola (Rossini); Selection from Turandot (Puccini). 10.10, Dance Music by the Jens Waryn Band, relayed from the Nimo Restaurant. In an interval at 11.0, Time Signal and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C. Happy Hour: Signature Tune; Naval Patrol (Williams); Birthday Serenade (Lincke); Post Horn Gallop (Koenig); Selection from Turkish Patrol (Michaels); Loin du bal (Gillet); General Mulcahy March (Brace); Sussex by the Sea (Ward-Higgs). Part II, Dance Music: Thank Heaven for you; Oh, Johanna; I'll show you off; I remember you from Somewhere; My Bluebird's singing the Blues; Lazybones; Wedding of the Dragonflies; Happy Ending; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0 p.m., Programme in English by the I.B.C. 4.30, The Nursery (Corner). 5.0, Concert for Torquay and Exeter, on Gramophone Records: Signature Tune; The Night by the Sea; Wine, Woman and Song (Strauss); Fluttering Birds (Gennin); One Little Hair on his Head (Castling); Throw open wide your Window (Calson); A Radio Roundabout (arr. Noack); Little Tommy (Macy); A Catastrophe (Spigau); Dirt Dishin' Daisy (Klein); Selection from The Flower of Hawaii (Abraham). 5.30, Organ Recital for Plymouth and Devonport: Potted Overtures (arr. Englemann); There's an Organ playing in my Dreams (Corder); Xylophone and Organ Duet: Down South (Myddleton); The Old Spinning Wheel (Hill); Trees (Rashach); Rain on the Roof (Ronell); Pianoforte and Organ Duet: Mari-gold (Mayerl); My Wishing Song (Burke); Signature Tune. 6.0, Programme in French. 10.0 (approx.) till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune; Bells of Normandy; Sweet Dreams, Pretty Lady; Carry me back to Green, Green Pastures; Lazybones; Wedding of the Dragonflies; Adorable; Reflections in the Water; Two Buck Tim from Timbuctoo; My Gipsy Rhapsody; At the Old Pig and Whistle; It was a Night in June; My Bluebird's singing the Blues; Sundown in a Little Green Hollow; Seven Years with the Wrong Woman; Come out, Vienna, I'll show you off; Oh! Johanna; Learn to croon. 11.0, Tunes from the Talkies: Signature Tune; Sittin' in the Dark; Smilin' through (Penn); Mrs. Bartholomew (Ellis); The moment I saw you; In the Moonlight (Kalmár); The Gold-Diggers' Song (Dubin); Let me give my Happiness to you (Posford); But for you (Hollander); My Lucky Day; Signature Tune. 11.30, Concert by the International Broadcasting Company (Ireland), Ltd., on Behalf of the Irish Hospitals Sweepstake Authorities: Signature Tune; Come back to Erin; The Clatter of the Clogs (Flynn); Selection from He wanted Adventure (Waller); My Little Irish Cottage (Summers); Pan and the Wood Goblins (Rathke); Song, The Blackbird in the Apple Tree (Lubbock); The dear little Shamrock; The Child from Alsace (Lehá); Waldeufel Potpourri (arr. Finck); Signature Tune. Come back to Erin. 12.5 a.m. (Wednesday), Late News Bulletin in English. 12.10 (approx.), Club Concert for Whitstable and Herne Bay Listeners: Signature Tune; The Chum Song; Lawd, you made the Night too long (Lewis); Moon over Dixie (Ellington); Arm in Arm (Zimmann); Millie (Brown); Farewell Blues (Shoebel); Let's all be happy together (Leslie); There's a Cabin in the Pines (Hill); Sweep (Furber); A Girl like Nina (Hammerstein); Thank Heaven for you (Robin); Love Songs of the Nile (Freud); Look what I've got (Rainger); Someone stole Gabriel's Horn (Mills); Signature Tune. 1.0, Dance Music: Signature Tune; The Bells of Normandy; Hot Feet (Mellugh); Drifting down the Shalimar (The Gold-Digger's Song); The Windmill Waltz; A Woman should stick to her Man; I've told every little Star; Under a Blanket of Blue; I can't remember; When it's Lamp-lightin' Time in the Valley; The Language of Love; I'm one of the Lads of Valencia; Look what you've done; My Wishing Song; You did Everything for me; Stormy Weather; I shall still keep smiling along; Pop Gun; Isn't it heavenly? 2.0, I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

OCT. 17th **TUESDAY** continued

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News, 12.25, Local News and Weather, 12.35, See Stuttgart. 1.30, The Care of the Health of the Hitler Jugend Programme of Speeches relayed from the Charité, Berlin, 2.30, Weather, 2.40, Time and Economic Notes, 3.0, See Leipzig. 5.0, Italian Lesson, 5.20, Medical Talk, 5.35, Talk on Economics, 5.50, News, 6.0, Transmission for all German Stations; German Wine—Radio Sequence (Wilhelm Fraenger), 7.0, See Berlin (Deutschlandsender), 7.10 to 9.0, See Langenberg, 9.0, News, 9.20, See Stuttgart, 9.30, Time and News, 9.45 to 11.0, See Stuttgart, 11.0, Von deutscher Seele—a German Cantata (Brockmeier), 12 Midnight (approx.), Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

306 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m., Transmission for all German Stations, relayed from Frankfurt, 7.0, See Berlin (Deutschlandsender), 7.10, Illustrated Talk: The Guild of the Mastersingers, 7.50, Choral Concert, conducted by Gerhard Gregor; Lied der Arbeit (Knorr); Two Folk Melodies; (a) Die Leineweber, (b) Loblied auf die Leineweber; Miner's Song (Armin Knab); Folk Song, Glückauf, der Steiger kommt; Deutsche Handelshymne (Lendvai); Folk Melody, Der Schlosser und sein Gesell; Ein Kellner und ein Koch (Andreas Rauch); Folk Melody, Der Schneider Jahrestag; Folk Melody, Handwerksburschen-Abschied; Folk Melody, Jetzt reisen wir Burschen, 8.30, Reading of Stories (Hans Freundt), 9.0, News, 9.20, Orchestral Concert, conducted by José Eibenschütz; Academie Festival Overture (Brahms); Concert Suite from Domenico (Mozart-Busoni); Turkish March from The Ruins of Athens (Beethoven); Elegie und Musette from the King Christian Suite No. 2 (Sibelius); Overture, Das Nachtlager von Granada (Kreutzer); Ballet Music from Coppélia (Delibes); Selection from The Merry Widow (Lehár); Waltz, Wiener Bonbons (Joh. Strauss).

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—10.30 a.m., concert by the Small Station Orchestra, conducted by Eugen Wilken, 12.5 p.m., Gramophone Concert of Music from Musical Plays and Operetta, in the intervals at 12.20 and 1.0, News, 1.30, Programme arranged by the Post Office, with Gramophone Records, 2.0, Market Prices, 2.15, Earlythines for Children, 2.40, Talk: Feminism of a German Woman in Albania, 3.0, Concert by the Small Station Orchestra, conducted by Eugen Wilken; Miniature Suite, Karneval (Kaskel); Waltz, Am schönen Rhein (Keler-Bela); Overture, Wanda (Dvorák); Selection from L'Africaine (Meyerbeer); Indian Suite No. 2 (Lüling); Potpourri, Drei Sträuße (Lindemann); Waltz, Herzlake (Bayer); Overture, Isabella (Suppé); Attila-Marsch (Fucik). In the interval at 3.50, Talk: What are German Women to do for their Nation? 4.50, Review of Books on Fascism, 5.15, Market Prices, 5.25, Talk: Building Roads, 5.50, Weather, 6.0, Transmission for all German Stations, relayed from Frankfurt, 7.0, See Berlin (Deutschlandsender), 7.10, News and Weather, 7.15, Das Fest der Handwerker—Comedy (Angely), 8.20, Variety Programme, 9.0, News, followed by Political Press Review.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW, up to 5.40 a.m. and 20 kW. from 5.40 p.m.—Programme of the Allgemeine Vereinigung Radio Omop (A.V.R.O.), 10.10 a.m., Song and Organ recital, 10.40, Talk on Cookery: Apples and Pears, 11.10, Concert (cont'd), 11.40, Concert by the Wireless Orchestra, conducted by Nico Gerhartz, 1.55 to 2.10 p.m., Interval, 2.10, Concert by the Wireless Orchestra, conducted by Nico Gerhartz; Sérènes pittoresques (Massenet); Selection from La Bohème (Leoncavallo), 2.40, Dress-making Lesson, 3.0, Pianoforte Recital, 4.10, Concert by a Children's Choir, 4.40, A Radio Play for children, 5.10, Talk, 5.40, Concert of Light Music by Hans Schindler and his Orchestra, 6.10, Talk, 6.40, Song Recital by Hans Fräns; Maimacht (Brahms); Ständchen (Brahms); El Pano moruno (Falala); Jota (Falala); La berceuse, in marin (Aubert); Fautaise prière (Aubert); Adieux de l'émigré arabe (Bizet); Pastoral (Bizet), 7.0, English Lesson, 7.40, Time and News, 8.45, Concert with Commentary, 9.10, Inquest—Radio Play (Michael Barringer), 9.55,

Concert of Light Music by Hans Schindler and his Orchestra, 10.40, News, 10.45, Gramophone Music, 10.55, Dance Music on Gramophone Records, 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW until 3.40 p.m. Transmitted from Kootwijk on 50 kW. from 3.40 p.m. Programme of the Catholic Radio Society (K.R.O.),—11.40 a.m., Police Notes, 11.55, Concert by the K.R.O. Orchestra, 1.25, Interval, 1.40, Programme for Women, 2.40, Concert by the Vienna Station Octet: A la bien aimée (Schmitt); Song and Tarantella (Popper); Blumengeheimnis (Neuhauser); La capriccioso (Ries); Gipsy Dance No. 1 (Nachez); Serenade (Oelschlegel); Rondo capriccioso (Mendelssohn); Waltz, Wienerblut (Strauss); Bei der Weinsche in Tokay (Hör); Mein Regiment (Blankenburg); Dorf-kinder (Kälmmán); Overture, The Gipsy Baron (Strauss); Nocturne No. 3 (Liszt); Spring Song (Mendelssohn); Selection from I Pagliacci (Leoncavallo); Fideles Wien (Komzak); In a Persian Market (Ketchey); Selection from The Flower of Hawaii (Abraham); Finale. In the intervals at 3.40, Programme by the H.L.R.O., and at 5.40, Talk, 6.20, Esperanto Lesson, 6.40, Police Notes, 6.55, Theological Talk, 7.15, Gramophone Music. In the interval at 7.25, Talk, 7.45,

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—12.30 p.m., Gramophone Concert, 1.15 p.m., News, 1.30, Programme to be announced, 2.15, Talk: Books we are awaiting—Segelflug (Beumelburg), 2.35, Exchange, 3.0, Concert by the Station Orchestra, conducted by Hilmar Weber; Overture, Die Eisenmühle (Reissiger); Selection from La Traviata (Verdi); Minuet from the Serenade in E Minor (Hofmann); A Feast in Aranjuez (Demerssemann) Waltz, Künstlerleben (Joh. Strauss); Selection from Paganini (Lehár), 4.10, Concert of Chamber Music; Serenade for Flute and Pianoforte (Friedrich Karl Grimm); Three Studies Op. 4 for Violin, Cello and Harp (Ernst Rudolph); Suite for Cello and Pianoforte Op. 27, No. 1 (Friedrich Karl Grimm), 4.50, Exchange, Weather and Time, 5.0, Review of Books, 5.30, Talk: Achievements of German Research, 5.50, Review of the Day's News, 6.0, Transmission for all German Stations, relayed from Frankfurt, 7.0, See Berlin (Deutschlandsender), 7.10, Mountain Strongholds: On the Roßsburg in the Mulden—a Radio Picture, 7.45, Pachernegg Concert by the Dresden Philharmonic Orchestra, conducted by the Composer; Old German Dance Suite; Styrian Dances Op. 35, No. 1; Lustige Jagdmusik; Suite, German Baroque; Three Dances from Bavaria; Austrian Peasant Dances; Old Styrian

in French, 9.0, Song Recital by René Toubeau; Richard, Cœur de Lion (Grétry); A Toi (Paul Lobrum); Bonsoir (Guillemin); Extase (Radoux); Sérénade from Milenka (Blockx); Sonnet (Huberti); Chanson des heures (Rasse), 9.30, Violin Recital on Gramophone Records, 9.45, News in German, 9.55, Concert by the Radio Orchestra, conducted by Pensis; Overture, Abu Hassan (Weber); Tango des Aveux (Denaret); Dolly (d'Argréves); Liszt Potpourri (Ur-bach), 10.20, Dance Music on Gramophone Records.

**MADRID**

**ARANJUEZ; EAQ; 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Popular Concert.** In the interval at 10.45, Radio Chronicle, 11.35, Spanish-American Talk, 11.45, Light Music, 12 Midnight till Close Down, Programme in English by the I.B.C. I.B.C. Concert, Mama Ines; March from the Vagabond King; Hot Feet; Bidin' my time; All through the Night; Black Eyes; Secret; Beautiful Spring, 12.30 a.m. (Wednesday), I.B.C. Goodnight Melody.

**MADRID**

**EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Radio Journal, and Request Gramophone Music.** In the interval Talk by Joaquín España Cantos, 8.15, Topical Review, 8.30, Interval, 9.15, English Lesson, 9.30, Chimes, Time, Topical Review, and Musical Comedy Programme, 11.45, Topical Review, 12 Midnight, Chimes, 1.0 to 2.0 a.m. (Wednesday), Programme in English by the I.B.C. Dance Music, Stay out of my Dreams; My Lucky Day; Somebody stole my Gal; Drifting down the Shalimar; Hurricane Harry; What did I do?; Return of Johnnie; Sweet Savannah Sue; I raised my Hat; Mandoline Solo, Faust Medley (Gonod); Twelfth-Street Rag; Roll up the Carpet; Song, Sympathy; On the other Side of Lover's Lane; Happy as the Day is Long; The Buffoon; Let's call it a Day, 2.0, I.B.C. Good-night Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—6.25 p.m., Autumn Programme of Poetry and Music, 7.20, See Brno, 9.0, See Prague, 10.0 (approx.), Close Down.

**MOSCOW**

**TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather, 1.45 p.m., Weather Report, 2.0, The Dance in Nineteenth Century Opera—Orchestral Concert.** Soloists: Muratova (Soprano), Kuteherenko (Soprano) and Meuchin (Tenor), 3.30, Literary Programme, 4.30, Programme by the Workers' Amateur Art Society, 5.30, Concert of Ballet Music, conducted by Lukin, with Gramophone Records and Sound Film Music in the intervals, 8.0, News, 8.30, Programme Announcements, 8.55, Chimes from the Red Square, 9.5, Press Review, 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—4.0 p.m., Concert conducted by Erich Kloss; Jubel-Ouverture (Ch. Bach); Lyric Suite (d'Albert); Selection from Le Bourgeois Gentilhomme (Richard Strauss); Styrian Ländler (Lammer); Faust Fantasia (Sarasate); Russian Melody, Dvubinschka (Schirmann); Chaconne (Durand); Teufelsmarsch (Suppé), 5.0, Talk on Christian Wagner, the Swabian Peasant Author, 5.20, Egon Kornant Recital, with the Composer at the Pianoforte; Flöten-Burleske, Op. 13; Sonatina for Violin, Op. 15, 5.45, Time, Weather and Market Prices, 6.0, Transmission for all German Stations relayed from Frankfurt, 7.0, Frasquita—Operetta in Three Acts (Lehár), 8.40, Talk from the Sequence: The German and the Russian Revolutions, 9.0, Time and News.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Orchestral Concert, relayed from the Lyche Restaurant, 5.0, Programme for Housewives, 5.45, Interval, 6.0, Announcements, Weather and News, 7.0, Time Signal, 7.1, Orchestral Concert, conducted by Kramm; Hurra, die Musik kommt (Zimmer); Humorous Variations on Popular Italian Melodies (Ritzau); Waltz, Wine, Woman and Song (Strauss); Potpourri (J. Klein); Polka from Frauenherz (Jos. Strauss); The Elves' Ball (Teilmann); Piccolo and Double-Bass Duet, The Gnat and the Elephant (Kling); Perpetuum mobile (Strauss); Dance



The Journal Parlé, one of the most popular features at Brussels No. 1, entails much careful selection from the news of the day. Here is the editorial staff at work.

White Horse Inn—Operetta in Three Acts (Stolz-Benatzky), relayed from the Stadtsschauspiel Theatre, Amsterdam, News in the intervals, 10.55, Concert of Light Music by the Vienna Station Octet, 11.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—12.15 p.m., See Frankfurt, 12.25, News, 12.35, See Stuttgart, 1.30, Talk: Highways of Germany which have made History, 1.50, Gramophone Concert: Strauss and Lanner Waltz Potpourri; Intermezzo, Trägende Glocken (Krome); Dance-Intermezzo, Sternschuppen (Kautler); Luna Walzer (Lincke); Serenade, The Blue Pavilion (Armandola); Der Zirkus kommt (Rust), 2.10, Review of New German Books, 2.30, Exchange, 2.50, Government Announcement, 3.0, See Leipzig, 4.0, Weekly West German Review, 5.0 to 5.35, See Frankfurt, 5.35, Reading from the Works of Eduard Stucken, 5.50, Announcements, 6.0, Transmission for all German Stations relayed from Frankfurt, 7.0, See Berlin (Deutschlandsender), 7.10, Konjunktur—A Comedy of the National-Socialist Revolution of 1933 (Dietrich Loder), 8.20, Programme to be announced, 9.0, See Frankfurt, 9.20, See Stuttgart, 9.30, News, Weather and Sports Notes, 9.45 to 11.0, See Stuttgart, 11.0, See Frankfurt, 12 Midnight (approx.), Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

Dance; Waltz, Geschichten aus dem Ebnstalt; Potpourri of Alpine Songs; Die Berge hoch, 9.0, News, 9.45 (approx.), The Arts under the New Regime—a Discussion between Erwin Freytag, the Painter, and F. W. Schmidt, the Author, 10.0, Concert Relay, 11.0 (approx.), Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., French Lesson, 6.30, History Talk, 7.0, Dance Music, 7.45, Concert of Slovene National Music by a Vocal Trio, with Guitar and Accordion Accompaniment, 8.45, Time and News, 9.0, Time, News and Dance Music, 9.30 to 10.0, Programme in English by the I.B.C. 9.30, International Broadcasting Club Concert; Selection from White Horse Inn (Stolz-Benatzky); Song: Stone-cracker John; Orchestra: You are my Heart's Delight (Lehár); Song: The Sergeant of the Line; Orchestra: Roses from the South (Strauss); Albumblatt; Song: Il Bacio (Arditi); Orchestra: Wine, Women and Song (Strauss), 10.0 (approx.), Close Down.

**LUXEMBOURG**

352 kc/s, 1,191 metres; 200 kW.—Belgian Evening, 7.0 p.m., Violin Concerto on Gramophone Records, 7.50, Talk: Children's Education, 8.0, Concert by the Radio Orchestra, conducted by Henri Pensis; Overture, Le roi Pa dit (Delibes); La jeunesse d'Herode (Saint-Saëns; Poem, No. 2, for Cello and Orchestra (Vreuls); Dance No. 5 (Granados); In the Steppes of Central Asia (Borodin); Air from The Czar's Bride (Rimsky-Korsakov); The Flight of the Bumble Bee (Rimsky-Korsakov), 8.50, News

OCT. 17th **TUESDAY** continued

of the Chickens coming out of their Shells, from Pictures from an Exhibition (Mussorgsky); The Flight of the Bumble Bee (Rimsky-Korsakov); Overture, The Merry Wives of Windsor (Nicolai). 8.10, Political Review. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Choral Concert. 9.45 (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

568 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopplavoro Notes, Tourist Talk, and Agricultural Report, and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Il Gobho del Califfo—Opera in One Act (Casanova), followed by La grotta di Troasova — Comic Opera in Two Acts (Salieri). Talk in the interval. 10.0, Giornale Radio.

**PARIS**

**POSTE PARISIEN;** 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Music. 7.15, Le Journal Parlé. 7.30, New Gramophone Records. 8.0, Talk on the Music Hall. 8.5, Film Review. 8.30, Concert of Music by Dutch Composers: Old Danzas (Rontgen); Chaconna gothica (Dopper); Three Songs (Treep); Symphonic Variations for Cello and Orchestra (Mengelberg); Overture, Trois Chevaliers (Voormolen); Rhapsody, Piet Hein (Van Anrooy); Overture, Cyrano de Bergerac (Wagenaar). 10.30, News.

**PARIS**

**RADIO PARIS, Call CFR,** 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m., Weather and Physical Culture. 7.45, Gramophone Records: La plus Belle (Darlay); Margotten (St. Leger); Marigold (Mayer); Preliud (Trobora). 8.0, Weather and Press Review. 12.0 Noon, Concert of Dances on Gramophone Records: Sarabande (Bach); Ochsenmuetz (Haydn); Rigaudon (Rameau); Gavotte from Armida (Gluck); Passepied from La Basoche (Messager); Pavane, Mazurka and Waltz from Isoline (Messager). 12.30 p.m., Recital of French Songs by Jeanne Pierly. 1.0, Exchange, News and Weather. 1.5, Gramophone Concert: Allegro from Symphony in B Flat (Schubert); Allegretto from Symphony in E (Mozart); Adagio from the Scottish Symphony (Mendelssohn); Largo from Xerxes (Handel); Scherzo from L'Apprenti sorcier (Dukas); Minuet from Symphony in G Minor (Mozart); Vivace from Symphony in D (Haydn). In the interval at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.50, Gramophone Music: Melody (Abraham); Manhattan (Alhouette); Accordade nomas (Along). 7.0, Theatre Review. 7.20, Gramophone Records: Celi qui mon coeur aime tant (Balay); Selection from La-haut (Yvain); Montonas regaladas (Carcassonne); Selection from The Bird-Fancier (Zeller); Green Eyes (Tchernoyarov); Air (Zimmermann); Overnight (Rose-Connelly). 7.45, Review of the British Press. 8.0, Gramophone Music: Three Airs from Le Couronnement de la Muse du Peuple (Charpentier). 8.15, Review by Bonnaud. 8.30, Marie-Victoria—Play in Four Acts (Maurice Maeterlinck). In the interval at 9.15, Press Review and News.

**PITTSBURGH**

**KDKA,** 980 kc/s, 306 metres; 50 kW. Relayed by W3XX on 48.85 metres and 25.27 metres.—7.30 p.m., KDKA Home Forum. 8.0, Programme to be announced. 8.15, Words and Music. 9.0, Betty and Bob, from New York Clubs. 9.0, Betty and Bob, from New York Clubs. 9.0, Betty and Bob, from New York Clubs. 9.30, News, Markets. 9.45, Talk, from New York. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News, Piano Classics. 11.15, Sports, Pat Haley. 11.30, Pittsburgh Spotlights. 11.45 to 12.30 (Wednesday), New York Relay. 11.45, Lowell Thomas. 12 Midnight, Amos n' Andy. 12.15, Marvellous Melodies. 12.30, What Would You Do? 12.45 to 2.30, New York Relay. 12.45, Carney's Dog Stories. 1.0, Crime Clues. 1.30, Adventures in Health. 1.45, Trade and Mark. 2.0, Musical Memories. 2.30, Programme to be announced. 3.0, Pedro Via's Orchestra, from New York. 3.30, Miniature Theatre, from New York.

**PORSGRUND.**—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Smetacek. Dance and Introduction to Act III from Sampson (Foerster); Variations for Harp, Op. 16, on a Theme of Mozart (Prochaska); Symphonic Legend, La Forêt enchantée (d'Indy); Overture, A Night on Karlstein, Op. 26 (Fibich). 3.35, Programme for Children. 4.15, Economic Report. 4.25, Gramophone Music. 4.35, German Lesson. 4.50, Gramophone Music. 5.5, Market Prices. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Song Recital by Irena Elsing. 6.0, Time and News. 6.10, Talk. 6.25, See Moravská-Ostrava. 7.25, A Drama of the Sea—Radio Play. 8.25, Concert by the

Station Orchestra, conducted by Parik. Soloists: Henri Marteau and Willy Schweyda (Violin). Overture for Small Orchestra (Myslivecek); Divertissement in B Flat (Mozart). 9.0, Time and News. 9.15, Concert of Light Music. 10.0 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**SOTTENS,** 743 kc/s, 403 metres, 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne). Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Geneva), Gramophone Music. 12 Noon (from Geneva), Financial News. 12.10 p.m. (from Geneva), Gramophone Music. 1.0 to 2.28, Interval. 2.28, Time Signal from Neuchâtel Observatory. 3.0 (from Lausanne), Concert by the Radio Lausanne Orchestra, conducted by Moser. 5.0 (from Lausanne), Programme for Women. 5.30 (from Lausanne), Literary Talk. 5.55 (from Lausanne), Theatre Notes. 6.20 (from Lausanne), Talk: The Protection of Beauty-Spots. 6.45 (from Lausanne), Radio Chronicle. 7.0 (from Lausanne), Cabaret Programme. 8.0, Eligomoz, or La Grippe politique—Comedy in Two Acts (Henri Tanner). 9.15, News and Weather. 9.20 (from Geneva), Talk: The Work of the League of Nations. 9.30 (from Lausanne), Dance Music. 10.15 (approx.), Close Down.

**RJUKAN.**—See Oslo.

**ROME**

**Call 1RO;** 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 582 kc/s, 453.2 metres, from 7.45 p.m.; and 2RO, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—11.30 a.m., Gramophone Concert. 12 Noon, Trio Concert from Turin. In the interval from 12.30 to 12.45 p.m., Giornale Radio and Exchange. 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15 to 5.0, Orchestral Concert: Dolly (Simonetti); Notturmo romano (Manno); Waltz, Non piangere pi (Serra); Marcia selvaggia (Florida); Liebeswalzer (Stolz); Sicilian Suite (Marinuzzi); Pifferata montanara (Culotta); Cosquillas (Furnari). 5.40 (Naples), Shipping and Sports Notes. 5.45, Morse Signals. 6.0, Tourist Report. 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Sponsored Music. 7.30, Sports Notes. 7.45, Variety Concert. Part I, Old Music. Soloist, Margherita Cossa (Songs); Concerto in D Minor for Mandoline quartet (Pergolesi); Four Songs (Bernardo Pasquini); Mandoline Quartet: (a) Minuet and Rondo (Bach), (b) Aria danzante (Durante); Presto from the Concerto in G Minor (Vivaldi). 8.30 (approx.), A.E.I.—Comedy in One Act (Sabatino Lopez). 9.0 (approx.), Concert (contd.). Part II: Selection from L'Amico Fritz (Maschagn). Part III, Gramophone Music: Overture, Coriolanus (Beethoven); Concerto in G Minor for Violin and Orchestra (Max Bruch); Intermezzo from Il carillon magico (Pick-Mangiagalli); Flower Waltz from Loreley (Catalani); Selection from Petroushka (Stravinsky). In the interval, Announcements. 10.0, Giornale Radio.

**SALZBURG.**—See Vienna.

**SCHENECTADY**

**WGY,** 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—12.45 a.m. (Wednesday), Stock Reports. 1.0 till Close Down, New York Relay. 1.0, Variety Programme. 1.30, Wayne King's Orchestra. 2.0, Ben Bernie's Orchestra. 2.30, Popular Programme. 3.0, Lives at Stake. 3.30, Popular Programme. 3.45, National Radio Forum.

**SCHWEIZERISCHER LANDESENDER**

**BEROMUNSTER,** 653 kc/s, 459 metres; 60 kW; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—6.50 to 6.5 a.m. (from Berne), Gymnastics. 11.0 (from Zürich), Light Orchestral Concert. 12.25 p.m. (from Zürich), Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Zürich), Concert by the Small Station Orchestra, conducted by Scherbaum. 3.0 (from Lausanne), See Radio-Suisse Romande. 5.0 (from Berne), Gramophone Concert. 5.30 (from Berne), Programme to be announced. 6.0 (from Berne), Time, Weather and Talk for Schools. 6.10 (from Berne), Talk: Sunday Excursions. 6.20 (from Berne), Song Recital in Three Languages by Lotte Gassner, with Violin Obligato by Lily Kylewer. 6.45, Concert by the Station Orchestra. 7.15 (from Berne), Variety Programme. 8.0, Weather and News. 8.10 (from Berne), Radio Play in Dialect. 9.15 (approx.), Close Down.

**SOTTENS.**—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Ostersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—1.45 to 2.10 p.m., Broadcast for Schools. 4.5, Programme for Children. 4.30, Song Recital by Nils Bridell. 4.45 (from Göteborg), Light Orchestral Music: Overture, Maritana (Wallace); Waltz from Eine Ballnacht (O. Strauss); Selection from Tannhäuser (Wagner); Wiegenlied (Dvorák-Kreisler); Piece (Sjöberg); March Potpourri (Robrecht). 5.45, French Lesson. 6.15, Weather and News. 6.30, Talk: International Affairs. 7.0, Recital of Negro Spirituals by Niels Juul. 7.30, Talk. 8.0 (from Göteborg), Choral Concert, conducted by Werther Carlsson: Sanctus (Palestrina); Kyrie (Lotti); Maria welt zum Herlingtum; Two Songs from the Marienlieder, (a) Ruf zur Maria, (b) Der Jäger (Eccard); Agnus Dei (Söderman); Sunday Morning (Wiedein). 8.25, Reading (Goethe). 8.45, Weather and News. 9.0, Operetta Music on Gramophone Records. 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Light Music on Gramophone Records. 12 Noon, Orchestral Concert of Light Music, conducted by Roskam. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Gounod Anniversary Programme. Concert by the Station Orchestra, conducted by Maurice de Villers: Ballet Music from Cinq Mars; Chanson de printemps; Selection from Mirella; Ballet Music from Romeo and Juliet. 2.0, Interval. 4.45, Talk on the French Colonies: Guinea. 5.0, Orchestral Concert, conducted by Roskam: Marche des Sans-flistes (Pischeck); Waltz, Dreams on the Ocean (Gungl); Serenade (Gyldmark); Albumblatt (Gyldmark); Romantic Overture (Kéler-Béla); Selection from Mignon (Thomas); Liebeslied (Hollmann); Waltz Intermezzo, Divine caresse (Bosc); Caprice (Van Herck); Marche joyeuse (Gueüol). 6.0, History Talk: The Empress Josephine's Childhood in Martinique. 6.15, Topical Talk. 6.30, Chopin Anniversary Programme: Rondo for Two Pianos; Pianoforte Solos: Introduction and Polonaise for Cello and Pianoforte; Pianoforte Solos. 7.30, Time and News. 7.45, Gramophone Records. 8.0, Press Review in German and Lottery Results. 8.30, Programme from Paris (Eiffel Tower). After the Programme, Press Review in French.

**STUTTGART**

**MUHLACKER,** 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 576 metres.—12.15 p.m., See Frankfurt. 12.25, News and Weather. 12.35, Concert by the Station Orchestra, conducted by Gustav Görlich. 1.30, Welfare Work among the Young Hitlerites—Report from the (Charité), Berlin. 2.0, Military Band Concert: Overture, Im Reich des Indra (Lincke); Waltz from Der Obersteiger (Zeller); Intermezzo (Powell); Potpourri, Von Bühne zu Bühne (Fétras); Die Puppenhochzeit (Siede); Song, Noch sind die Tage der Rosen (Baumgartner); Xylophone Solo, Serenade (Metra). 3.0, See Leipzig. 4.0, See Munich. 5.0 to 5.35, See Frankfurt. 5.35, Talk: The Fight against Crime. 5.50, Time, Weather and Market Prices. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, See Berlin (Deutschlandsender). 7.10 to 9.0, See Langenberg. 9.0, See Frankfurt. 9.20, Talk: You must know... 9.30, Local News. 9.45, Concert of Light Music. 10.0, Orchestral Concert, conducted by Gustav Görlich. Soloists: Ilermann Lingor (Tenor) and Hans Hofele (Baritone). Florentine March (Fueick); Overture, Poet and Peasant (Suppé); Two Pieces (Löns-Blume): (a) Grün ist die Heide, (b) Der Birnbaum blüht; Meditation (Bach-Gounod); Song from the Cousin from Nowhere (Künneke); The Blue Danube (Joh. Strauss). 11.0, See Frankfurt. 12 Midnight, Close Down.

**SUNDSVALL.**—See Stockholm.

**TOULOUSE**

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Popular Songs. 6.30, Music by an Argentine Orchestra. 6.45, Talk: Roquefort Cheese. 7.0, Songs from Sound Films. 7.15, News. 7.30, Ballet Music from Coppélia (Delibes). 7.45, Opera and Opéra-Comique Music: Scintille diamant, from Les contes d'Hoffmann (Offenbach); Je suis l'oiseau, from Grisélidis (Massenet); Invocation à la nature, from La Damnation de Faust (Berlioz); Il fait beau voir ces hommes d'armes, from Le jongleur de Notre Dame (Massenet); Aria from The Valkyrie (Wagner); Aria from William Tell (Rossini); Aria from Tosca (Puccini); Je vais danser en votre honneur, from Carmen (Bizet). 8.15, Military Music. 8.30, Accordion Solos. 8.45, Operetta Music: Selection from Eva (Lehár); Selection from The

Dollar Princess (Fall); Viennese Operetta Revue (Robrecht). 9.0, Music Hall. 9.30, Light Music. 9.45, Songs from Sound Films. 10.0, Viennese Music. 10.15, North African News. 10.30, Concert for Listeners in Morocco. 11.0, Airs from Operettas. 11.15, Dance Music. 12 Midnight, News. 12.5 a.m. (Wednesday), Light Music. 12.15, Orchestral Pieces. 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

**TRONDHEIM.**—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Dance Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopplavoro Announcements, and Gramophone Music. 6.0, Time, Report of the Royal Geographical Society, and Gramophone Music. 6.10, Agricultural Notes, and Wheat Market Prices. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio, Sports Notes, and Weather. 7.25, Introductory Talk to the following Transmission. 7.30, An Operetta in Three Acts. In the intervals, Talk and Art Notes. After the Operetta, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—11.0 to 11.15 a.m., Religious Information in English. 8.0 to 8.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m., Music of the Austrian Alps—Gramophone Concert. 10.55, Weather. 11.0, Concert by the Wiener Symphoniker, conducted by Josef Holzer. Soloist: Jaro Schmeidt (Violin). 12 Noon, Time and News. 12.10 p.m., Concert (contd.): Three Fanciful Etchings (Kettelbey); Overture, Meine Jugend (Lehár); Waltz, Unsere Frauen (Fahrwach); Song, Man steigt nach! (Fall); Idyll, In der Gebirgsschenke (Labitzky); Ich weiss ein gar heimliches Plätzli (Stolz); Waltz Intermezzo, Du liebe hold! (Meisterin (Eysler); Potpourri, Heut ist heut! (Recktenwald). 2.0, Time and News. 2.20, Talk on Photography. 2.35, Programme for Children. 3.0, Ravel Concert on Gramophone Records. 3.40, Handwork Lesson. 4.10, Chess Talk. 4.25, Johannes Evangelista Habert Concert by the Vienna Chamber Choir, conducted by Dr. Andreas Weissenböck. Soloist: Robert Günter. Introductory Talk by Franz Moissi; Das Mutterherz; Märzsturm; Wie ist doch die Erde so schön; Offeratorium, Improperium; Introitus; Rorate; Communio, Ecce Virgo; Kyrie, Sanctus and Agnus Dei from the Mass, Op. 73. 5.5, Talk: Ernst Rüdiger, Count Starhemberg and his Nephew, Guidoald. 5.30, French Lesson. 5.50, Talk: Occupations and Social Standing in the Past and Present. 6.15, Time and News. 6.25, Relay from the Vienna State Opera House. News in the interval. 9.5, Announcements. 9.15, Variety Programme by The Four Funny Fellows, relayed from the Oase.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Concert by a Mainline Orchestra, conducted by Szczeglow. 11.30, Radio Journal and Weather. 11.33, Concert (contd.). 12 Noon, Interval. 2.30 p.m., Economic Notes. 2.40, Talk, with Gramophone Illustrations: The Quartets of Beethoven. 3.25, News. 3.40, Answers to Correspondence. 3.55, Violin and Song Recital, by Zarzycka and Peter. Violin Solos: (a) Catalonian Song (Albeniz-Dusikin). (b) Caprice viennois (Kreisler); Arias from: (a) The Girl of the Golden West (Puccini). (b) I Pagliacci (Leoncavallo). (c) Tosca (Puccini); Violin Solos: (a) Nocturne in E, Op 27 (Chopin). (b) Scherzo Tarantella (Wieniawsky); Songs: (a) Core ingrato (Cordillo). (b) Mattinata (Leoncavallo). (c) Melody (Kratzer). (d) The Coral of your Lips (Marczewski). 4.50, Agricultural Notes. 5.0, Talk. 5.20, Light Music from the Adria Café. 6.5, Miscellaneous Items. 6.25, Topical Review. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Concert by the Station Orchestra, conducted by Nawrot. Soloist: Mankiewicz (Songs). Spanish March (Gyldmark); Suite, Reminiscences of Cairo (Armandola); Songs; Amoros (Bayer); Waltz from an Operetta (Jacobi); Swedish Song (Svendsen); Songs; Tarantella (Solazzi); Waltz, Flirtation (Steck); Mazurka (Namysłowski). 8.0, Reading (Knut Hamsun). 8.15, Concert of Lithuanian Music by the Station Orchestra, conducted by Oziminski, with Introductory Talk and Gramophone Interludes. 9.15, Sports Notes. 9.25, Dance Music from the Oaza Café. In the interval at 10.0, Weather and Police Notes.

**ZURICH.**—See Schweizerischer Landessender.

WEDNESDAY
OCTOBER THE EIGHTEENTH

ALGIERS

4 kc/s, 364 metres; 13 kW.—7.20 p.m., Popular Songs, 7.55, News, 8.0, Time and Lottery Results, 8.10, Symphony Concert: First Symphony (Beethoven); First Suite from L'Arlesienne (Bizet), 8.45, News, 8.50, Songs on Gramophone Records, 9.0, Concert (cont.); Selection from La Redemption (Franck); Cello Solo, Kol Nidrei (Bruch); Selection from La vie du Poete (Charpentier); Selection from The Mastersingers (Wagner), 9.30, News, 9.35, Sketches, 9.55, News.

ATHLONE

5 kc/s, 413 metres; 60 kW. Relayed by Ark, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Report, and Gramophone Concert, 6.0, Programme for Children, 6.45, News, 7.0, Celtic Talk, 7.15, German Lesson, 7.30, Time Signal, 7.31, Concert of Folk Music from the Station Orchestra, 8.0, Folk Songs, Mme. Ritter (Soprano), 8.15, Talk: Sacred Places of Ireland, 8.35, The Station Orchestra, 8.50, Variety Items by Fay Sarant, 9.30 to 10.30, Programme by the B.C. (Ireland), Ltd., 9.30, Orchestral Suite: Poupée valseante (Poldini); Selection on Manon (Massenet); Song: The Floral (Moss); Violin Solo: Valse bleuet (Prigo); Wireless World Announcement: L'Éme (Fibich); Song: The Lute Player (Jettson); Black Eyes (Ferraris); Morgenlütter (Strauss), 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd.: When my little Pomona (Little); That's all that matters (Lep); Hushtin' and Bustlin' for Baby (Goods); Racing Commentary: Then the one came out (Miller); Flor de Cuba: Tocht (Valero); Street of Dreams (Young), 10.30, I.B.C. Goodnight Melody, followed by News and Weather, 10.40, Dance Band Music, 11.0 (approx.), Close Down.

BARCELONA

AJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Selection from I Pagliacci (Verdi); Berceuse (Rimsky-Korsakov); Romance (Schmalstieg); Dance from Die Pfefferkuchen (Bayer); Prelude in F, No. 13 (Chopin); Minuet (Meyer); Selection from the Magic Flute (Mozart), 7.0, Request Gramophone Records, 7.30, Exchange and Gramophone Music (cont.), 8.0, Gramophone Music and News, 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices, 9.5, Concert by the Station Orchestra: March (Lincke); Selection from the cantata (Guridi); Waltz (D'Ambrósio); Dance, Serpoulette (Michele); Rhapsody (Saint-Saëns); Overture, Maritima (Wallace), 10.0, Relay from the Ayuntamiento.

BARI

12 kc/s, 269.8 metres; 20 kW.—12 Noon to 3.30 p.m., See Rome, 3.30, Programme for Children, 5.35, News in Albanian, 5.45 (approx.) till Close Down, See Rome.

LSLE.—See Schweizerischer Landessender.

BELGRADE

7 kc/s, 430.4 metres; 2.8 kW.—6.0 p.m., Concert by the Radio Orchestra, 7.0, Song Recital from Ljubljana, 9.3, Time and News Gramophone Music, 9.25, Cigány Music from the Potosaeka Zadruga Restaurant.

BERLIN

DEUTSCHLANDSENDER (Reichssender), 1.5 kc/s, 1,635 metres; 60 kW.—1.0 p.m., Gramophone Concert, Suite bergamasque (Debussy); Love Duet from Act I of Madame Butterfly (Puccini); Allegretto (Boccherini); Hungarian Dance, No. 5 in G Minor (Liszt); Lucia Laci, Rhapsody in B Minor (Liszt); Sonata in A (Brahms), 2.0, Concert by the Play for Children, 2.30, Weather Exchange and News, 2.45, Reading from Das Buch der Nacht (Paul Ernst), 3.0, See Hamburg, 4.0, Interview with Unpopular People (Dentist, a Bailiff, a Gasman, and an Inmate), 4.25, Violin Recital by Maria Neuss, Two Pieces (Beethoven): (a) Aria Neuss, Two Pieces (Beethoven); (b) Romance in B Flat, (c) Romance in F; Performance in B (Ries); Four Pieces (Suk); (d) Quasi ballata, (e) Appassionato (e) Un co' trionfo, (f) Burlesque; Introduction and Rantella (Sarasate), 5.0, Poems, 5.5, Religious Address and Organ Music, 5.30, Program for Germans, 5.50, Weather and News, 6.0, Transmission for all German Stations, relayed from Hamburg, 7.0, Tonia's Motto, 7.5, The Men of Norway—Duo Sequence from the Works of Kunt (Poul Heiter) (on Gramophone Records), 8.0, Round the World—Orchestral Concert, conducted by Eugen Sonntag, Swedish Wedding Procession (Frederiksen); Romaner in F major (Tchaikovsky); Finnish Folk Song, Jaahtaritaat (Eckmann); Japanese Lantern Festival (Yoshitomo); Chinesische Chitarr (Niemann); Spanish Caprice, Raina (Espinosa); Oriental March (Granados); Persian Scene, Am Zielhimmeln (Suk); Serbian Melody (Gal); Serenata stagiata (Marazziti); Hungarian March (Liszt); Ein Walzer aus Wien (Germann), 9.45, Weather and News, 9.45, Weather, 10.0, See Munich.

BERLIN

INKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—3.30 p.m., Orchestral Concert, relayed

from the Haus Vaterland: Selection from Madame Butterfly (Puccini); Ballgelder (Meyer-Helms); Selection from Die Geisha (Jones); Waltz, Wir sind heute so verknüht (Meisel); Overture, Im Reiche des Indra (Lincke); Ich hab amol ein Räuscher g'habt (Kapeller); Slow Foxrot, Ich wohl mein Lieb für heut (Boehmann); Waltz, 4.25, Liebe singen alle Geigen (Kauler), 4.25, Talk: New Film Stars—Louis Graveure, Leni Sponholz and Irmgard Willers, 4.45, Waldemar Wendland Song Recital by Else Jörn (Soprano), the Composer conducting: Der Wind; Es musste mich einer führen; Regen; Frauen; Ach, was ist die Liebe; Liebe; Ich will nicht zittern; Mädchen und Madama; Ich aber fühle; Unter den Rüstern; Frühlingsstag; Lockeliedchen, 5.5, See Berlin (Deutschlandsender), 5.40, Funkstunde informs its Listeners, 5.45, Topical Talk, 6.0, Transmission for all German Stations, relayed from Hamburg, 7.5, Recital of Folk Songs, 7.35, The Havel—A Variety Programme, 9.0, News, 9.15 (approx.), Dance Music, relayed from the Sprengarten, Treptow, In the interval at 10.0 (approx.), Report from Moabit, 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODD.—See Oslo.

BORDEAUX-LAFAYETTE

985 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal, 7.35, News, 7.40, Gramophone Music, 7.55, Lottery Results, 8.0, Agricultural Talk, 8.15, News, 8.30, Concert.

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.55 p.m., Hungarian Programme, Talks: (a) Experiences of a Reporter, (b) Sports Review, followed by Recital on Two Pianofortes, 5.55, Hints for Housewives, 6.0 till Close Down, See Prague, 9.15 (approx.), Close Down.

BREMEN.—See Hamburg.

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—1.10 p.m. (from Gleiwitz), Adolf Scorra Song Recital by Hans Kaufman (Bass), accompanied by the Composer; Und dennoch; Lied eines Auslandsdeutschen; Deutschland; Eine Kompanie Soldaten; Bergmännlein; Heimatwänder; Oberschlesierlein, 1.40, Old Dances and Waltzes on Gramophone Records, 2.0, Agricultural Prices, 2.15, Talk: The Long Distance Telephone, 2.30, Reading (Walter Schatz), 2.50, Talk on Silesia, 3.10, Concert by a Nazi Band, Soloist: Alfons Kabitzske (Cello); March, Unsere Marine (Friedemann); Cello Concerto (Klugharit); Gavotte, Pasteur amoureux (Aletier); Die Spieldose (Mandré); Fantasia on Themes from Verdi's Opera, La Traviata (Schreiner); Waltz, Lebensgeister (Manfred); March Potpourri, Deutschlands Erwachen (Kochmann), 4.15, Wireless Talk: The New German Wireless Receiver in Upper Silesia, 4.35, Concert of German Students' Songs by the Upper Silesian Quartet, 5.5, String Quartet in A minor, Op. 132 (Beethoven), by the Klingler Quartet, 5.50, Meat Market Prices, 6.0, Transmission for all German Stations, relayed from Hamburg, 7.0, News, 7.10, Request Concert by the Station Orchestra, conducted by Topitz: Prelude in C (Bach); Opening Choral from the Cantata, Es erhub sich ein Streit (Bach); Motet for Eight Voices (Mars); Hymn for Male Voice Choir, Wind Instruments, and Organ; Der Kelter ist nicht weit (Germann); Cantata for Eight-voice Choir and Orchestra: Nimm das Heil und die Kraft (Bach), 9.0, Austria, 9.20, Time and News, 9.45, Dance Music relayed from Linden-Diele, Mallnitz, 11.30 (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission; News and Talk on German Authors, 6.0, See Prague, 9.30 (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 590 kc/s, 503 metres; 15 kW.—12 Noon, Concert by the Max Alexys Orchestra, 1.0 p.m., Le Journal Parlé, 1.10, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Mademoiselle Dactylo (Raimund); Intermezzo from Le Pavillon d'Arnade (Tcherepnin); Waltz from The Rose of Stamboul (Fall); Selection from Miss Decima (Audrau); Violin Solo: Caprice viennois (Kreisler); Piccolo Solo: Le Merte blanc (Damaré); Suite, Mascarade (Lacôme), 5.0, Concert by the Radio Orchestra,

conducted by Charles Walpot: Rhapsody in B (Lartung); Hungarian Rhapsody No. 2 (Liszt); Rapsodie Dahomeyenne (de Boeck); Slav Rhapsody No. 2 (Friedemann); Chinese Rhapsody (Gabriel Marie); España (Chabrier), 6.0, Gramophone Music, 6.15, Le coeur et le Browning—Play in Three Acts (Rodo-Maliert), 7.0, Song Recital by Mme. Van Hout-Volekaert: Sérénade de l'Amant jaloux (Grétry); Air d'Isaac (Mouquet); Le bonheur est chose légère (Saint-Saëns); Berceuse (Gretchanov), 7.15, Extracts from the Sonata in D, Op. 12, No. 1 (Beethoven) on Gramophone Records, 7.30, Talk on Hygiene, 8.0, Concert by the Station Symphony Orchestra, conducted by Jean Kumps, Soloist: Henri Koch (Violin), Overture, Gwendoline (Chabrier); Violin Concerto in D (Beethoven); Carnival de Paris (Svendsen), 8.30, Un confident—Comedy in One Act (Max Deauville), 9.0, Concert (cont.): Overture, Figaro (Mozart); Nocturne (Brenta); Quartet for Horns (de Maleingram); Andante and Scherzo from the Symphony in D (Absil); Violin Solo: (a) Havanaise (Saint-Saëns), (b) Aria (Bach); Nursery Suite (Ingebrecht); Military March No. 3 (Schubert), 10.0, Le Journal Parlé,

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans, Soloist: Derissen (Cello), Overture, Tancredi (Rossini); Russian Rhapsody, Svetlana (Weksler); Bells across the Meadows (Ketelbey); Selection from The Pearl Fishers (Bizet); Tarantella for Cello (Popper); Waltz, Die Nachtschwärmer (Zielner); Noveltta (Caludi); The Mill in the Black Forest (Ellenberg); March (Berry), 1.0 p.m., Journal Parlé, 1.10, Concert by Max Alexys and his Orchestra, 5.0, Concert, relayed from the Century Hotel, Antwerp, 6.0, Gramophone Records: Two Fairy Eyes, from The Circus Princess (Kálmán); Volga Song from The Czardentch (Lehár); Schusichtstraum (Tate-Ronthal); Melody from Paganini (Lehár); Song from Prasquita (Lehár), 6.15, Talk: Popular Irish Songs, 6.30, Concert by the Small Station Orchestra, conducted by Leemans: Marche jubilaire (de Boeck); Suite campestre (Amadei); Réverie (La Gye); Ballet Scene (de Teyce); Selection from Pinocchio (Guiraud); Gavotte for Strings, Flute and Clarinet (Wigy); Tarantella for Pianoforte (Wigy); Petite suite miniature (Dubois); Descriptive Piece (Caludi), 7.15, Protestant Address, 7.30, Journal Parlé, 8.0, Concert by the Radio Orchestra, conducted by Walpot, Soloists: Mme. Bruyants and M. Vereamer (Songs) and Gras (Pianoforte), March, The Washington Post (Sousa); Overture, Poet and Peasant (Suppé); Songs with Orchestral Accompaniment; Prelude to and Intermezzo from Cavalleria rusticana (Mascagni); Songs; Potpourri of Cigány Music (Meyer-Helms), 8.45, Reading, 9.0, Concert (cont.): Egyptian March (Strauss); Rhapsody in Blue for Pianoforte and Orchestra (Gershwin); Songs; Two Flemish Dances (Bloekx); Songs with Orchestral Accompaniment; Neapolitan Dances (Desormes); Vocal Duet; Galop, Feu d'artifice (Demaels), 10.0, Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra: March (Fück); Waltz (Waldteufel); Overture, The Force of Destiny (Verdi); Selection from Don Giovanni (Mozart); Schubert Potpourri (Urbaeh), 5.0, Radio Journal, 5.10, Song and Pianoforte Recital, 5.30, Concert (cont.): Musical Pleasantries (William), 6.0, Educational Programme, 6.20, Orchestral Music on Gramophone Records, 6.30, Talk, 7.0, Violin Recital by Filomen, 7.30, Talk, 7.45, Songs by Mme. Nina Aureliana, 8.15, Cello Recital by Draghici, 9.0, Light Music relayed from a Restaurant.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 840 metres from 6.40 p.m. till Close Down.—3.0 p.m., Concert by the Lajos Kiss (Cigány) Band, 4.15, Talk, 4.45, Concert by Lesonczy Oscar Schweitzer and his Orchestra, 6.0, Reading, 6.40, An Operetta, 8.40, News, 9.0, Song Recital by Tibor Vitez, Aria from The Magic Flute (Mozart); Im Grab im stummen Grab (Beethoven); Monologue from The Mastersingers (Wagner); Am Meeresstrand (Schubert); Aria from La Bohème (Puccini); Song (Schumann), 9.30, Concert by the Alexander Farkas Cigány Band from the Café Bodo, Soloist: Dani,

CASSEL.—See Frankfurt.

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—

11.0 a.m., Time Signal and Chimes from the Town Hall, 11.2, Concert by the Leonard Gylmark String Ensemble, relayed from the Bellevue Strandhotel, 1.0 p.m., Interval, 2.0, Concert of Variety Music on Gramophone Records, 2.30, Concert by the Mogehs Hansen Instrumental Ensemble: Overture, Salvator Rosa (Gomez); Selection from The Rose of Florida (Fall); Spanish Waltz, Santiago (Corbin); Piece (Kronberger and Mariotti); Eine Frühlingmärchenzeit (Krome); Barcarola appassionata (Muzilli); Au soir de la vie (Pesse); Liebestraum (Liszt); Madrigalette (Bullerian); Sérénade (Cajani); Waltz Fantasia (Waldteufel); Sérénade badine (Gabriel-Marie); Syphiden (Lincke); Traversée heureuse (Fl. Schmitt); Piedmontese Serenade (Leopold); March, Sie kommen (Lincke). In the interval at 3.15 (approx.), Talk for Children, 4.30, Exchange and Fish Market Prices, 4.45, Talk, 5.15, French Lesson, 5.45, Weather, 5.54, Announcements, 6.0, News, 6.30, Agricultural Talk, 7.0, Time Signal from the Town Hall, 7.1, Sérénade in E (Dvorak), by the Radio String Orchestra, conducted by Lanny Gröndahl, 7.25, Talk, 7.55, Music from Holberg's Time—Recital by Erik Thomsen (Flute), Leo Hansen (Violin), and Folmer Jensen (Harpischord); Movement from the Sonata for Flute and Harpischord (Freit-hoff); Movement from a Harpischord Sonata (Scheibe); Folia con variazioni for Violin and Harpischord (Corelli), 8.20, Talk with Readings: Holberg's Epistles, 9.0, News, 9.15, Concert of Danish Music by the Radio Orchestra, conducted by Lanny Gröndahl; Overture, Erik Ejegod (Kunzen); Four Dances (Thiele, arr. Gröndahl); Overture, Et Evntyr i Roseneborg Have (Weyse); Morgenstemning from the Music to Hakon Jarl (Hartmann); Prelude to Syvsoverdag (Hartmann); Two Dances from the Music to Aladdin (Nielsen), 10.0, Dance Music by the Richard Johansen Band, relayed from the Ludvig Restaurant, In an interval at 11.0, Time Signal and Chimes from the Town Hall, 11.30 (approx.), Close Down.

CORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C. Happy Hour: Part I, Request Programme: Signature Tune; On the Quarter-deck (Alford); Fiddlin' Jo' (Kavanaugh); Love's Old Sweet Song (Molloy); Presto agitato—Moonlight Sonata (Molloy); Drinking Song from the Rose of Persia (Sullivan); Smilin' through (Penn); Londonderry Air (arr. Grainger); The Birth of the Blues (Henderson), Part II, Dance Music: At the Old Pig and Whistle; A Girl like Nina; Twelfth Street Rag; Since Maggie became Margaret; My Gipsy Rhapsody; I raised my Hat; I cover the Waterfront; Signature Tune, 12 Noon, Programme in French, 4.30 to 6.30 p.m., Programme in English by the I.B.C., 4.30, The Nursery Corner, 5.0, Quintet Concert for the Isle of Wight; Signature Tune; The Night by the Sea; Gavotte from Mignon (Thomas); Song, Reflections in the Water (Leeb); Ma Curly-Headed Baby (Chisam); Orientale (Glazounov); The Song of the Nightingale (Ailbott); Song, Fairy Tales of Ireland (Coates); Butterflies in the Rain (Myers); Cherry Ripe (Traditional), 5.30, Concert for Portsmouth and Southsea, Music Hall and Musical Comedy Memories; Selection from The Quaker Girl (Monckton); My Old Dutch (Chavallier); Songs made Famous by Harry Champion; Choral Selection from La Poupée (Andran); Gaiety Echoes; The Wink of the Old Glad Eye; After the Ball (Harris); Two Little Girls in Blue (Graham); Selection from Floradora (Leslie Stuart); Signature Tune, 6.0, Programme in French, 10.0 (approx.), Dance Music: Signature Tune; Bells of Normandy; Have you had a Good Day To-day?; The Shadow Waltz; Learn to Croon; Erie Moon; Dancing But-terfly; It's Sunday down in Caroline; Lover Waltz; Isn't it Heavenly?; My Lucky Day; Avalon; Bugle Call Rag; Oh! Johanna; Sandown in a Little Green Hallow; Lazy-bones; I sign for you, Rio Rita; Sweet Dreams, Pretty Lady, 11.0, Talkie Time: Signature Tune; Sittin' in the Dark; You are too Beautiful; There'll still be Love; Heaven will protect an Honest Girl; Hits from Forty-Second Street; Adorable; There's Magic in the Air; Selection from Puttin' on the Ritz; I got Rhythm; Signature Tune, 11.30, A Gramophone Concert: Pictorial Records: When my Little Pomeranian (Little); My Wishing Song (Burke); Old Spotted Cow (Krome); Spanish Sweetheart (Evans); Heaven will protect an Honest Girl (Wuston); Pianoforte Solo; Selection from A Bedtime Story; Song of the Tramp (Sievier); I lay me down to sleep (Wabel), 12.5 a.m. (Thursday), Late News Bulletin in English, 12.10 (approx.), Club Concert for Rochester Listeners: Signature Tune; Mad Moments (Hopkins); The World is so Small (Nesbitt); Play, Fiddle play (Lawrence); Jack-in-the-Box (Ghand); The Japanese Sandman (Whiting); Signature Tune; I'll show you off (Hammerstein); Down in the Valley (Harrington); Reflection in the Water (Webster); My Gal Sal (Dresser); Happy Ending (Parr-Davies);

OCT. 18th **WEDNESDAY** continued

What a Lady Josephine must have been (Pola); I raised my Hat (Franz); P.C. 123—The Policeman's Song (Butler). 1.0, Dance Music: Signature Tune; The Bells of Normandy; Under a Blanket of Blue; Twelfth Street Rag; Sweetheart Darlin'; Peter, Peter; Down the Old Ox Road; Stay out of my Dreams; I always keep my Girl out Late; Love is the Thing; At the Old Pig and Whistle; Nobody's Sweetheart; Love Songs of the Nile; From me to you; I wish I had Wings; Someone stole Gabriel's Horn; Spanish Eyes; Let's call it a Day. 2.0, I.B.C. Good-night Melody and Close Down.

**FLENSBURG.**—See Hamburg.

**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35, Concert from Stuttgart. 1.30, Finland, the Land of a Thousand Lakes—Programme for Young People. 2.30, Weather Forecast. 2.40, Time and Market Prices. 3.0, Concert from Stuttgart. 5.0 to 5.35, See Langenberg. 5.35, Talk: The American and German Youth Movement. 5.50, News. 6.0, Transmission for all German Stations, relayed from Hamburg. 7.0, Topical Talk. 7.40, Variety Programme. 9.0, News. 9.20, See Stuttgart. 9.30, Time and News. 9.45, Light Music. 10.0, Serenade. 11.0, See Stuttgart. 12 Midnight, Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., Concert by the Hamburg Philharmonic Orchestra, conducted by Secker: Overture, Am Rhein (Kaun); Mephisto-Walzer (Liszt); Irish Rhapsody (Stauford); Valse triste (Sibelius); Extracts from The Kingdom of Pau (Graener); Overture, In Autumn (Grieg). 4.0 (from Kiel), Reading of Animal Stories (Ehrke). 4.30, Topical Talk. 5.9, Concert of Dances by the Small Station Orchestra, conducted by Maasz: Spanish March (Gyldmark); Russian Dance No. 2 (Bullerian); Slav Dance No. 12 (Dvorak); Hungarian March (Schubert); Swedish Dance (Anlin); German Dances (Rezer); Three Dances from Bavaria (Paclerneck); Radetzky March (Jos. Strauss). 5.40, Frankfurt Exchange and Hamburg Market Prices. 5.50, Weather. 6.0 (from Bremen), Transmission for all German Stations: Concert from Bremen Cathedral: The Symphony Orchestra, the Cathedral Choir, and the Bremen Teachers' Choral Society; Soloist, Kate von Tricht (Organist); Prelude in C for Organ (Bach); First Choral from the Cantata, Es erhub sich ein Streit (Bach); Motet for Eight Voices, Werkleute sind Wir. Op. 6 (Karl Marx); Male Voice Choir: Hymn, Der Retter ist nicht weit, Op. 95 (Graener); Michaelmas Cantata for Eight Voices and Orchestra, Nun ist das Heil und die Kraft (Bach). 7.0, De grote Not—Dialect Play in Five Scenes (Möhring). 8.20, Gramophone Music. 9.0, Time, Weather and News. 9.20 (from Bremen), Cello Recital by Schulz-Fürstberg: Variations on a Theme from Mozart's Magic Flute (Beethoven); Andante (Schulz-Fürstberg); Mitterl (Zschorli); Guitar (Moszkowsky). 9.50, From Lanner to Lilling—Concert by the Small Station Orchestra, conducted by Secker; Soloist, Gustav Zippel (Vibraphone); March, Schneidige Truppe (Lehnhardt); Waltz, Die Pesthler (Lanner); Dream Pictures (Lumbye); Overture, Lysistrata (Lincke); Indian Suite (Lilling); Vibraphone Solo: Romance (Löhr); Potpourri, The Three Strausses (Lindemann); Overture, Wiener Frauen (Lehár).

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert of Serenades. In the intervals at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.20, Hints for the Housewife. 2.30, Programme for Children. 3.0, Concert by the Small Station Orchestra, conducted by Wilcken; Prelude to The Cricket on the Hearth (Goldmark); Suite der Freude (Scheinflug); Fantasia, Old Russia (Leuchner); Waltz from Die Puppenreise (Bayer); Selection from The Hermit's Bell (Mailart); Overture, Die Infahrt ins Glück (Suppé); Selection from Der Feldprediger (Miffelker); Waltz from Der Rastelbinder (Lehár); Reminiscences of Verdi (Worch). 4.35, Programme in Memory of

the Battle of Leipzig, October 16-19, 1813. 4.50, Talk for Parents. 5.15, Agricultural Prices. 5.25, Song Recital by Paul-peter Rafalski: Der König in Thule (Zelter); Im Rolandsbogen (Mania); Im tiefen Keller (Fischer); Die Drei Reiche der Natur (Berger); Der Saug ist verschollen (Sommer); Der Schlesische Zecher und der Teufel (Reissiger); Die bange Nacht ist nun herun (Lyra); Wohlauf Kameraden (Zalm). 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Hamburg. 7.0, News and Weather. 7.10, Dance Music by the Small Station Orchestra, conducted by Wilcken and the Börschel Dance Band. 9.0, News, Weather, and Sports Notes, followed by Concert Relay. 11.0 approx., Close Down.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m., and 20 kW. (from 5.40 p.m.)—11.40 a.m. till Close Down. Programme of the Workers' Radio Society (V.A.R.A.). 11.40, Concert by the Small Station Orchestra, conducted by de Groot. 1.40 p.m., Interval. 1.55, Orchestral Concert. 2.40, Programme for Children. 5.10, Concert by the Station Orchestra, conducted by de Groot: Overture, The Merry Wives of Windsor (Niccolai); Alt-Wiener Reigen (Strauss); Moorish Serenade (Chapi); Selection from Tieffand (d'Albert); Spanish Dances (Moszkowsky); Oms orkest (de Groot); Xylophone Solo (Krüger); Caprice viennois (Kreisler); Le cygne (Saint-Saëns); Poissonaise (Schreiner); Gavotte (Popper); The Music Box (Lindsay); Carnival in Venice; Minnet (Bizet); Polka (Komst); Selection from Martha (Flotow); La tourterelle (Deinaré); Grossmütterchen (Lange); The Clock is Playing (Blaauw); Melody (Rubinstein); Idylle ecossaise (Saint-Saëns); Air from Henry VIII (Saint-Saëns); Humoresque (de Groot); Melody (Mayerl); Russian Dance; Get a Load of This (Stillwell); Twelfth Street Rag (Wiedoff); The Toy-maker's Dream (Golden); Say it with Music (Berlin). 6.40, Talk. 7.0, Concert by the V.A.R.A. Orchestra, conducted by de Groot: March, Friendship (Sonsa); Tesoro mio (Becucci); The Mill in the Black Forest (Ellenberg); Selection from The Tales of Hoffmann (Offenbach); Im Spielwarenladen (Jessel); Valse poudrée (Popy); The Gladiators' Farewell (Blankenburg). 7.35, S.O.S. Announcements. 7.40, News. 7.50, Orchestral Concert (contd.): Overture, Banditenstreich (Suppé); Waltz, Herbstrosen (Strauss); Ballet Music from Ritter Pasman (Joh. Strauss). 8.20, Concert by the Bel Canto Male Voice Quartet. In an interval at 8.40, Radio Play (Heyermansvan Duin). 11.0, Organ Recital by Jong. 11.20, Gramophone Music. 11.40 (approx.), Close Down.

**MORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres, 7 kW. (until 3.40 p.m.). Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—Programme of the Christian Radio Society (N.C.R.V.). 12.10 p.m., Concert by the Van der Horst Ensemble: Overture, Pique Dame (Suppé); Waltz, Wiener Bürger (Zelner); Selection from Werther (Mascnet); Selection from Piccolino (Gisraud); Gramophone Music: Overture, Masaniello (Auber); L'étoile du nord (Waldteufel); Danse macabre (Saint-Saëns); Potpourri, A. B. C. (Komzak). 1.40, Programme for Children. 2.25, Religious Address. 2.55, Concert by the Delft Trio: Trio, Op. 70, No. 1 (Beethoven). 3.25, Interval. 3.40, Concert (contd.): Hebrew Song (Castellano-Tedesco); Andantino (Martini-Kreisler); Andalusian Romance (Saraste); Gramophone Music: Trio, Op. 38 (Gretchaninow). 4.40, Programme for Children. 5.40, Agricultural Talk. 6.10, Programme to be announced. 6.40, Police Report. 6.55, Ecclesiastical Notes. 7.10, Talk on Russia. 7.40, Concert arranged by the Missionary Society at Oegstgeest: Soloists: Smit Duyzentkunst (Baritone) and Mude (Organist); Toccata and Fugue in D Minor (Bach); Choir: Gott sei mir gnädig (Mendelssohn); Chorus from Elijah (Mendelssohn); Address; Psalm 103; Address; Bussied (Beethoven); Grand Gloria (Bortniansky); Andante con moto (Pomper); Missionary Hymn (Zwart); Improvisation (Mudde). 9.10, News. 9.20, The Messiah—Oratorio (Händel) by the British Broadcasting Company's Choir and Orchestra, conducted by Sir Thomas Beecham (on Gramophone Records). 11.10 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—10.0 a.m., Broadcast for Schools: German Men of

Letters—Kleist. 10.25, Sponsored Programme with Gramophone Music. 10.55, Weather. 11.0, Dances of the Nations—Concert by the Station Orchestra, conducted by Buschkötter: German Dances (Schubert); Hungarian Dances (Brahms); Spanish Dance (Granados); Slav Dances (Dvorak); Norwegian Dance (Grieg); Russian Dance (Napravnik); Old Dutch Dance (Siep). 12.15 p.m., See Frankfurt. 12.25, News and Weather. 12.35, See Stuttgart. 1.30, See Frankfurt. 2.30, Economic Notes. 2.50, Political Announcement. 3.0, See Stuttgart. 5.0, German for Germans. 5.20, Talk: The Racial Question. 5.35, Talk: The Latest Developments in Science and Technology. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from Hamburg. 7.0 to 9.20, See Frankfurt. 9.20, See Stuttgart. 9.30, News, Weather and Sports Notes. 9.45 to 11.0, See Frankfurt. 11.0, See Stuttgart. 12 Midnight, Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0, Concert by the Ende Orchestra: March (Kochmann); Prelude and Siciliana from Cavalleria rusticana (Mascagni); Illentänze (Ellenberg); Slow Waltz, The First Letter (Reggos); Selection from Paganini (Lehár); Minnet in A (Bocherini); Ballet Suite, Ein Fest im Gnomereich (Wisteborn); Melody (Meisel); Neapolitan March (Gastaldon); Waltz, Goldschmidts Töchterlein (Fétras); Hungarian Dance (Drlla); Selection from The Geisha (Jones); Xylophone Solo, Polka Mazurka (Ramthor); March, Deutscher Geist (Zettl). In the interval at 12.15 p.m., News and Programme Announcements. 1.0, News. 1.40, Radio Report of the Fisheries at Horst. 2.0, Talk: The Joiner's Craft. 2.15, Talk: Old Coach Roads and New Motor Roads. 2.35, Economic Notes. 3.0, Programme for Young People. 4.50, News, Weather, and Time. 5.0, Song Recital by Alfred Kase: German Festival Song (Schiebold); Snerspruch (von Hausegger); Klage (Piltzer); Two Songs (Kiessig): (a) Unterm Hauskruzfiskus, (b) Magna Mater; Four Poems by von Selchow (Riedel): (a) Für mein Volk, (b) Mein Schwur und Gehet, (c) Der Mann an der Tür, (d) Nach vorwärts schau'n. 5.30, Book Review. 5.50, Review of the Day's Events. 6.0, Transmission for all German Stations, relayed from Hamburg. 7.0, Talk: The Battle of Leipzig, 16th-18th October, 1813. 9.0, News. 10.0, Concert on Old and Modern Instruments (on Gramophone Records).

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0, Religious Talk. 6.30, Literature Lesson. 7.0, Song Recital. 7.45, Flute Solos. 8.30, Concert by the Station Orchestra. 9.0, Time, News, and Dance Music. 10.0 (approx.), Close Down.

**LUXEMBOURG**

352 kc/s, 1,191 metres; 200 kW.—Luxembourg Evening. 7.0 p.m., Symphony No. 3—the Eroica (Beethoven) on Gramophone Records. 8.0, Quartet for Oboe, Violin, Viola and Cello (Mozart). 8.20, Concert by the Radio Orchestra, conducted by Henri Pénis: Carnival Overture (Dvorak); Spanish Suite (Albeniz-Salabert); Galop (Liszt). 8.50, News. 9.0, Song Recital. 9.30, Concert by the Radio Orchestra: March, Letzeburg de Letzeburger (Albrecht); Danse des petites poupées (Mertens); Ballade (Foss). 9.50, News in German. 10.0, Gramophone Music. 10.15, Dance Music.

**LWOW**

788 kc/s, 381 metres; 16 kW.—6.5 p.m., Announcements and Gramophone Music. 6.25, See Warsaw. 6.40, Programme Announcements. 7.0, See Warsaw. 10.5, Gramophone Music. 10.30 (approx.), Close Down.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.40 a.m., Radio Gazette for Lyons and the South-East. 8.30, Décalage (Denys Amiel). After the Programme, News.

**MADRID**

ARANJUEZ; EAQ; 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Popular Music. In the interval at 10.45, Radio Chronicle. 11.40, Light Music. 12 Midnight till Close Down. Programme in English by the I.B.C. Conducted by the International Broadcasting Company (Ireland), Ltd., on behalf of the Hospitals Trust, Ltd. Signature Tune: Come back to Erin, Dream Waltz; It's just the same to me; Humming to myself; Rosa del Rio; The Land of Smiles; Kilma Waltz; Tiptoe through the Tulips; Arrogancia Andaluza; Signature Tune: Come back to Erin. 12.30 a.m. (Thursday), I.B.C. Good-night Melody.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—p.m., Chimes, Exchange, Programme 1 Women, Poetry Reading, and Requiem Gramophone Music. 8.15, Topical Review. 8.30, Interval. 9.30, Chimes, Time, a Topical Review. 9.40 (approx.), Concert the Philharmonic Orchestra, conducted Pérez Casas. 11.45, Topical Review. Midnight, Chimes and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m. Concert by the Station Orchestra, conducted by Plichta. Selection from Pagliacci (Leoncavallo); Waltz from D. Rosenkavalier (Richard Strauss); Polonelle (Prozanski); Egyptian Dance (Friml) Selection from The Flower of Haw (Abramiam); Vampire Dance (Smatek) March (Drabek). 3.50, See Prague. 4. Gramophone Music. 4.45, See Prague. 4. Gramophone Music. 5.0, Talk. 5.15, 5. Prague. 5.25, Concert by a Country Band. 6.0 to 9.15. See Prague. 9.15 (approx) Close Down.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather Forecast. 1. p.m., Weather Report. 2.0, Concert of Light Music with Talk. 3.0, English Lesson. 3. Readings by Poets and Authors from their own Works, followed by Reading from The Snow Storm (Pushkin). 4.30, Dramatic Programme for Young People. 5.30, Tchaikovsky Concert, conducted by George Selianian. Symphony, No. 1; Songs; Symphony No. 6. 8.0, News. 8.30, Programme 2; announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed Augsburg and Kaiserslautern, 536 kc/s, 533 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Concert by the Quirin Hall Orchestra: Overture, Hoens-Poens (Leusner); Selection from The Mikado (Sullivan) Waldstaden (Heineke); Potpourri Wiener Leben (Komzak); Waltz Intermez: Blütenzauber (Lindsay-Theimer); Travel Pictures from Old China (Percy); March, Friedenfeuer (Blankenburg). 4.45 (from Nürnberg), Talk: Bavarian Soldiers in Greece. 5.5, Four Pianoforte Pieces, Op. 8 (Lamp) played by Julius Müller. 5.25, Reading: The Cape of Good Hope (Rohrbach). 5. Time, Weather and Agricultural Notes. 6. Transmission for all German Stations, relayed from Hamburg. 7.0, Service for Customers—Variety Programme, followed Dance Music. 9.0, Austria. 9.20, Tin Weather, News and Sports Notes. 10. Serenade, conducted by Erich Kloss. 1 (approx.), Close Down.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 44 metres.—4.0 p.m., Gramophone Concert. Classical Music. 5.0, French Lesson. 5. Programme for Girls. 6.0, Announcement Weather and News. 6.30, Talk arranged by the University. 7.0, Time Signal. 7.1, Tracts from Peer Gynt (Grieg) by the Station Orchestra. 8.0, Hermann Wessel Programme—Talk and Recitations, relayed from Bergen, 824 kc/s, 364 metres. 8.30, Agricultural Notes and Weather Report. 8. News. 9.0, Topical Talk. 9.15, Vocal a Instrumental Concert. 10.0, Dance Music on Gramophone Records. 10.30 (approx) Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Do-lavoro Notes, Tourist Talk, Agricultural Report and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time a Announcements. 7.45, Orchestral Concert Soloists, Hella Helt Di Gregorio (Soprano) and Castagna (Bassoon); Overture, Così f tutte (Mozart); Soprano Solos: (a) Hinn Song (Rimsky-Korsakov); (b) Song a Serenade (Freire); A Night on the Mountain (Mussorgsky); Talk; Bassoon Concerto (Mozart); Selection from Il carill magico (Pleck-Manginalli); Soprano Solo: (a) La pastorella delle Alpi (Rossini); (b) Il bacio (Arditi); Selection from L'Arleone (Bizet). After the Concert, Light Music. 10.0, Giornale Radio.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Popular Russian Songs (Gramophone Records). 7.15, Le Jour Parle. 7.30, Concert. 8.5, Talk on Economics. 8.30, L'Age de raison—Play in Three Acts (Paul Violar). 10.30, Dance Music 11.0, News.

OCT. 18th **WEDNESDAY** continued

**PARIS**

**RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m.,** Weather and Physical Culture. 7.45, Gramophone Records: Songs of the Ardennes (Jacquemain); La Joumard (Moreau); March (Faregoud). 8.0, Weather and Press Review. 12 Noon, Educational Talk. 12.15 p.m., French Opera Music on Gramophone Records: Introduction to Act I of Fervaal (d'Indy); Symphonie Entr'acte from Messidor (Bruneau); Ballet Music from Le Miracle (Huc). 12.30, Organ Recital, relayed from the Gaumont Palace: My oh my (Revel); Firt (Pippe); Suite, Hyde Park (Jalowiez); Night and Day (Porter). 1.0, Exchange, News and Weather. 1.5, French Opera Music on Gramophone Records (cont'd.); Two Airs from Donna Vanna (Fevrier); Extracts from Pelléas et Mélisande (Debussy); Two Melodies from Ariane et Barbe-Bleue (Dukas). In the interval at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.45, Book Review. 7.0, Medical Talk. 7.20, Concert: Arab Melody (Glazunov); Allegro (Galuppi); Mazurka (Chopin); My Rose (Fillis); Gipsy Romance (Baldí); Two Airs from Moineau (Beydts); La chère Maison (Baleroze); La Mère Jeanne (Lupont). 7.50, Commercial Prices and News. 8.0, Reading. 8.30, News and Weather. 8.40, Fashion Review. 8.45, Symphony Concert, conducted by Eugene Bigot: Overture, The Bartered Bride (Smetana); Pianoforte Concert in F Minor (Chopin); Scherzo (Lalo); Pieces for Cello and Orchestra: (a) Elegy (Fauré), (b) Spanish Serenade (Glazunov), (c) Allegro appassionato (Saint-Saëns); Symphony No. 7 (Schubert). In the interval at 9.15, Press Review and News.

**PITTSBURGH**

**KDKA, 980 kc/s, 306 metres; 50 kW.** Relay by **W2XK** on 48.86 metres and 25.27 metres.—7.30 p.m., KDKA Home Forum. 8.0, Programme to be announced. 8.15 to 9.30, New York Relay. 8.15, Utility Hall. 8.30, Dixie Days. 9.0, Betty and Bob. 9.15, Southern Symphonies. 9.30, Frances Ingram. 9.45, News and Markets. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News, Piano Classique. 11.15, Sports, Pat Haley. 11.30, Pitt-Jurgh Spotlights. 11.45 to 3.30 a.m., New York Relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15 a.m. (Thursday), Gems of Melody. 12.30, Richard Himber's Orchestra. 1.0, Crime Clues. 1.30, Potash and Perlmutter. 1.45, Red Davis. 2.0, Warden Lawes. 2.30, John McCormack and Orchestra. 3.0, Ortiz Tirado. 3.30, Around the Cracker Barrel.

**PORSGRUND.—See Oslo.**

**PRAGUE**

**614 kc/s, 488.6 metres; 120 kW.—3.0 p.m.,** See **Moravská-Ostrava**. 3.50, Mariotte Play. 4.35, Gramophone Music. 4.45, Talk. 4.55, Gramophone Music. 5.5, Agricultural Report. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Talk for Workers. 6.0, Time and News. 6.10, French Lesson. 6.25, Popular Songs. 6.50, Talk on the following Transmission. 7.5, Suk Symphony Concert for the Composer's Sixtieth Birthday, relayed from the Smetana Hall by the Czech Philharmonic Orchestra, conducted by Jirak. Sokol March, Symphony No. 1 in E. Op. 14; Fantastic Scherzo, Op. 25; Praga-Symphonic Poem G. Op. 26, Praguin. In the interval, Talk. 9.0, Time and News. 9.15, News in French. 9.30 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**SOTTENS, 743 kc/s, 403 metres, 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne),** Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Geneva), Gramophone Music. 12 Noon (from Geneva), Financial News. 12.10 p.m. (from Geneva), Gramophone Music. 1.0 to 2.28, Interval. 2.28, Time Signal from Neuchâtel Observatory. 3.0, Programme from **Schweizerischer Landessender**. 5.0 (from Lausanne), Programme for Children. 6.0 (from Geneva), Science Talk: Modern Photography. 6.20, Photographic Notes. 7.0 (from Geneva), Georges Dandelot Concert Trio: Three Waltzes for Two Pianofortes: (a) Romantic Waltz, (b) Fantastic Waltz, (c) Rocoero Waltz. 7.25, Light Music by the Radio Suisse Romande Orchestra, conducted by Robert Echenard. 8.30 (from Geneva), Gramophone Concert. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

**REYKJAVIK**

**250 kc/s, 1,200 metres; 21 kW.—11.0 a.m.,** Weather Forecast. 1.15 p.m., Variety Programme. 4.0, Weather Forecast. 8.10, Weather Forecast. 8.20, Music and Announcements. 9.0, Light Music. 10.0, Time and News. 10.30, Violin Solo by Thorarinn Gudmundsson, with Arias on Gramophone Records.

**RJUKAN.—See Oslo.**

**ROME**

**Call 1RO, 680 kc/s, 441 metres; 50 kW.** Relay by **Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres, from 8.0 p.m. (approx.); and 2RO, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—12 Noon to 1.0 p.m.,** Concert of Light Music by the Station Orchestra. In the interval from 12.30 to 12.45, Giornale Radio and Exchange. 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio, Exchange, and Report of the Royal Geographical Society. 4.10, Weather. 4.15 to 5.0, Concert of Light Music by the Station Orchestra. 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopolavoro Announcements and Tourist Talk. 5.57, Report of the International Institute of Agriculture (in Italian and English). 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time, Announcements, and Gramophone Records. 7.15, Medical Talk. 7.30, Giornale Radio and Sports Notes. 8.0, The Girl of the Golden West—Opera in Three Acts (Puccini), relayed from the Argentine Theatre. In the intervals, Talk and Announcements. After the Opera, Giornale Radio.

**SALZBURG.—See Vienna.**

**SCHENECTADY**

**WGY, 790 kc/s, 379.5 metres; 50 kW.** Relay by **W2XAF** on 31.48 metres and by **W2XAD** on 19.56 metres.—7.30 p.m., Two Seats in the Balcony, from New York. 8.0 to 8.15, Grande Trio, from New York. 12.45 a.m. (Thursday), Stock Reports. 1.0 to 2.30, New York Relay. 1.0, Popular Programme. 1.30, Popular Programme. 2.0, Musical Programme. 2.30, Variety Programme. 3.0, Popular Programme, from New York. 3.30, Ship of Joy, from New York, followed by Programme Resumé.

**SCHWEIZERISCHER LANDESENDER**

**BEROMUNSTER, 653 kc/s, 459 metres; 60 kW; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne),** Gymnastics. 11.0 (from Berne), Chamber Music on Gramophone Records. 11.29, Time from Neuchâtel Observatory. Weather and News. 11.40 (from Berne), Italian Opera Music on Gramophone Records. 12.25 p.m. (from Berne), Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Berne), Gramophone Concert. 3.0 to 5.30, Programme from Berne. 3.0, Programme to be announced. 4.0, Lute, Violin and Song Recital. 4.0, Suite from L'Arlesienne (Bizet), on Gramophone Records. 4.30, Old Music for Violin, Oboe, Clarinet, Horn and Bassoon. 5.0, Programme for Children. 5.30 (from Zürich), Talk on Cosmetics. 6.0 (from Zürich), English Lesson. 7.0 (from Basle), Recital of Music for Two Pianofortes. 7.30 (from Basle), Schubert and Franz Song Recital. 8.5, Weather and News. 8.15 (from Basle), Recital of Violin Sonatas. 9.0 (from Basle), Die Vierte Wand (The Fourth Wall)—Grotesque (Czinner). 9.20 (approx.), Close Down.

**SOTTENS.—See Radio-Suisse Romande.**

**STOCKHOLM**

**689 kc/s, 436 metres; 55 kW.** Relay by **Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—12 Noon to 12.30 p.m.,** Broadcast for Schools. 4.5 (from Göteborg), Provincial Programme. 4.45, The Practical Corner. 5.0, Gramophone Music. 5.55, Talk. 6.15, Weather and News. 6.30, Report on the Disarmament Conference, relayed from Geneva, 395 kc/s (760 metres). 7.0, The Ninth Symphony in D (Mahler), by the Stockholm Symphony Orchestra, conducted by Václav Talich. 8.20, Reading (G. K. Chesterton). 8.45, Weather and News. 9.0, Dance Music, relayed from the Bern Hall. 10.0 (approx.), Close Down.

**STRASBOURG**

**869 kc/s, 345 metres; 11.5 kW.—11.30 a.m.,** Gramophone Music. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Gramophone Concert. Selection from Coppélia (Delibes); Extract from Les sultanes (Ganne); Selection from Véronique (Messager); Two Melodies; Selection from Sylvia (Delibes); Two Waltzes: (a) Estudiantina (Waldteufel), (b) Gold and Silver (Lehar); Wiener Praterleben (Translatour); Tesoro mio (Becucci); Le cygne (Saint-Saëns); Clair de lune from Werther (Massenet); Selection from Miss Decima (Andran). 2.0, Interval. 4.45, Talk: The most popular Electrical Equipment. 5.0, Concert of Light Music by the Station Orchestra, conducted by Roskam. 6.0, Trio Concert, relayed from Lille, 1,130 kc/s, 265 metres. 7.0, Talk: Educational

Centres for Tubercular Patients. 7.15, Talk in German: The Palm Days of the Trade Guilds. 7.30, Time and News. 7.45, Gramophone Records. 8.0, Press Review in German and Lottery Results. 8.30, Music by Alsatian Composers. The Station Orchestra and Soloists, conducted by Maurice de Villars. Suite in D minor (Erb); Two Melodies (Erb); (a) Berceuse, (b) La barque; Menuet galant (Erb); Ronde de nuit (Erb); Cette petite (Gross); D'r Hans (Gross); Scènes foraines dans un village d'Alsace (Félix Klein); Fileuse (Gross); Berceuse (Gross); Pastorale (Schirle); Fileuse (Schirle); A la Source du Mont Sainte-Odile (Schirle); Two Melodies (North); Asiatic Suite (Pohl); Sextet for Strings (Adams). In the interval at 9.30 (approx.), Press Review. 10.30, Orchestral Concert, relayed from the Grand Kléber Tavern: Novelty March (Pollond); Waltz, Les sirènes (Waldteufel); Overture, Zampa (Hérold); Lehar Potpourri (Hrubý); Selection from La fille de Madame Angot (Lecoq); Potpourri Succeses of 1929-1930 (Postal). 11.30 (approx.), Close Down.

**STUTTGART**

**832 kc/s, 360.5 metres; 60 kW.** Relay by **Freiburg, 527 kc/s, 570 metres.—12.15 p.m.,** See **Frankfurt**. 12.25, Time and News. 12.35, Concert of Modern Operetta Music by the Station Orchestra, conducted by Seyfert: Overture, Wiener Fräulein (Lehár); Selection from White Horse Inn (Stolz-Benatzky); Waltz, Lustiges Wien (Meisel); Selection from Wild Violets (Stolz). 1.30, See **Frankfurt**. 2.30 (from Mannheim), German Songs of the Seventeenth and Eighteenth Centuries: Recital by Gustav Knörzer (Bass). 3.0, Concert by the Station Orchestra, conducted by Gustav Görlich: Overture, Hans Sachs (Lortzing); Ballet Music from Rienzi (Wagner); Prædium and Berceuse (Järnefeldt); Prayer and Dance from Olav Trygvang (Grieg); Waltz from Faust (Gounod); Overture, Gri-Gri (Lincke); Funkgeister Potpourri (Noack); Waltz, Gold and Silver (Lehár); Ländliche Suite (Armandola); Overture, Berlin, wie es weint und lacht (Conradi); March, Jagdbouteuer (Schrämml). 5.0, German for Germans. 5.20, See **Langenberg**. 5.35, Schmitz-Berthel talks about his friend Ludwig Thoma. 5.50, Time and Announcements. 6.0, Transmission for all German Stations, relayed from **Hamburg**. 7.0 to 9.0, See **Frankfurt**. 9.0, See **Munich**. 9.20, Talk: Things you should know. 9.30, See **Frankfurt**. 9.45, News. 10.0, See **Frankfurt**. 11.0, Serenade. 12 Midnight (approx.), Close Down.

**SUNDSVALL.—See Stockholm.**

**TOULOUSE**

**779 kc/s, 385 metres; 8 kW.—6.0 p.m.,** News. 6.15, Accordion Solos. 6.30, Songs from Sound Films. 6.45, Orchestral Music: Selection from Le petit duc (Lecoq), and La fille de Madame Angot (Lecoq). 6.50, Talk. 7.0, Spanish Songs. 7.15, News. 7.30, Scènes alsaciennes—Orchestral Suite (Massenet). 7.45, Popular Songs. 8.0, Military Music. 8.15, Opera and Opéra-Comique Music: Priantemps qui commence, from Samson et Delilah (Saint-Saëns); Duet from Aida (Verdi); Chorus from 'Avaleria rustiana (Mascagni); Je suis Escamillo, from Carmen (Bizet); Elle ne croyait pas, from Mignon (Thomas); O messenger des Dieux, from Thais (Massenet); Paresseuse fille, from Faust (Gounod). 8.45, Music by a Viennese Orchestra. 9.0, Concert by La Sirène Toulousaine, conducted by Ichac. In the interval, Airs from Operettas. 10.15, North African News. 10.30, Concert for Listeners in Morocco. 11.0, Request Music. 11.15, Dance Music. 12 Midnight, News. 12.5 a.m. (Thursday), Argentine Music. 12.15 Spanish Songs. 12.30 (approx.), Close Down.

**TRIESTE**

**1,211 kc/s, 247.7 metres; 10 kW.—4.15 p.m.** till Close Down, See **Turin**.

**TRONDHEIM.—See Oslo.**

**TURIN**

**1,096 kc/s, 273.7 metres; 7 kW.** Relay by **Milan, 905 kc/s, 331.5 metres; Genova, 959 kc/s; 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.15 p.m.,** Song Recital by Eleonore Visciola (Soprano) and Nicolai (Mezzo-Soprano). 5.0 to 5.5, Weather. 5.45, Giornale Radio, Dopolavoro Announcements, and Gramophone Music. 6.0, Time, Tourist Talk, and Gramophone Music. 6.10, Agricultural Notes, and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio, and Weather. 7.15, Medical Talk. 7.30, A Comedy in Three Acts. After the Comedy, Dance Music. 10.0, Giornale Radio.

**VATICAN CITY**

**15,120 kc/s, 19.84 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.**

—11.0 to 11.15 a.m., Religious Information in Spanish. 8.0 to 8.15 p.m., Religious Information in Italian.

**VIENNA**

**581 kc/s, 517 metres; 100 kW.** Relay by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer. Soloist: Adolf Müller (Flute): March, Furchlos un treu (Fueck); Overture, Das Modell (Suppé); Flute Solo: Liebeslied (Titl); Zigeunerfest (Lehár); Volksliedchen (Kozak); Märchen (Kozak); Waltz, The Blue Danube (Joh. Strauss); Von Pontius zu Pilatus (Morena); Geh', Alte, schau (Schubert-Berte); Spanish Flute (Hellsbergner); Zauberei (Meyer-Helmund); Geh' ma mit (Sieczynski); Potpourri, Tango un Mitternacht (Komjati); Waltz, Wiener Bürger (Ziehrer). In the interval at 10.55, Weather. 12 Noon, Time and News. 12.10 p.m., Gramophone Concert: In Penseroso (Händel); Impromptu for Pianoforte (Schubert); Spring Song (Gounod); Zapateado (Sarasate); Aria from Ernani (Verdi); Lohengrin's Narrative from Lohengrin (Wagner); Ave Maria from Otello (Verdi); Aria from The Flying Dutchman (Wagner); Waltz from Nalla (Delibes-Dohnányi). 2.0, Time, Weather, Market Prices and Exchange. 2.20, Talk: Spices and their Synthetic Imitations. 2.35, Orchestral Concert on Gramophone Records: Viennese Folk Music (Kozak); Selection from Les Mousquetaires au Couvent (Varney-Tavan); Dance of the Dervishes (Bendix); Musira prohibita (Gastaldon); Liebeselnen (Michaëlis); Potpourri of Children's Songs (Robrecht); Schreibe deine Liebste dir (Benes); Melody (Santugini). 3.15, Recitation. 3.40, Talk: The Kindergarten Teacher and her Work. 4.5, Contemporary Austrian Composers—Alexander Spitzmüller Concert by the Rothschild Quartet. Soloists: Marieanne Mislak-Kapper (Soprano), Hugo Burghauser (Bassoon), and Hans Weber (Pianoforte). Prelude and Double Fugue, Op. 7, for Pianoforte; String Quartet, Op. 8, Three Songs: (a) Taggesang, (b) Jahresart, Op. 10; (c) Flötenspieler vom Nil; Divertimento breve, Op. 6, for Two Violins, Viola, Bassoon and Pianoforte. 4.55, Talk: Sailing Championships. 5.10, Health Talk. 5.35, Talk for Workers. 6.0, Military Band Concert: Mein Österreich (Richter); Festival Overture (Suppé); Meletta-Marsch (Wagner); Vaugoin-Jubiläum-Festmarsch (Kastner); Strauss Operetta Potpourri (Schögl); Dr. Dollfus March (Thann); Waltz, Gebrüchler (Ziehrer); Jugenddeutscher-Marsch (Richter). In the interval at 6.25, Time, Weather and Programme Announcements. 7.15, A Lecture by Raoul Arsan. 7.55, Topical Talk. 8.10, Joseph Marx Song Recital by Hans Dulian (Baritone), with the Composer accompanying; Japanisches Regenlied; Sendung; In meiner Träume Heimat; Selige Nacht; Wie reizend bist du; Dezember; Der Dichter; Abends; Wie einst; Bitte; Gebet; An einen Herbstwald; Regen; Windräder; Der Ton. 8.55, News. 9.10, Report in Esperanto on the International Conference to be held in Vienna and Budapest in 1934. 9.25, Concert Relay: Part I—From the Lehár Hall. Part II—From the Hotel Krantz-Ambassador. After the Programme, News.

**WARSAW**

**212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Dance Music. 11.30, Radio Journal and Weather. 11.35, Dance Music (cont'd.). 12 Noon, Interval. 2.30 p.m., Economic Notes. 2.40, Rachmaninov and Liadov Music on Gramophone Records. 3.10, Talk for Children: The Flight of the Migratory Birds to Africa. 3.25, Talk: Children's Letters. 3.40, Talk on the Polish Language. 3.55, Song and 'Cello Recital by Mme. Zwiedryn (Soprano) and Dancowski, relayed from **Lwow, 788 kc/s, 381 metres.** 4.50, Agricultural Correspondence. 5.0, Educational Talk. 5.20, Orchestral Concert: Mazurka (Kaczynski); Melody (Wigiewski); Oberkis and Polka (Stromberg); Waltz (Kaczynski); Polka Mazurka (Slaski); Mazurka (Piorkowski); Two Dances (Stromberg); Polka (Kaczynski); Waltz and Dance (Stromberg); Potpourri of Polish Dances (Kaczynski); Melody (Piorkowski); Polka (Slaski). 6.5, Miscellaneous Items. 6.25, Talk: Readings in the Winter Programme. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Concert by a Guitar Orchestra with Wysocki (Songs). 8.0, Talk: Commercial Life in Poland. 8.15, Pianoforte Recital by Sztompka: Variations in F minor (Haydn); Sonata Appassionata (Beethoven); Nocturne and Cracovienne fantastique (Paderewsky); Ma chérie (Chopin-Liszt); Spinning Song from The Flying Dutchman (Wagner). 9.0, Sports Notes. 9.10, Dance Music from the Adria café. 10.0, Weather and Police Notes. 10.5, Dance Music (cont'd.).

**ZAGREB**

**977 kc/s, 307 metres; 0.75 kW.—6.10 p.m.,** Talk: The Esperanto Language. 6.30, Announcements. 7.0, Concert relayed from **Ljubljana**. 9.0, News. 9.15, Dance Music. 10.0 (approx.), Close Down.

**ZÜRICH.—See Schweizerischer Landessender.**

## ALGIERS

824 kc/s, 364 metres; 13 kW.—7.20 p.m., Songs from Operettas. 7.55, News. 8.0, Time and Lottery Results. 8.10, Widow Duress—One Act Comedy (Bisson and Mars). 8.45, News. 8.50, Talk. 9.5, Request Gramophone Records. 9.30, News. 9.35, Request Gramophone Records. 9.55, News. 10.0, Eastern Music.

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Report and Gramophone Concert. 6.0, Programme for Children. 6.40, News. 7.0, French Lesson. 7.15, Recitation of Poems. 7.30, Time. 7.31, Violin Duets. 8.0, Song Recital by P. J. O'Toole (Tenor). 8.15, The Station Orchestra. 8.45, Pianoforte Recital by Dina Copeman. 9.5, Soprano Solos by Alice Rafter. 9.20, The Station String Orchestra. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Variety Concert: Spanish Sweetheart (Evans); Jealousy (Gade); Flor de Cuba (Conyer); Zigeuner, you have stolen my heart (Egen). 9.45, Programme of Dance Music: I cover the Waterfront (Heymann); Hold me (Schuster); Let's call it a Day (Brown); You're mine you (Green). 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd.: The Wedding of the Rose (Jessel); Spanish Gypsy Dance (Chaput); Pianoforte Solo: Wasps (Holbrook); Racing Commentary; Frühlingsstimmen (Joh. Strauss); Harlequinade (Squire); Xylophone Solo: Dance of the Marionettes (Gaston); Selection from The Desert Song (Romberg). 10.30, I.B.C. Goodnight Melody, followed by News and Weather. 10.40, Irish Dance Band Music. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Concert by the Station Trio: Selection from Los Claveles (Serrano); Serenade la bella Italia (Busquets); Polo gitano (Brete); Nocturne, El caballero sin nombre (Granados); Rejas y flores (Vila); Selmann Potpourri (Fusté); Selection from La Villana (Vives). 7.0, Request Gramophone Music. 7.30, Exchange and Gramophone Music (cont'd.). 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral. Weather, Exchange, and Market Prices. 9.5, Concert by the Station Orchestra: March (Lincke); Waltz (Siede); Reverie du soir (Saint-Saëns); Minuet (Ribo); Saturnales (Massenet); Overture, The Mastersingers (Wagner). 10.0, L'angel de la guarda—Catalan Play in Three Acts (Solier). In the interval at 11.0, News. 12 Midnight (approx.), Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—12.10 p.m., Concert from Turin. 1.0, See Rome. 3.30, Programme for Women. 3.50 to 5.0, See Rome. 5.35, News in Albanian. 5.45 (approx.) to 6.20, See Rome. 6.20, News in Albanian. 6.40 till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—6.0 p.m., Gramophone Music. 6.20, A Dress. 7.0, Instrumental Concert: Quartet for Pianoforte, Violin, Viola and Cello (Leken); Septet (Saint-Saëns). 7.30, Gounod Concert for the Fortieth Anniversary of his Death. 9.0, Time and News. 9.10 (approx.), Gypsy Music from the Dva Jelena Restaurant. 9.45, Gramophone Dance Music.

## BERLIN

DEUTSCHLANDSENDER, REICHSENDER, 183.5 kc/s, 1,635 metres; 60 kW.—1.0 p.m., Gramophone Concert: Brandenburg Concerto No. 3 in D (Bach); Fugue in G minor (Bach); Arioso (Händel); Les petits riens (Mozart); Second and Third Movement from Symphony No. 3 in D (Schubert); Scherzo in D (Brahms); Minuet in A (Brahms); Aria from Der Freischütz (Weber); Mondnacht (Schumann). 1.45, Programme for Children. 2.0, Programme for Young People. 2.30, Weather and Exchange. 2.45, Reading from Das Kaiserbuch (Paul Ernst). 3.0, Concert from Heilsberg. 4.0, Talk for Women. 4.20, Martin Grabert and Alexander Preuss conducted by the Station Chamber Choir, conducted by Hans Georg Görner. Soloists: Carola Farn-Gérard (Soprano) and Walter Prätorius (Tenor). 5.0, A Poem. 5.5, Variety Programme. 5.30, Talk. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Today's Motto. 7.10 (approx.), Programme from Breslau. In the interval at 8.20, Talk on Ferdinand Bonn. 9.0, Weather and News. 9.45, Weather. 10.0, Programme from Berlin (Funkstunde). 11.30 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—3.30 p.m., Haydn and Mozart Concert: Symphonie concertante for Violin, Cello, Oboe, Bassoon and Orchestra (Haydn); Divertimento for Six Wind Instruments and Two Violins (Haydn); Symphony in G Minor (Mozart). 4.30, Anecdotes about King Friedrich Wilhelm I. 4.50, Travelogue: Through Southern Arabia. 5.10, Song Recital by Benjamine Gigli on Gramophone Records: Arias from (a) Manon (Massenet), (b) The Pearl Fishers (Bizet), (c) Manon

Lescant (Puccini), and (d) Tosca (Puccini); Povero Pulcinella (Buzzi-Percia); Funiculi-Funicula (Denza). 5.30, The Funkstunde informs its Listeners. . . . 5.35, Talk on Pomerania. 5.45, Topical Talk. 6.0, Transmission for all German Stations: National Artisans Festival Programme—Scenes and Songs of the Medieval Guilds, arranged by Rolf Reissmann. 7.5, On Board the Training Ship Gorch Fock—a Radio Report. 8.0 to 12 Midnight, Variety Programme. In the interval at 9.0 (approx.), News, and at 10.0 (approx.), Report by Herbert Seehofer. 12 Midnight, Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.40, Talk arranged by the International Labour Bureau. 7.55, Lottery Results. 8.0, Talk on Wine. 8.15, News. 8.30, Le Plancher des Vaches—Comedy in Three Acts (Jean Sarment).

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW. 5.25 p.m., Schrammel Music. 5.55, Talk for Housewives. 6.0, See Prague. 7.10, Talk: The Relations between Czechoslovakia and Yugoslavia in the Past. 7.25, Programme to be announced. 9.0, See Prague. 9.45 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—11.0 a.m., Weather. 11.5, Concert by the Silesian Philharmonic Orchestra, conducted by Rischka: Overture Semiramis (Rossini); Spring Suite (Nevin); Selection from Undine (Lortzing); Serenade Op. 7 (B. Strauss); Waltz, Seid umschlungen, Millionen (Joh. Strauss); March; Selection from Der Tenor der Herzogin (Künneke); Shawl-Polka (Joh. Strauss); Suite, German Baroque (Pachernegg); Overture, Frau Luna (Lincke). 12.45, Time and News. 1.10, Soprano Song Recital by Charlotte Ziegler: Songs (Brahms): (a) Juchhe, (b) Sonntag, (c) Jungfräulein, soll ich mit Euch gehn, (d) Feinsliebchen du sollst, (e) Dort in den Weiden steht ein Haus; Rosenlieder (Eulenburg): (a) Monatsrose, (b) Wilde Rose, (c) Rankende Rose, (d) Seerose, (e) Weiss und rote Rose. 1.35, Operetta Music on Gramophone Records: Selection from Die Fledermaus (Joh. Strauss); Two Airs from Musik und Liebe (Müller): (a) Mir hat ein Märchen heut geträumt, (b) Nun ist Frieden uns beschieden; Selection from The Land of Smiles (Lehar). 2.0, Agricultural Prices. 2.15, Book Review. 2.35, Talk: Hiking in Silesia. 2.45, Programme for Children. 3.15, Orchestral Concert, conducted by Topitz: Overture, Berlin, wie es weint und lacht (Conrad); Slav Rhapsody No. 2 (Friedemann); Komm zu mir (Gangherger); Delirium-Walzer (Jos. Strauss); Polka Die Nachtigall (Popp); Flotte Postillon (Rathke); Potpourri, Was wir lieben (Gangherger); Ständchen (Jos. Strauss); Neue Pizzicati-Polka (Joh. Strauss); Waltz, Verschmähte Liebe (Lluke); Savoyarda (Friedl-Lienz); Overture, Fatinitza (Suppé). 4.55, Agricultural Prices. 5.0, Topical Report. 5.25, Talks by Workers and their Leaders. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, News. 7.10, Così fan tutte—Opera in Two Acts (Mozart), relayed from the Municipal Theatre. In the interval at 8.20, Commentary on the Opera. 9.40, Time and News. 10.5, Programme from Berlin (Funkstunde). 12 Midnight, Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Janota: Overture, Il Guarany (Gomez); Romantic Suite (Bullerian); Andalusian Romance, Op. 22, No. 3 (Sarasate); Spanish Dance No. 8, Op. 26 (Sarasate); Rhapsody in A minor (Dvorak). 3.50, See Prague. 4.15, Programme for Young People. 4.25, Gramophone Music. 4.35, See Prague. 4.50, Gramophone Music. 5.0, Theatre and Film Review. 5.15, See Prague. 5.25, German Transmission: News, Geological Talk and Talk for the Housewife. 6.0, See Prague. 7.10, See Bratislava. 7.25, Programme to be announced. 8.25, Concert by the Station Orchestra. 9.0, See Prague. 9.45 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans. Overture, Si j'étais roi (Adam); Printemps d'amour (Kalkman); Ballet Music from Les deux

digeons (Messenger); Pianoforte Solos (Chopin): (a) Prelude, (b) Mazurka, (c) Waltz; Selection from Hérodiade (Massenet); Chanson de Josseline (Desprez); Waltz, Just another dream of you (Davis and Burke); Glow-Worm Idyll (Lincke). 1.0 p.m., Le Journal Parlé. 1.10, Gramophone Concert. 5.0, Concert by the Radio Orchestra, conducted by André. Foxtrot, China-town (Gerbes); Menuet printanier (Desprez); Selection from Fatinitza (Suppé); Waltz (Fryberg); Selection from Hansel and Gretel (Humperdinck); Foxtrot (Rixner); Selection from Oh, Kay (Gershwin); Little Suite for Orchestra, No. 2 (Zilka). 5.30, Music Talk. 6.0, Talk for Housewives. 6.15, Gramophone Music. 7.15, Talk for Workers. 7.30, Sports Notes. 8.0, Cabaret Programme. 8.30, Gramophone Music. 8.45, Talk: on Co-operation. 9.0, Concert by the Station Orchestra, conducted by André: Hungarian March (Berlioz); Slav Dances (Bach); Russian Dances (Bullerian); Spanish Dances (Falla); Cello Solo: Harlequin (Popper); Popular Dances from The Bartered Bride (Smetana); Fantasia, Tempo tempo (Dostal). 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—12 Noon, Gramophone Concert: Valse des fleurs (Tchaikovsky); Overture, Light Cavalry (Suppé); Ständchen (Schubert); Ave Maria (Schubert); Danse macabre (Saint-Saëns); Entry of the Gladiators (Blankenburg). 12.45 p.m., Organ Recital, relayed from the Théâtre Royal, Antwerp: Selection from Tannhäuser (Wagner); French Opera Potpourri; Flemish Fantasia; Toccata (Widor); Dances (D'Hooghe) Kálmán and Stolz Operetta Potpourri; Hungarian Rhapsody (Liszt). In the interval at 1.0, Le Journal Parlé. 1.30, Concert by the Small Station Orchestra, conducted by Leemans: March, King Cotton (Sousa); Roses from the South (Strauss); Waltz, Très jolie (Waldteufel); Selection from Il Trovatore (Verdi); Melody (Heymann). 5.0, Gramophone Concert. 5.45, Programme for Children. 6.30, Gramophone Concert: Overture, Poet and Peasant (Suppé); Selection from White Horse Inn (Stolz-Benatzky); Selection from Her Highness Commands (Stolz); Selection from Victoria and her Hussar (Abraham); Melodies from The Love Parade (Scherzinger). 7.10, News. 7.15, Talk. 7.30, Talk for Women. 8.0, Concert by the Radio Orchestra, conducted by André; Soloist, Van Schoor (Songs): K.V.R.O. Song; Spanish Caprice (Rimsky-Korsakov); Songs: Extracts from L'Arlesienne (Bizet). 8.45, Talk: A Journey down the Scheldt. 9.0, Gramophone Concert: Selection from The Merry Peasant (Fall); Hindu Song (Rimsky-Korsakov); Intermezzo from Cavalleria rusticana (Mascagni); Der Erkönig (Schubert); Wembley Military Tattoo; In a Chinese Temple Garden (Kctelbey); When the Guards are on Parade (Lorn). 9.55, Evening Prayer. 10.0, Le Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Dinico Orchestra. In the interval at 5.0, Radio Journal. 6.0, Educational Programme. 6.20, Light Music on Gramophone Records. 6.40, Educational Programme. 7.0, Song Recital by Mme. Metaxa. 7.20, Pianoforte Concerto in E Flat (Liszt) by the Station Orchestra, conducted by Georgesco. Soloist, Mlle. Madeleine Coeresco. 8.0, Talk. 8.15, Music by the Station Orchestra. 8.45, Radio Journal.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 840 metres from 6.15 (approx.) till Close Down.—4.30 p.m., Concert by the Opera House Orchestra, conducted by Fridl. 5.45, English Lesson. 6.15, Talk with Gramophone Illustrations: The Harlem. 6.55, Programme to be announced. 7.30, Pianoforte and Cello Sonata Recital by Andreas Petri and Ludwig Frank; Sonata in F. Op. 69 (Beethoven); Sonata No. 1 in A minor (Schubert). 8.10, News. 8.30, Concert by the Paul Pertis Gypsy Band from the Hotel Britannia. 9.15, Political Review. 9.30, Weather. 9.35, Song Recital by David Ney: Spring Song from The Valkyrie (Wagner); Lohengrin's Farewell (Wagner); Aria from The Twilight of the Gods (Wagner); Aria from Anna Karenina (Lubay); Song (Lavot); Song (Sandor); Rakoczi Bekehrung (Kaesoh). 10.15, Dance Music from the Hotel St. Gellert.

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall. 11.2, Concert by the Harald Andersen String Ensemble, relayed from the Hotel

d'Angleterre. 1.0 p.m., Interval. 1.45, Jazz Music. In an interval at 2.30 (approx.), Reading (Jesper Ewald). 3.45, Programme for Boys. 4.30, Exchange and Fish Market Prices. 4.45, Talk. 5.15, Elementary English Lesson. 5.45, Weather. 6.0, News. 6.15, Time Signal. 6.16, Talk: Democracy and the Dictator. 6.45, Danish Lesson. 7.10, Concert by the Radio Symphony Orchestra, conducted by Nikolai Malko, relayed from the State Broadcasting Building. Soloists: Paul Hindemith (Viola) and Tenna Frederiksen Kraft (Songs); Symphony with Viola Obbligato, Harold en Italie (Berlioz); Viola Concerto, Op. 36, No. 4 (Hindemith); Songs: (a) Aria (Cesti), (b) Aria Alessandro nell'Indie (Vinci), (c) Aria from La serva padrona (Pergolesi); Overture, The Thieving Magpie (Rossini). 9.15, News. 9.30, Reading. 9.50, Dance Music by the Teddy Petersen Band, relayed from the Wivex Restaurant. In an interval at 11.0, Time Signal and Chimes from the Town Hall. 11.30 (approx.), Close Down.

GORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—10.30 to 11.30 a.m., Programme in English by the I.B.C. Happy Hour: Part I: Concert of Scottish Music: Signature Tune, Selection from The Thistle (arr. Myddleton); Green Grow the Rushes O (Traditional); Wee Macgregor Patrol (Amers); Annie Laurie (Scott); The Glasgow Highlanders (arr. Diack); Heather Bloom (Kirby); Comin' through the Rye (arr. Smart); Selection of Scottish Airs. Part II: Dance Music: Tiek, Tock; From me to you; Julien; Isn't it Heavenly?; I live for Love; A Woman should stick to her Man; Down the Old Ox Road; Signature Tune. 11.30, Programme in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Concert for Working and Littlehampton—I.B.C. Members' Request Hour. Signature Tune, The Night by the Sea; The Whistler and his Dog (Pryor); There's a Cabin in the Pines (Hill); Comin' through the Rye (arr. Smart); Air for the G String (Bach); Sleepy Time Down South; Hawaiian Twilight (Traditional); When the Wild, Wild, Roses bloom (Brown); My Ain Folk (Lemon). 5.30, Orchestral Concert for Brighton and Hove: Russian Rhapsody (Nussbaum); The Clock and the Dresden Figures (Kctelbey); The Match Parade (Wehle); The Wayside Shrine (Sherwood); My Mother's Garden (Hanley); Sweetheart, I'm dreaming of you (Desmond); Love Everlasting (Friml); Vienna, City of my Dreams (arr. Reeve); Signature Tune. 6.0, Programme in French. 10.0 (approx.) till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune, The Bells of Normandy; Let's call it a Day; Oh! Johanna; Reflections in the Water; Avalon; It's Sunday down in Caroline; At the Old Pig and Whistle; Lover; Down the Old Ox Road; Isn't it Heavenly?; Learn to croon; Shuffle off to Buffalo; Down in the Valley; Old Man Harlem; I wake up smiling; Won't you stray to Tea?; P.C. 123—The Policeman's Song. 11.0, Talkie Time. Signature Tune, Sittin' in the Dark; Monte Carlo Medley; Sweetheart Darlin'; Sergeant Flagg and Sergeant Quirt; A nous la liberté; Selection from Il est charmant; Whoopie Medley; Let the World go drifting by; Love Songs of the Nile; Signature Tune. 11.30, Concert by the International Broadcasting Company (Ireland), Ltd.: Signature Tune, Come back to Erin; Down the Waves (Rosas); In a Country Lane (Coates); The Mountains of Mourne (French); My Lady Dainty (Hesse); By the Waters of Killarney (Aitken); The Birth of the Blues (Henderson); Oh, could I but express in Song; The Busy Bee (Bondix); Signature Tune, Come back to Erin. 12.5 a.m. (Friday), Late News Bulletin in English. 12.10 (approx.), Club Concert for Deal and Walmer Listeners. Signature Tune, The Chum Song; Rocky Road (Gibbs); As long as you're there (Monaco); Alabama Song (Well); Just a Little closer (Meyer); Mama Inez (Grenet); Sweet Dreams Pretty Lady (Downey); Carry me back to Green, Green Pastures (Pepper); My Lucky Day (Parr-Davies); Lazybones (Mercer); Wedding of the Dragonflies (Myers) I'll show you off (Hammerstein); Sweetheart Darlin' (Kahn); Happy Ending (Parr-Davies); I'm getting Sentimental over you (Boltmann). 1.0, Dance Music: Signature Tune, Bells of Normandy; It was a Night in June; Spanish Eyes; What a Lady Josephine must have been; Stay out of my Dreams; Sweep; Sunlow in a Little Green Hollow; A Girl like Nina; Under a Blanket of Blue; My Wishing Song; You did everything for me; Stormy Weather; I shall still keep smiling along; Have you had a Good Day To-Day?; Someone stole Gabriel's Horn; Adorable; They all do the Rumba; I raised my Hat. 2.0, I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

## FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35, See Stuttgart. 1.30, Interval. 2.30, Weather Forecast. 2.40, Time and Market Prices. 3.0, Concert by the Station Orchestra, conducted

OCT. 19th **THURSDAY** continued

by Hans Rosbaud. Soloists: Luise Gmeiner (Pianoforte) and Helma Bohrmann (Soprano); Overture, Julius Caesar (Schumann); Pianoforte Concerto, Op. 54, in A minor (Schumann); Overture, Francesca da Rimini (Goetz); Overture, Die Landsknechte (Zieher); Waltz from Die Chansonette (Dellinger); Gallop, Klipp-Klapp from Der Waldmeister (Joh. Strauss); Operetta Songs; Waltz, Traumland (Fueki); Polka, Yes and No. (Gené); Overture, Der Göttergatte (Lehár); Operetta Songs; Laterne-Walzer (Lincke); March, Der Tausendkünstler (Blankenburg). 5.0 to 5.50, See Stuttgart. 5.50, Weather and News. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Topical Talk. 7.10, See Langenberg. 9.0, News. 9.20, See Stuttgart. 9.30, Time and News. 9.45 to 11.0, See Stuttgart. 11.0, Serenade. 12 Midnight, Close Down.

**FREDRIKSTAD.**—See Oslo.  
**FREIBURG.**—See Stuttgart.  
**GENEVA.**—See Radio-Suisse Romande.  
**GENOA.**—See Turin.  
**GLEIWITZ.**—See Breslau.  
**GÖTEBORG.**—See Stockholm.  
**GRAZ.**—See Vienna.  
**HAMAR.**—See Oslo.

**HAMBURG**  
806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres, and Kiel, 1,292 kc/s, 232.2 metres. 6.0 p.m., Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0 (from Hanover), From a Brunswick Music Publisher. Part I—A Radio Report. Part II—Chamber Music. Movement from the Pianoforte Trio No. 2, Op. 100 (Gurlitt); Divertissement No. 3, Op. 68, for Solo Flute (Kuhlau); Movement from the Scarlatti for Pianoforte Solo (Niemann); Baritone Solo: Beherzigung from the Goethe Lieder (Sommer); Movement from the Partita in B minor for Flute and Pianoforte (Therstappen); Baritone and Pianoforte Trio: Theodor Storm Music (Graener). 8.0 (from Hanover), Brunswick Skilled Trades. 9.0, Time, Weather and News. 9.20, Light Music by a Nazi Band, relayed from the Ostermann Restaurant. 10.0, Dance Music by the Small Station Orchestra and Three Pianofortes.

**HANOVER.**—See Hamburg.  
**HEILSBURG**  
1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—11.30 a.m., Concert by the Königsberg Opera House Orchestra, conducted by Brückner. In the intervals at 12.1 p.m., Time and Weather, and at 12.20 and 1.0 News. 1.30 (from Danzig), Exchange. 2.0, Agricultural Prices and Exchange. 2.5, Concert by the Small Station Orchestra, conducted by Wileken, Overture, Il Guarany (Gomez); Suite, Greenland (Juel Frederiksen); Ballet Suite from Coppélia (Delibes); Chromatic Waltz (Kockert); Ballet des parfums (Popy); Selection from Flotte Bursche (Plotow); Waltz, Mia bella Napoli (Ohlsen); Suite, In a Fairy Realm (Kettelboy); Overture, The Queen's Kerkchief (Strauss). In the interval at 2.50, Talk: Re-opening of the University Extension Courses. 4.0, Programme for Young People. 4.25, Cello and Pianoforte Recital. 4.50 (from Danzig), Programme in Honour of Gustav Frensen's Seventieth Birthday. 5.15, Agricultural Prices. 5.25 (from Danzig), Agricultural Programme. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, News. 7.10, See Copenhagen. 8.0, German Folk Songs (Brahms), by the Station Choir, conducted by Firchow. 8.45, Eulenspiegel Suite of Five Pieces for Pianoforte (Jentsch), played by Erich Borscheid. 9.0, News. 9.20, Elementary English Lesson.

**HILVERSUM**  
1,013 kc/s, 296.1 metres; 7 kW up to 4.40 p.m., and 20 kW (from 5.40 p.m.).—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.). 11.41 a.m., Concert by the Wireless Orchestra, conducted by Nieu Treep. Hands across the Sea (Songs); Scandinavian Suite (Frederiksen); Moonlight on the Bosphorus (Köpping); Glow-Worm Idyll (Siede); Ange d'amour (Waldteufel); Gramophone Records; Grenadiers' March (Schubert-Berté); The Rose Beetle goes awing (Armandola); In the Mystic Land of Egypt (Kettelboy); On the Quarter Deck (Alford); Gramophone Records; Musical Comedy Revue (Petras); Waltz (Ganne); Hearts and Flowers (Zibulka); Festival Overture (Leutner); Overture, Eine Nacht in Venedig (Joh. Strauss); The Marriage of the Winds (Hall); Narzissenmädchen (Siede); La mousmée (Ganne); Old Contrades (Teike). 2.40, Dress-making Lesson. 3.25, Gramophone Music. 3.40, Programme for Hospitals. 4.10, Dance Music by Bela Kiss and his Band, relayed from the Carlton Hotel, Amsterdam. 4.40, Programme for Children. 5.10, Concert of Light Music by Hans Schindler and his Orchestra. In an interval at 6.10, Sports Talk. 7.10, English Lesson. 7.40, Time and News. 7.45, Gramophone Music. 7.55, Concert by the Concertgebouw Orchestra, conducted by Pierre Monteux, relayed from the Concertgebouw Amsterdam. 8.55, Gramo-

phone Music. 9.10, Inquest—Radio Play (Michael Barringer). 9.45, Concert of Light Music by Hans Schindler and his Orchestra. 10.40, News. 10.50, Gramophone Music. 11.40 (approx.), Close Down.  
**HORBY.**—See Stockholm.

**HUIZEN**  
150 kc/s, 1,875 metres; 7 kW until 3.40 p.m. Transmitted from Kootwijk, on 50 kW, from 3.40 p.m.—11.55 a.m. to 1.20 p.m., Programme of the Catholic Radio Society (K.R.O.). 11.55, Concert by the K.R.O. Orchestra, conducted by van 't Woud. Gipsy March (Laocoe); Ballet (egyptien (Luigini); Minuet (Bocherini); Selection from Der Rastelbinder (Lehar); Selection from Tom Jones (German); Gramophone Music. Overture, Indra (Plotow); Rudolfsklänge (Strauss); Turkish Suite, No. 2 (Gawwin); Wedding Day on Troldhaugen (Grieg); Küssen ist kein Sünd (Eysler); Folies Bergères (Lincke). 1.40 till Close Down. Programme of the Christian Radio Society (N.C.R.V.). 1.40, Talk: Spare-Time Hobbies—Handwork. 2.40, Gramophone Music. 3.10 to 3.40, Interval. 3.40, Bible Reading and Sacred Music. 4.40, Handwork Lesson for Children. 5.10, Violin and Pianoforte Recital, by Mlle. Langeveld (Violin), Mlle. Stoker (Violin), and Van Erven Dorbus (Pianoforte). Sonata in G Minor, Op. 2, No. 8 (Handel); Largo ma non tanto (Bach); Gramophone Music; Sonata, Op. 8, No. 4 (Haydn); Suite (Moskowsky); Allegretto (Sinding); Berceuse (Godard); Serenade (Godard). 6.10, Talk. 6.25, Gramophone Music. 6.40, Police Notes. 6.55, Religious News. 7.10, Press Review. 7.40, Choral Concert, conducted by de Rook. Gramophone Music in the inter-

11.0, See Frankfurt. 12 Midnight, Close Down.  
**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**  
769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—Transmits at intervals from 11.0 a.m., Concert by the Station Orchestra, conducted by Hilmar Weber; Soloist: Fritz Lorenz (Bassoon); Suite from The Taming of the Shrew (Zieher); Theme and Variations, and Rondo for Bassoon (Lorenz); Slav Dances, Nos. 5 to 8 (Ivorák); Selection from Die Königskinder (Humperdinck); Waltz in A Flat (Chopin-Weber). 12.15 p.m., News and Programme Announcements. 12.30, Gramophone Concert: German Workers' Anthem (Finger); Two Arias from Aida (Verdi); Violin Solo: Melody (Tosti); Love Duet from Madame Butterfly Puccini); Pianoforte Solo: Rhapsody in B Minor (Brahms); Song: The Vagabond (Garnio); Overture, Anaerion (Cherubini). 1.15, News. 1.40, Film Review. 2.0, Discussion: Wonders of Modern Physics. 2.35, Economic Notes. 3.0, Concert by the Leipzig Symphony Orchestra, conducted by Blumer; Soloists: Erich Kindseher (Violin) and Theodor Blumer (Pianoforte); A German Overture (Beck); Selection from Andrea Chenier (Giordano); Two Pieces for Violin and Pianoforte (Paganini); (a) La Campanella, (b) Caprice No. 20; Two Movements from the Suite, Op. 4 (Zieher); Concert Waltz (Glazunov); Two Pieces (Ries); Introduction and Tarantella for Pianoforte and Violin (Sarasate); Selection from Die Fledermans (Strauss). 4.30, Reading (Fou-



Hamburg's choral singing is one of the distinguishing features of this well-known station. The photograph shows the station's permanent choir presided over by Herr Gerhard Gregor.

vals. 8.40, Talk. 9.10, Organ Recital by Stretomini. In the interval at 9.40, News. 10.10, Gramophone Music. 11.10 (approx.), Close Down.  
**INNSBRUCK.**—See Vienna.  
**KALUNDBORG.**—See Copenhagen.  
**KIEL.**—See Hamburg.  
**KLAGENFURT.**—See Vienna.  
**KOSICE.**—See Prague.

**LANGENBERG**  
635 kc/s, 473 metres; 60 kW.—11.0 a.m., Programme from Stuttgart. 12.15 p.m., See Frankfurt. 12.25, News and Weather. 12.35, See Stuttgart. 1.30, Talk: Gas as an Economic Source of Power. 1.50, Song Recital by Wanda Aehsel (on Gramophone Records); Senta's Ballad from The Flying Dutchman (Wagner); The Goose Maiden's Prayer from Die Königskinder (Humperdinck); Saffi's Song from The Gipsy Baron (Strauss); Zorika's Song from Gipsy Love (Lehár); Two Songs from Eine Nacht in Venedig (Strauss). 2.10, Talk: Country Sports for Schools. 2.30, Economic Notes. 2.50, Political Announcement. 3.0, See Frankfurt. 5.0 to 5.35, See Stuttgart. 5.35, Talk: Young Students and High School Pupils for Agriculture. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, See Frankfurt. 7.10, Concert by the Station Orchestra, conducted by Buschkötter. Soloists: Lydia Hoffmann-Behrendt and Walter Schmiederhan (Violin). Overture, Lebensfreude (Schumann); Violin Solo: Burlesque in D Minor (Strauss); Mazepa (Liszt); L'apprenti sorcier (Dukas); Violin Concerto in D (Paganini); Oriental Rhapsody (Glazunov); Music after a Violin Etude (Mayseda-Hellmesberger). 9.0, See Frankfurt. 9.20, See Stuttgart. 9.30, News and Weather. 9.45 to 11.0, See Stuttgart.

Caliph of Bagdad (Boieldieu); Les Violons de M. de Conty (Woruzer); Andante for Flute (Mozart); Aria from Figaro (Mozart); La mia Sorellata (Staffeli); Chanson pour un petit cheval (Sévère); Piece on an Old Air (Borles); Alsatian Dance (Levadé); Selection from Pique Dame (Sippé); Serenade from The Damnation of Faust (Berlioz); Stiehlème (Fauré); Two Sonnets (Caplet); Réverie (Volpatti); Pieces for Harp (Tourner); La bonne Aventure (Hubans); Symphonie Potpourri (Rossini); Horizon chimérique (Fauré); Adoration (Filipezzi); Selection from Tannhäuser (Wagner); Piece for Flute (Pillois); Frühlingsliebe (Strauss); Selection from Toreador (Adam). After the Concert, News.  
**MADRID**  
**ARANJUEZ (EAQ),** 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Programme relayed from Madrid (EAJ7). 12 Midnight till Close Down. Programme in English by the I.B.C. Concert: I am so Anxious, Dear; Speak Easy; Fiesta; Soft Lights and Sweet Music; Hawaiian Waltz Medley; Song of the Vagabonds; Selection from Viktoria and her Hussar; Montana Moon. 12.30 a.m. (Friday), I.B.C. Goodnight Melody.  
**MADRID**  
**(EAJ7),** 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange and Programme for Children. 8.15, Topical Review. 8.30, Interval. 9.15, English Lesson. 9.30, Chimes, Time, Topical Review and Dramatic Programme. 12 Midnight, Chimes. 1.0 to 2.0 a.m. (Friday), Programme in English by the I.B.C. Light Music and Dance Music: There's a Cabin in the Pines; Wiesbaden March (Anderson); If you'll say "Yes" Chérie; The Shadow Waltz; Song, Absent (Glen); The Gold-Diggers' Song (Dubin); Sittin' in the Dark (Greer); Bom-Ba-Diddy-Bom-Bom; The School Song; Sweetheart Darlin'; A Broken Rosary; Let Bygones be Bygones; I cover the Waterfront; I've told every little Star; In the Valley of the Moon; Hold Me! The Grass is getting Greener all the Time. 2.0, I.B.C. Good-night Melody and Close Down.  
**MALMO.**—See Stockholm.  
**MILAN.**—See Turin.  
**MORAVSKA-OSTRAVA**  
1,137 kc/s, 263.8 metres; 11 kW.—5.30 p.m., German Transmission—Educational Talk. 6.0, See Prague. 7.10, See Bratislava. 7.25, Programme to be announced. 9.0, See Prague. 9.45 (approx.), Close Down.

**MOSCOW**  
**TRADES UNION,** 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather. 1.45 p.m., Weather Report. 2.0, Concert of Ukrainian, Armenian, Latvian and Russian Music. 3.0, German Lesson. 3.30, Literary Programme. 4.30, Talk: The U.S.S.R. 5.30, Programme from the Meyerhold Theatre. 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.  
**MOTALA.**—See Stockholm.  
**MUHLACKER.**—See Stuttgart.  
**MUNICH**  
563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Concert by the Station Orchestra, conducted by Karl List: Overture, Alessandro Stradella (Plotow); Ballet Music from Coppélia (Delibes); Four Pieces for String Orchestra (Volkmann); Waltz, The Blue Danube (Strauss); Adagietto and Minuet (Bizet). 4.45, Talk: Illnesses of Farm Animals. 5.5 (from Nürnberg), Suite for Viola da Gamba and Harpsichord (Bettingen) played by Robert Grothe and Maria Falmüller. 5.25, Talk: Germans in North America. 5.45, Time, Weather and Agricultural Notes. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Concert by the Concordia Zither Club. Soloist: Eyanell-Searché (Mandoline). 7.50, Veit Stoss—Radio Play (Breuer). 9.0, Time, Weather and News.  
**NAPLES.**—See Rome.  
**NOTODDEN.**—See Oslo.  
**OSLO**  
277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Orchestral Concert, relayed from Trondheim, 605 kc/s, 495.8 metres. 5.0, Divine Service. 6.0, Announcements, Weather and News. 6.30, Tenor Solos by Theodor Andresen: Aria from Joshua (Handel); Aria from Don Giovanni (Mozart); Aria from Der Freischütz (Weber); Aria from The Valkyrie (Wagner); Aria from Le Cid (Massenet). 7.0, Time Signal. 7.1, Agricultural Talk. 7.30, Orchestral Concert, relayed from Bergen, 824 kc/s, 364 metres. 8.0, Talk: The Political Situation. 8.20, Musical Programme. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Concert of Light Music. 9.45 (approx.), Close Down.  
**OSTERSUND.**—See Stockholm.

**LUXEMBOURG**  
352 kc/s, 1,191 metres; 200 kW. German Evening.—7.0 p.m., Gramophone Records: Pianoforte Concerto No. 2 in C minor, Op. 16 (Bachmannov), played by the Composer and the Philadelphia Philharmonic Orchestra. 7.45, Humorous Talk. 8.0, Concert by the Station Orchestra, conducted by Henri Pénis: Overture, Jocosia (Clemus); Ballad (Spies); Cradle Song (Pénis); Kaiserwalzer (Strauss); Suite No. 2 from L'Arlesienne (Bizet). 8.50, News in French. 9.0, Popular Concert. 9.50, News in German. 10.0, Gramophone Music. 10.15, Dance Music on Gramophone Records.  
**LWOW**  
788 kc/s, 381 metres; 16 kW.—6.5 p.m., See Warsaw. 10.5, Gramophone Music. 10.30 (approx.), Close Down.  
**LYONS**  
**LA DOUA,** 644 kc/s, 465.8 metres; 1.5 kW.—7.40 a.m., Radio Gazette for Lyons and the South-East. 8.30, Concert. Overture, The

PALERMO

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Notes, Giornale Radio and Agricultural Report. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Concert: Selection from The Dance of the Dragonflies (Lehár); Ideale (Tosti). 8.30, The Comedy of the Dumb Wife—Comedy in One Act (France). 9.0, Concert (cont'd.): Selection from Acqua cheta (Pietri); Selection from Le tre lune (Lombardo). 10.0, Giornale Radio.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Extracts from Plays (de Musset), on Gramophone Records. 7.15, Le Journal Parlé. 7.30, Programme for Children. 8.0, Talk. 8.5, Topical Talk. 8.35, Concert. 9.15, Gramophone Music. 10.30, News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m., Weather and Physical Culture. 7.45, Gramophone Records; Melody (Waldteufel); Serenata (Toselli); Polka, Diadumio; Gavotte (Hellmesberger). 8.0, Weather and Press Review. 12 Noon, Protestant Address. 12.30 p.m., Operetta Concert on Gramophone Records: Part I, Offenbach Music: Overture, Orpheus in the Underworld; Two Airs from La belle Héloïse; Six Melodies from The Tales of Hoffman; Part II: Audran Programme: Two Songs from Gillette de Narbonne; Two Melodies from Le Grand Mogol; Part III: Messenger Music: Two Airs from Veronique; Two Melodies from La Basoche; Air and Duet from L'amour masqué; Part IV: Hahn Music: C'est la Banlieue; Comme Frère et Soeur; Nous avons fait un beau Voyage. In the interval at 1.0, Exchange, News, and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.45, Talk: Compensation for Accidents at Work. 7.0, The Moral Crisis of our Day—Dialogue between Frédéric Lefèvre and Jules Romains. 7.20, Gramophone Records: La Poupée d'Arlequin (Darcy); L'Anneau d'argent (Chaminade); Chante, Rossignol, chante (Fijeau); Selection from The Merry Widow (Lehár); Mai (Hahn); Come, Gipsy, from The Gipsy Gipsy Princess (Kálmán). 7.45, German Press Review. 8.0, On purge Bébé—Play (Feydeau). In the interval at 8.40, Review by Christophe. 9.15, Press Review and News. 9.45, Gramophone Concert: The Nutcracker Suite (Tchaikovsky); Songs (Piercé): (a) Les trois petits oiseaux, (b) Marionnettes, (c) Ils étaient trois petits chats blancs; Concerto for Clarinets (Weber); Arioso from Benvenuto Cellini (Diaz); Spanish Rhapsody (Ravel).

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.86 metres and 25.27 metres.—7.45 p.m., KDKA Home Forum. 8.0, Programme to be announced. 8.15, Quilting Party. 8.20, Words and Music, from New York. 8.45, Pennsylvania Women's Federation. 9.0, Betty and Bob, from New York. 9.15, Thursday Special, from New York. 9.30, News and Markets. 9.45, Thursday Special, from New York. 10.0, Federation of Women's Clubs, from New York. 10.15, KDKA Kiddies' Klub. 10.30, The Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News and Piano Classics. 11.15, Sports. Pat Haley. 11.30, Pittsburgh Spotlights. 11.45, Lowell Thomas, from New York. 12 Midnight, Amos 'n' Andy, from New York. 12.15 a.m. (Friday), Marvellous Melodies. 12.30, Concert Footlights, from New York. 12.45, Pathé News of the Air. 1.0 to 4.0, New York Relay. 1.0, Captain Diamond. 1.30, Adventures in Health. 1.45, Crooning Choir. 2.0, Death Valley Days. 2.30, Lady Esther Serenade. 3.0, Hands across the Border. 3.30, Echoes of the Palisades.

FORSGRUND.—See Oslo.

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Brno. 3.50, Musical Programme for Children. 4.15, Talk for Workers. 4.25, Gramophone Music. 4.35, Elementary French Lesson. 4.50, Gramophone Music. 5.5, Agricultural Talk. 5.15, Talk on Foreign Politics. 5.25, News in German. 5.30, German Transmission: Review of New Publications and Agricultural Programme. 6.0, Time and News. 6.10, Military Band Concert, conducted by Pesta. Overture, Orpheus in the Underworld (Offenbach); Selection from Dalibor (Smetana); Selection from The Gipsy Baron (Strauss); Intermezzo, Dance of the Pigmies (Oberthor); Tattoo (Pesta); Potpourri of Russian Songs (Svare). 7.5, Topical Talk. 7.20 to 9.0, Programme to be announced. 9.0, News, Review of the Day and Sports Notes. 9.15, Introductory Talk to the following transmission (in Czech and French): Smetana and his Works. 9.30, Symphonic Poem, Vyselrad, from the Suite, My Country (Smetana), by the Station Orchestra, conducted by Jeremias. 9.45 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Geneva), Gramophone Concert. 12 Noon

OCT. 19th THURSDAY continued

(from Geneva), Financial Notes. 12.10 p.m. (from Geneva), Gramophone Concert (cont'd.). 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0 (from Geneva), Gramophone Concert. 4.0 (from Geneva), Concert by Students of the Conservatoire: Piano-forte Solos: (a) Barcarolle (Chopin), (b) Bourrée fantasque (Chabrier); Violin Solo: Aria, Satyres et Dryades and Valse caprice (Zsolt). 4.30 (from Geneva), Gramophone Concert (cont'd.). 5.0 (from Lausanne), Concert. 5.30 (from Lausanne), Talk on Physical Culture. 5.55 (from Lausanne), German Lesson. 6.20 (from Lausanne), Tourist Report. 6.30 (from Lausanne), Agricultural Talk. 6.59 (from Lausanne), Weather Report. 7.0, Concert by the Radio-Suisse Romande Orchestra: Concerto grosso (Manfredini); Four Gigue (Mattheson-Theodore Appia); Suite for String Orchestra (Grieg); Serenade (Lauter); Pieces for String Orchestra (Theodore Appia). 8.0 (from Lausanne), Concert by a Russian Balalaika Orchestra, conducted by Tchernoyaroff. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

REYKJAVIK

1,200 metres; 21 kW.—11.0, Weather Forecast. 1.15 p.m., Variety Programme. 4.0, Weather Forecast. 8.10, Weather Forecast. 8.20, Music and Announcements. 9.0, Light Music. 10.0, Time and News. 10.30, Music by the Radio Trio, followed by Arias on Gramophone Records.

RJUKAN.—See Oslo.

ROME

Call 1R0, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres, from 7.45 p.m., and 2R0, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—12.10 to 1.0, Concert relayed from Turin. In the interval from 12.30 to 12.35, Giornale Radio and Exchange. 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.50, Giornale Radio and Exchange. 4.0, Talk. 4.10, Weather. 4.15 to 5.0, Violin and Song Recital: Maria Flori (Violin), Romano Rasponi (Baritone), and Guada (Caputo) (Soprano). Violin Solos: (a) Pastorale (Bocherini), (b) Capriccio all'antica (Sinigaglia), (c) Burlesque (Sonima); Baritone Solos: (a) Aria from The Damnation of Faust (Berlioz), (b) Aria from Germania (Franchetti), (c) Stornellata sull'Arno (Billi); Soprano Solos: (a) Zingarella spagnuola (Mercadante), (b) Rispetto (Bevenuti), (c) Aria from Fra Diavolo (Auber); Violin Solo: Scenes from the Czaradas (Hrubý). 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopolavoro Announcements and Tourist Talk. 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Piano-forte Recital by Cesarina Buonera. 7.45, Programme to be announced. 9.0, Piano-forte Recital by Ornella Puliti-Santoliquido: Four Popular Romanian Dances (Béla Bartók); Two Film Studies (Castelnuovo-Desedesco): (a) Charlot, (b) Topolino. 9.15 (approx.), Dance Music. 10.0, Giornale Radio.

SALZBURG.—See Vienna.

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—12.45 a.m. (Friday), Stock Reports. 1.0 to 3.15, New York Relay. 1.0, Popular Programme. 2.0, Captain Henry's Show Boat. 3.0, Popular Programme, followed by Programme Résumé.

SCHWEIZERISCHER LANDESENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne), Gymnastics. 11.0 (from Zürich), Concert by the Small Station Orchestra, conducted by Max Scheerbaum. 12.25 p.m. (from Zürich), Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Zürich), Light Orchestral Concert. 3.0, See Radio Suisse-Romande. 5.0 (from Basle), Songs on Gramophone Records. 5.30 (from Basle), Readings. 6.0 (from Basle), Time, Weather and Traffic Report. 6.10, Concert of Light Music by the Radio Orchestra. 6.40 (from Basle), Talk: Poverty, the Driving Force of Rainer Maria Rilke's Genius. 7.10 (from Basle), Concert of Old English Trio Sonatas. 8.0, Weather and News. 8.10 (from Basle), When the leaves fall. . . 9.15 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sunda-

vall, 554 kc/s, 542 metres.—1.45 p.m., Broadcast for Schools. 4.5, Divine Service from Uppsala, 662 kc/s (453.2 metres). 4.30, Programme for Children. 4.45, Gramophone Music. 5.45, Elementary English Lesson. 6.30, Military Band Concert, conducted by Ivar Widner; Overture, Zampa (Hérold); Selection from La Bohème (Puccini); Two Songs; Valse lente (Merikanto); Selection from The Count of Luxembourg (Lehár); Italian March (Canzano). 7.15, The Silver Cord—Play. 9.0, Concert of Light Music: Potpourri (Leitschner); Ballet Music from Coppélia (Delibes); Waltz, Mary (Egen); Russian Song (Widen); Spanish Tango (Hyllbon); Grieg Potpourri (Urbach). 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Concert: Selection from Rosamund (Schubert); Waltz in A (Brahms); Slav Dance (Dvořák); Petite Suite (Debussy); Ballet Music from Le Cid (Massenet); Minuet from Manon (Massenet); Dance of the Sylphs from The Damnation of Faust (Berlioz); Ballet Music from Gretina Green (Guiraud); Ballet Suites from Cydalise et le Chevre-Pied (Piercé); Valse romantique (Séverac); Overture, Le Roi d'ys (Lalo). 12.45 p.m., News. 1.0, Time. 1.1, Exchange. 1.5, Orchestral Concert, conducted by Maurice de Villers: Overture, The Bartered Bride (Smetana); Symphonic Extracts from The Mastersingers (Wagner); Danse macabre (Saint-Saëns); Fête galante (Lacôme); Héloïse (Paul Pierné). 2.0, Programme for Children. 4.0, Light Music on Gramophone Records. 4.45, French Elocution Lesson. 5.0, Orchestral Concert, conducted by Roskam; March (Suppé); Waltz, Amabilis (Scassola); Overture, Der Wildschütz (Lortzing); Potpourri, From Gluck to Wagner (Schreiner); Divertissement (Filipucci); Piano-forte Solo; An den Frühling (Grieg); Sons bois (Staub); Selection from Der Obersteiger (Zeller). 6.0, Talk in German: French Civilisation. 6.15, Talk for Women. 6.30, Gramophone Concert. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Literary Programme, relayed from Lyons (La Doua), 644 kc/s, 465.8 metres. 10.30 (approx.), Press Review.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.35 p.m., Concert of Operetta Music by the Pforzheimer Symphony Orchestra, relayed from Pforzheim. Conductor: Hans Leger, March from The Merry Widow (Lehár); Prelude to Eva (Lehár); Selection from Where the Lark sings (Lehár); Waltz, Samt und Seide (Zielner); Rendez-vous bei Lehár (Hrubý). 2.0, Programme for Children. 3.0, See Frankfurt. 5.0, Spanish Lesson. 5.20, Reading (Franz Heinrich Staerk). 5.35, Reading (Walter Luz). 5.50, Time and Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, See Frankfurt. 7.10, See Langenberg. 9.0, See Frankfurt. 9.20, Talk: Things you should know. . . 9.30, News. 9.45, Concert of Light Music. 10.0, An Unfinished Symphony—Programme arranged by Fritz Gauss. 11.0 till Close Down, See Frankfurt. 12 Midnight (approx.), Close Down.

SUNDSVALL.—See Stockholm.

TOULOUSE

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Dance Music. 6.30, Popular Songs. 6.45, Extracts from L'Histoire du soldat (Stravinsky). 7.0, Accordion Solos. 7.15, News. 7.30, Songs from Sound Films. 7.45, Music by a Viennese Orchestra. 8.15, Operetta Concert: L'hesite from Enlevé-moi (Gaba-roche); Quoi Pippo from La Mascotte (Andran); En cueillant du muguet from Marius à Paris (Méhieux); Chanson du petit bossu from Le petit due (Lecocq); Ne parlez moi de mon courage from Les Cloches de Corneville (Planquette); Air du rossignol from Les noces de Jeanette (Masse); Selection from Nina Rosa (Romberg); Song from The Merry Widow (Lehár). 8.45, Orchestral Music: Overture, Die Fledermaus (Joh. Strauss); Marche joyeuse (Chabrier); Overture, Sicilian Vespers (Verdi). 9.0, Prince Igor—Opera (Borodin)—concert Version. 9.45, Sponsored Concert. 10.15, North African News. 10.30, Concert for Listeners in Morocco. 11.0, Organ Solos. 11.15, Dance Music. 12 Midnight, News. 12.5 a.m. (Friday), Symphonic Music: Overture, Il Seraglio (Mozart); Hurray! die Musik kommt (Zimmer); Selection from Il Guarany (Gomez); Symphony—The Pacific (Honheger). 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

TROMSHEIM.—See Oslo.

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Gramophone Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio. Dopolavoro, Announcements and Gramophone Music. 6.0, Time, Tourist Talk and Gramophone Music. 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Weather and Gramophone Music. 7.30, Gramophone Concert. 9.0, Police Band Concert, conducted by Marchesini. In the intervals, Talk and Theatre Notes. 10.0, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—11.0 to 11.5 a.m., Religious Information in French. 8.10 to 8.15 p.m., Religious Information in Italian.

VIENNA

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,052 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer. In the interval at 12 Noon, Time and News. 1.0, Interval. 2.0, Time, Weather, Exchange and Market Prices. 2.20, Talk: Electricity in the Kitchen. 2.30, Programme for Children. 2.55, Italian Opera Music on Gramophone Records: Chorus from the Third Act of La Bohème (Puccini); Quintet from A Masked Ball (Verdi); Duet from Madame Butterfly (Puccini); Sextet from Lucia di Lammermoor (Donizetti); Finale from The First Act of Tosca (Puccini); Duet from Aida (Verdi); Quartet from Rigoletto (Verdi). 3.45, St. Pölten—Talk and Reading. 4.5, Theatre Talk. 4.10, Talk for Women. 4.30, Song Recital by Josef Stransky (Soprano): 5.10, Talk arranged by the Chamber of Commerce. 5.35, Technical Talk. 6.0, Concert by the Wiener Symphoniker, conducted by Max Schönherr. Soloist: Walter Landauer (Piano-forte): Military March (Schubert); Musik zu einem Waltz, Donaumärschen (Chmel); Phantasie-ballett (Scassola); Suite from Sonnenstrahl (Farkas); Abschiedswalzer (Joh. Strauss); Overture, Ein Opernball (Heuberger). In the interval at 6.35, Time, Weather, and Programme Announcements. 7.15, Talk: Gustav Frensen. 7.45, Concert by the Wiener Symphoniker, the Opera House Choir, and Luise Helletsgruber (Soprano): Symphony No. 8 in B minor (Schubert); Lacrimosa from Requiem (Mozart); Finale from The First Act of Loreley (Mendelssohn); Air from Khovantchina (Musorgsky); Aria from Turandot (Puccini); Chorus from Manuel Venegas (Wolf); Adagio from the Ninth Symphony in D minor (Bruckner). 9.20, News. 9.35, Gramophone Concert: Overture, Der Waldmeister (Joh. Strauss); Air from Countess Maritza (Kálmán); March from Die Dame mit dem Regenbogen (Gilbert); Old Viennese Melodies (Pollak); Air from Eine Frau, die weiss was sie will (O. Strauss); Tango, Du schwarzer Zigeuner (Vacek); Potpourri, Bravo, Bravo (Dostal); Was hat eine Frau von der Treue (Abraham); Slow Foxtro from Eine Frau, die weiss was sie will (O. Strauss); March from White Horse Inn (Benatzky). After the concert, News.

WARSAW

212.5 kc/s, 1,411 metres; 126 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Gramophone Music. 11.30, Radio Journal and Weather. 11.35, Concert by the Philharmonie Orchestra, conducted by Wolfstall, with Introductory Talk. 1.0 p.m., Interval. 2.30, Economic Notes. 2.40, Light Music by the Cyganerka Theatre Orchestra, conducted by Gorzynski. Soloists: St. Gorska (Songs) and Gimpel (Piano-forte). 3.40, Talk for Women. 3.55, Concert of Chamber Music: Sonata in F (Mozart); Sonata in D Minor (Saint-Saëns). 4.50, Agricultural Talk. 5.0, Talk on Economics. 5.20, Light Music on Gramophone Records. 5.40, Programme Announcements. 5.45, Miscellaneous Items. 6.5, Topical Talk. 6.20, Chopin Programme. 7.50, Radio Journal. 8.0, Wireless Talk. 8.15, Concert by the Station Symphony Orchestra, conducted by Oziminski. Soloist: Werminski (Songs). Overture, Fidelio (Beethoven); Serenade for Strings (Haydn); Selection from Tiefland (d'Albert) Aria from Fidelio (Beethoven); Mariette's Song from Die tote Stadt (Korn-gold); Ballet Music from William Tell (Rossini); Oriental Suite (Yoshitomo); Japanese Songs (Maklakewicz); Popular Songs (Szopski); Ballet Music from Il Trovatore (Verdi); March (Rapacki). In an interval at 9.0, Sports Notes. 9.45, Dance Music from the Adria Café. In the interval at 10.0, Weather and Police Notes.

WILNO

533 kc/s, 563 metres; 16 kW.—6.0 p.m., Programme Announcements. 6.5 till Close Down, See Warsaw.

ZURICH.—See Schweizerischer Landessender.

FRIDAY
OCTOBER THE TWENTIETH

ALGIERS

324 kc/s, 364 metres; 13 kW.—7.0 p.m., Financial Report and Exchange. 7.10, Shipping Notes. 7.15, Agricultural Report and Weather. 7.20, Agricultural Review. 7.35, Concert by a Vocal Quintet. 7.55, News. 8.0, Time Signal. 8.2, Lottery Results. 8.10, Symphony Concert, conducted by Henry Defosse: Symphony, La Reine (Haydn); Selection from Cydalise et le chevre-pied (Piccini). 8.40, News. 8.45, Gramophone Records. 9.0, Concert (cont.): Prelude and Cortège from Dejanire (Saint-Saëns); Clarinet Concerto (Mozart); Suite (Tchaikovsky). 9.30, News. 9.35, Concert by a Gigan Band. 9.55, News.

ATHLONE

125 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time, Weather, Stock Report and Gramophone Concert. 6.0, Programme for Children. 6.45, News. 7.0, Gardening Talk. 7.15, Literary and Dramatic Talk. 7.30, Time Signal. 7.31, Operatic Ballad Music by the Station Orchestra. 7.45, Baritone Solos by Leslie Jones. 8.0, The Station Orchestra. 8.15, Tenor Solos by Tony Hughes. 8.30, Variety Programme by the Misses Wickham. 8.50, Mezzo-Soprano Solos by Cecily Kenny. 9.5, The Station Orchestra. 9.30 to 10.30, Programme by the I.B.C. (Ireland) Ltd. 9.30, Concert of Opera Music. Selection from La Bohème (Puccini); On with the Motley from Pagliacci (Leoncavallo); Intermezzo from Cavalleria rusticana (Mascagni); Tick, Tock, from The Toy-maker of Nuremberg (Glass); Barcarolle from The Tales of Hoffman (Offenbach); O Star of Eve, from Tannhäuser (Wagner); Brindisi from La Traviata (Verdi); Soldier's Songs (Gungl); Wireless World Announcement. 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd.: My Wishing Song (Burke); Maybe I love you too much (Berlioz); Puss, Puss, Puss (Hargreaves); Tacing Commentary; I'm forgetting myself or you (Meyer); Little Sunshine (Krausz); Jary Rose; I've found a Right Girl (Lupino). 10.30, I.B.C. Good-night Melody, followed by News and Weather. 10.40, Musical Programme. 11.0 (approx.), Close Down.

BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Concert by the Station Trio. 7.0, Request Programme. 7.30, Exchange and Request Programme (cont.). 8.0, Gramophone Music, followed by News. 8.0, Chimes from the Cathedral. Weather, Messages to Seamen, Exchange and Market Prices. 9.10, Concert by the Station Orchestra: March, The Lion (Hellott); Selection from Maruxa (Vives); Waltz, Heures d'ivresse (de Bozi and Cools); Variation (Wihlts); Serenade to Colombine (Juel-Fredriksen); Prelude to the Second Act of El caserio (Guridi). 10.0, Debussy Programme. 10.30, Dance Music from the Casa Libre. In the interval at 11.0, News. 12 midnight (approx.), Close Down.

BARI

112 kc/s, 269.8 metres; 20 kW.—11.30 a.m. to 3.30 p.m., See Rome. 3.30, Gramophone records. 3.55 to 5.0, See Rome. 5.0, News in Albanian. 5.45 (approx.) till Close Down, see Rome.

ASLE.—See Schweizerischer Landessender.

BELGRADE

97 kc/s, 430.4 metres; 2.8 kW.—6.0 p.m., Concert by the Radio Orchestra. 7.0, Programme from Zagreb. 977 kc/s, 307 metres. 8.0, Time and News. 9.10 (approx.), Gramophone Music. 9.35, Gigan Music from the bordjevic Restaurant.

BERLIN

DEUTSCHLANDSENDER, 183.5 kc/s, 1,635 metres 60 kW.—1.0 p.m., Opera and Operetta Music on Gramophone Records: Overture, Oberon (Weber); Introduction to Act II of Lohengrin (Wagner); Overture, 'annhäuser (Wagner); Song from Le Posillon de Longjumeau (Adam); Aria from I Trovatore (Verdi); Selection from I Pagacci (Leoncavallo); Aria from Cavalleria rusticana (Mascagni); Overture, Der Wälschenschmid (Lortzing); Selection from The Hipsy Baron (Joh. Strauss); Overture, Eine Nacht in Venedig (Joh. Strauss). 2.0, Programme for Girls. 2.30, Weather and Exchange. 2.45, Reading from Das kaiserbuch (Paul Ernst). 3.0, See Leipzig. 4.0, Talk: germanische Heroic Legends. 4.25, Pianoforte and Song Recital by Richard Laugs and Margarethe Klose; Pianoforte: Variations on an Old German Love Song (Kuhn); Songs (Rudi Stephan): (a) Kytther, (b) Wendwehen, (c) In Nachbars Garten, (d) ontang, (e) Dir, (f) Im Einschlafen, (g) liedlich, (h) Heimat. 5.0, A Poem. 5.5, Talk: The Skilled Trades through the Centuries. 5.20, Talk: The German Theatre under the New Régime. 5.45, Weather and News. 6.0, Transmission for all German stations, relayed from Munich. 7.0, Toy-maker's Motto. 7.5, The Listeners' Half Hour. 7.30, Das Schweineschlachten—Peasant comedy (August Hinrichs). 9.0, Weather and News. 9.45, Weather. 10.0, Concert from Hamburg. 11.0 (approx.), Close Down.

BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—6.0 p.m., Talk: Small Pleasures. 5.15, A Visit to a Pianoforte Maker in Luckenwalde. 5.30, The Funkstunde informs its Listeners. 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Munich. 7.5, Dance Music on Gramophone Records. 7.30, Variety Programme by Carola Ihlenburg and the Schwarz-Weiss Players. 8.0, Nature in Contemporary Tone Poems—Concert by the Station Orchestra, conducted by Waldemar von Vultée: Frühlingsbilder, Op. 35 (Strauss); Symphonic Suite, Die Jahreszeiten, Op. 26 (Unger). 9.0, News. 9.10 (approx.), Concert of Light Music by the Wilfried Krüger Orchestra, relayed from the Tramé Restaurant. In an interval at 10.0, Theatre and Film Review. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

BORDEAUX-LAFAYETTE

985 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.35, News. 7.40, Educational Programme. 7.55, Lottery Results. 8.0, Spanish Lesson. 8.15, News. 8.30, Concert by the Symphony Orchestra and Soloists.

BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—5.20 p.m., Humorous Story. 5.35, Gramophone Music. 5.40, Telegraphy Lesson. 5.55, Hints for Housewives. 6.0 till Close Down, See Prague. 9.45 (approx.), Close Down.

BREMEN.—See Hamburg.

BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12 Noon, Weather. 12.5 p.m., Gramophone Concert of Popular Music. 12.45, News. 1.10, Song Recital by Alfred Heimeyer (Bass). Songs (Schumann): (a) Tallsmann, (b) Auf dem Rhein, (c) Freisinn, (d) Frühlingsfahrt; Songs (Schubert): (a) Der Wanderer, (b) Aufenthalt, (c) Prometheus, (d) Nachgesang 1.35, Gramophone Records. 2.0, Agricultural Prices. 2.15, Programme for Young People. 3.0, Gramophone Concert. Overture, The Magic Flute (Mozart); Selection from Mariana (Wallace); Serenata di baci (Michele); Minuet from the Court of Louis XIV; Potpourri (Puccini); Duet from Madame Butterfly (Puccini); Potpourri, Die Welt im Lied (Intrator); Waltz from The Arabian Nights (Joh. Strauss); Fourth Movement from the Caucasian Suite (Ippolotov); Anfang des Sardar; Overture, Mignon (Thomas); Waltz from Eva (Lehár); Paraphrase on Annie Laurie; Death of Othello from Othello (Verdi); Wedding Day on Troldhaugen (Greig); Waltz, Leuchtkefährn (E. Strauss); Intermezzo, Roter Mohr (Siede); March, Alte Soldaten (Kirsten). 4.45, Agricultural Prices. 4.50 (approx.), Discussion. 5.10, Programme to be announced. 5.35, Talk: The Change in the Silesian Landscape in the Last Seven Centuries. 5.50, Cattle Market Prices. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, News. 7.10, Concert of Folk Dances relayed from the Concert House. 8.30, Radio Report for Workers. 9.0, News. 9.30, Concert from Berlin (Funkstunde). 11.0 (approx.), Close Down.

BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission: News, Sports Notes, Topical Talk, Literary Talk and Talk on the Psychology of Animals. 6.0 till Close Down, See Prague. 9.45 (approx.), Close Down.

BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans. 1.0 p.m., Le Journal Parlé. 1.10, Gramophone Music. 1.30, Pendant le bal—Sketch (Pailleron). 1.50 (Gramophone Music (cont.)). 5.0, Game Concert by the Station Symphony Orchestra, conducted by Kumps. March, Le Père in Victoire; La Houssarde; Selection from Cocorico; Cello Solo: Cantilène; Selection from Les Saltimbanques; Extase; Contemplation et pascimanie; Selection from Hans the Flute Player; Valse des heures. 6.0, Talk: The League of Nations and the Colonies. 6.15, Request Gramophone Records. 6.30, Pianoforte Solos by Wilmet: Italian Concerto (Bach); Theme with Variations on the Note A B E G G (Schumann); Nocturne in E Flat (Chopin); Prelude in A Minor (Debussy); Reflets dans l'eau (Debussy); Seguidillas (Albéniz). 7.0, Extracts from Daphnis et Chloé (Ravel), on Gramophone Records. 7.15, Talk: Social Service. 7.30, Legal Talk and Literary Review. 8.0,

Concert by the Station Symphony Orchestra, conducted by Kumps. Soloist: Mlle. Denyse Cevalmoustier (Songs). Overture, Light Cavalry (Suppé); Selection from Die geschienne Frau (Lehar); Waltz, Acclamations (Waldeufel); Songs: (a) Nell (Fauré), (b) Adieu (Fauré); (c) Noël des enfants qui n'ont plus de maison (Debussy), (d) Pensées d'automne (Bernart), (e) Les cheveux d'or (Radoux), (f) Je la Poursuis (Debaar); Intermezzo (van Oost); La flûte de Pan (van Oost); Allegretto (Dateau); Scherzo (d'Agryès). 8.45, Talk: The Parliamentary System and its Possibilities. 9.0, Concert (cont.): Overture, Phédre (Massenet); La chute des feuilles (Massenet); Suite d'Arlequin (Massenet); Ballet Music from Lakmé (Delibes); Samson and Delilah (Saint-Saëns), and Romeo and Juliet (Gounod). In the interval, Items by Olga Ugané. 10.0, Le Journal Parlé. 10.10, La Brabaçonne.

BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish. 12 Noon, Gramophone Concert. 1.0 p.m., Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans: Petite marche viennoise (Kreisler); Suite from The Merchant of Venice (Sullivan); Valse poudrée (Poppy); Selection from Paganini (Lehár); Violin Solo: Slav Serenade (Doullez); Andalous (De Tacye); Selection from Le Comte Othello (Moretti). 5.0, Concert of Light Music by the Radio Orchestra, conducted by André: Fuxrott, Gin and It (Parsons); Selection from Frühling im Wienerwald (Ascher); Rumba, Palmira (Simons); Waltz for Saxophone (Macker); Selection from The Student Prince (Romberg); Oriental Fox-trot, The Persian Caravan (Benson); Waltz, Dolores (Waldeufel); Blues for Trumpet (Lindley); One-step (Wangermée). 6.0, Illustrated Talk on Mazzoza (Liszt), Don Juan (Richard Strauss), and the Prélude à l'après-midi d'un faune (Debussy). 7.0, Concert by the Small Station Orchestra, conducted by Leemans: Overture, The Cunning Peasant (Dvorák); Melody (Rubinstein); Flemish Procession (Leemans); Dance (Roels); Ballet Music from Philémon et Baucis (Gounod). 7.30, Journal Parlé. 8.0, Concert by the Radio Orchestra, conducted by André: Overture burlesque (Méhul); Extracts from The Fair Maid of Perth (Bizet); Jazz in the Zoo (Basilowsky). 8.30, Flags on the Matterhorn—Radio Play (Gasbarra), translated from the German. 9.30, Concert (cont.): Serenade (Widor); Oboe Solo: Scènes écossaises (Godard); Paysage flamand (De Tacye). 10.0, Journal Parlé.

BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra: March (Oscheit); Waltz, Ballgeliüster (Meyer-Helmund); Overture, Maritana (Wallace); Selection from La Gioconda (Ponchielli); Fox-trot from Die Fledermaus (Joh. Strauss-Poehmann); Serenade (Klose); Egyptian Suite (Thiele); Suite, Au cirque (Armandola); Two Intermezzi (Fétras). In the interval at 5.0, Radio Journal. 6.0, Reading. 6.20, Educational Programme. 6.40, La Traviata—Opera in Four Acts (Verdi) on Gramophone Records. In the intervals, Radio Journal. After the Opera, Light Music, relayed from a Restaurant.

BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 840 metres from 6.25 p.m. till Close Down. 1.0 p.m., Gigh on Gramophone Records. 3.0, Reading. 4.0, Talk. 4.30, Concert by the Horvath Gigan Band. 5.0, Shorthand Lesson. 5.45, Talk on the following Transmission. 6.30, Relay from the Opera House. In the interval, News. After the Programme, Concert by the Ludwig Veres Gigan Band and the Georg Guttenberg Dance Band, relayed from the Café Ostend: Soloist: Paul Kalmar (Songs).

CASSEL.—See Frankfurt

COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall. 11.2, Concert by the Leonard Gyldmark String Ensemble, relayed from the Bellevue Strandhotel. 1.0 p.m., Interval. 1.40, Pianoforte Recital by Povl Ingerslev-Jensen: Bourrée in B Minor (Bach); Nocturne in E Flat, Op. 62, No. 2 (Chopin); Sonata No. 15 in C (Mozart). 2.0, Concert by the Teddy Peterson Orchestra, relayed from the Wivex Restaurant. 4.0, Reading (Kristian Gudmundson). 4.30, Exchange and Fish Market Prices. 4.45, Talk: The History of the Danish Theatre. 5.15, Elementary German Lesson. 5.45, Weather. 5.54, Announcements. 6.0, News. 6.15, Time Signal. 6.30, Talk: Unemployment among Young People. 7.0, Time Signal from the Town Hall. 7.1, Programme by Per

Knutzon. 7.10, Pianoforte Sonata No. 2 in F (Mozart) by Folmer Jensen. 7.30, Danish Songs by a Students' Choir, conducted by Johan Hye-Knudsen. 7.55, Sörensen—Radio Play (Jesper Ewald). 8.40, Concert by a Students' Choir, conducted by Johan Hye-Knudsen. 9.0, News. 9.15, Talk. 9.30, Concert by a Balalaika Quintet: Potpourri of Russian Melodies; Romance (Gliuka); Waltz (Dofla); Barcarolle (Malov); Senenade (An karany); Gipsy Romance; Russian Folk Dance. 10.0, Dance Music by the Aage Juhl-Thomsen Band, relayed from the National Scala. In an interval at 11.0, Time Signal and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11 a.m. to 12 Noon, Programme in English by the I.B.C. 11.0, Happy Hour. Part I. Orchestral Concert. I do like to be beside the seaside (Glover); The Way to the Heart (Lincke); Chorus, Your Song of Paradise; The Enchanted Forest (Ganglberger); Beautiful (Gillspic); Chorus, Pale Moon; The Little Company (Spain). Part II. Hawaiian Band: The Blue Bird; Palikiko Blues; Dream Girl of Yesterday; In Vienna one Night; Manilla Moon; Hawaiian Love; My South Sea Home; Maria Mari; signature Tune. 12 Noon, Programme in French. 4.30, to 6.0 p.m., Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Concert for Southampton and Winchester—Gramophone Records. Signature Tune; Night by the Sea; The Grass is gettin' greener all the time; Selection of Stephen Foster Melodies; Stop the Sun, stop the Moon; Gipsy Moon; Clarinetitis; Brother, can you spare a Dime? Since you went away; What aloha means. 5.30, Concert for Bournemouth and Weymouth. Light Orchestral Concert. Spring Blossoms awaken (Löhr); Pianoforte Solo, He wanted Adventure (Waller); The Song of the Rose (McCullough); When the Convent Bell is ringing (Trevor); Viola Solo: Oh could I but express in Song; Song, That's my Home (Rosing); My Lady Dainty; The Valley of the Poppies (Ancliffe); Signature Tune. 6.0, Programme in French. 10.0 till Close Down, Programme in English by the I.B.C. 10.0, Signature Tune, The Bells of Normandy; Lazybones; I wish I had Wings; Adorable; Learn to Croon; Oh! Johanna; I always keep my Girl out late; Sadie the Skater; Thank Heaven for you; At the Old Pig and Whistle; Seven Years with the wrong Woman; I can't remember; Happy Ending; There's a Cabin in the Pines; Sergeant Flagg and Sergeant Quirt; Drifting down the Shalimar; I gotta Right to Sing the Blues; Signature Tune. 11.0, Talkie Time. Signature Tune, Sittin' in the Dark; Three's a Crowd; Selection of Talkie Gems; Love me to-night (Hart); Heaven will protect an Honest Girl; You are my Heart's Delight, from The Land of Smiles (Lehár); Why has a cow got four legs?; The Gold-Digger's Song (Dubin); Selection from Love me to-night (Spoliansky); Signature Tune. 11.30, Club Concert for Tonbridge and Sevenoaks Listeners. Part I. Orchestral Concert. Signature Tune, The Chum Song; La Czarine (Ganne); Song, Mountain Lovers (Squire); Velta Medley (Verney); Selection from Give me a Ring (Broones); Song, Lay your Head on my Shoulder (Conrad); Gridiron Club March (Souza); Pianoforte Solo, When Day is done (de Sylva); Pride of the Wolverines (Souza). 12.5 a.m. (Saturday), News Bulletin in English. 12.10, Club Concert. Part II. Cabin in the Cotton; Harlem Madness; Kalua; Wall Street Walk; Dancing Time; Signature Tune; Under a Blanket of Blue; You are too Beautiful; Let's call it a Day; Sweet Dreams, pretty Lady; Peter, Peter; The Old Spinning Wheel; Tick, Tock; I've got to sing a Toreh Song; Signature Tune. 1.0, Dance Music. Signature Tune, Bells of Normandy; No more Love; Maybe I love you too much; Pink Elephants; Waltzing in a Dream; You'll never get up to Heaven that way; Sundown in a little Green Hollow; Twelfth Street Rag; It's Sunday down in Caroline; Isn't it heavenly?; Reflections in the Water; From me to you; Hot Feet; Love is the Thing; Down in the Valley; Tick, Tock; P.C.123. 2.0, I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, News. 12.35, See Stuttgart. 1.30, Interval. 2.30, Weather. 2.40, Time and Economic Notes. 3.0, See Leipzig. 5.0, See Langenberg. 5.20, Talk: Germany's Racial Types. 5.35, Talk: The Modern Attitude towards Asceticism. 5.50, News. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Topical Talk. 7.10, See Stuttgart. 9.0, News. 9.20, See Stuttgart. 9.30, News. 9.45, Concert of Light Music. 10.0, Concert by the Station Orchestra, conducted by Reinhold Merten: Waltz, Studentenlust (Joh. Strauss); Polka-Mazurka, Der Klügere gibt nach (Joh. Strauss); Waltz from Donawitz

OCT. 20th **FRIDAY** continued

(Bayer); Risetete Waltz (Lecocq); Polka, Jägerlatein (Komzak); Waltz, Frauenwürde (Joh. Strauss); Waltz, Denksprüche (E. Strauss); Polka, Die Lustigmacherin (Ziehrer); Waltz, Jet' aime (Waldteufel); Waltz, Herbststimmung (Lincke); Gallop, Zeit ist Geld (Lincke). 11.0, Talk: German Thought and German Culture from Goethe to Nietzsche. 11.45 (approx.), Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hannover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m., Transmission for all German Stations, relayed from Munich. 7.0, Political Address. 7.10 (from Kiel), Concert of Romantic Music for String Orchestra. The Unemployed Musicians' Orchestra, conducted by Böring, Wanderlied (Kainpf); Extracts from Anakreon, Op. 50 (Niemann); Two Bagatelles (Kann): (a) Moonlight, (b) Minuet; Serenade (Gerlach). 8.10, Vun't bunte Leben—Programme in Dialect, with Music by Hans Friedrich Michelsen. 9.0, Time, Weather and News. 9.20, Concert by the Hamburg Philharmonic Orchestra, conducted by Eibenschütz: Overture, The Bartered Bride (Smetana); Abendlied (Schumann); Träumerei (Schumann); Dance of the Falling Leaves from the Suite, From Finland (Palmgren); Theme and Variations from Suite ancienne (Halvorsen); Selection from the Music to the Pantomime, Der Gaukler und das Klingelspiel (Erdlen); Overture, Der lustige Krieg (Strauss); Selection from The Land of Smiles (Lehár); Waltz, Mon rêve (Waldteufel).

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Dance Music on Gramophone Records. In the intervals at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office, with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.15, Programme for Children. 2.40, Talk for Women. 3.0, Concert by the Small Station Orchestra, conducted by Eugen Wilken: Overture, The Mikado (Sullivan); Arabian Gourd (Rust); Ballet Scene (Armandola); Mon rêve (Waldteufel); Suite, An Evening in Petersburg (Meyer-Helmund); Selection from The Duchess of Chicago (Kálmán); Overture, Der Bajazzo (Czibulka); Suite of Marches (Hufeld); Waltz, Paysage d'automne (Waldteufel) Selection from Drei Wünsche (Ziehrer). In the interval at 3.50 (approx.), Book Review. 4.50, Programme for the Country Woman. 5.15, Agricultural Prices. 5.25, Lieder Recital by Tina Zimmermann-Grassow. Songs (Weber): (a) Die Zeit, (b) Es stürmt auf der Flür, (c) Bach, Echo und Kuss, (d) Das Mädchen an das erste Schneeglöckchen; Songs (Schubert): (a) Wer nie sein Brot mit Tränen ass, (b) Am Grabe Anselmos, (c) Wenn über Berge sich der Nebel breitet. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, News. 7.10, Symphony No. 1 in C (Beethoven), by the Königsberg Opera House Orchestra, conducted by Erich Seidler. 7.45, Reading: Wenn die Apfel reif sind (Theodor Storm). 8.0, Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner: Overture, Waldchen (Kücken); Symphonic Poem, The Mid-day Witch (Dvorak); Bilder aus Osten (Schumann); Waltz, Etincelles (Waldteufel); March, Mit Eichenlaub, und Schwertern (Blon). 9.0, News. 9.20, German Dance Music.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. (up to 5.40 p.m.), and 20 kW. from 5.40 p.m.—11.40 a.m. to 3.40 p.m., Programme of the Algemeine Vereiningung Radio Omroep (A.V.R.O.). 11.40 a.m., Time Signal, 11.41, Concert of Light Music by Hans Schindler and his Orchestra, with Gramophone Interludes. 1.55 p.m., Gramophone Music. 2.10, Recitations. 2.40, Gramophone Music. 3.40 to 7.40, Programme of the Worker's Radio Society (V.A.R.A.). 3.40, Concert by the Little V.A.R.A. Orchestra conducted by Hugo de Groot: Gavotte (Lully); German Dances (Beethoven) Minuet, (Boccherini); Waltz, Die Schönbrunner (Lanner); Waltz, Frauenherz (Jos. Strauss); Trietrac (Waldteufel); Selection from La belle Héloïse (Offenbach). Gramophone Music: Muzurka (Ganne); Tango (Albeniz); Mexico (Alex); March (Ewais). 4.30, Programme for Children. 5.10, Concert by De Flerefontiers, conducted by van der Horst. 5.42, Song and Organ Recital by Cora de Lange-van Rijn and Johan Jong. 7.40 to 10.40, Programme of the Liberal Protestant Radio Society (V.P.R.O.). 7.40, Talk. 8.10, Violin and Pianoorte Re-

ital by Biloen and de Nobel. Violin Solo: Adagio from the Sonata in G Minor No. 1 (Bach); Sonata in B for Violin and Pianoorte (Mozart); Sonata in F, Op. 24 for Violin and Pianoorte (Beethoven). In the interval from 8.40 to 9.10, Talk. 9.40, Religious Report. 9.45, News. 9.55, Talk. 10.25, Gramophone Music. 10.40, Concert of Light Music: Zaragossa (de Gredos) Red Pepper (Lodge); Grüss mir mein Wien (Kálmán) Czardas from The Countess Maritza (Kálmán); Roses of Picardy (Wood); Il torero (Lucchesi); Du bist so wunderschön, Dolores (Valerio). Gramophone Music: Musical Whimsies (Ketelbey); Marechiarè (Tosti); Volga Boat Song from The Czarevitch (Lehár); Argentine Tango (Lucchesi) The Internationale (arr. Geyter). 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. (until 3.40 p.m.). Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—Programme of the Catholic Radio Society (K.R.O.).—11.55 a.m., Concert by the Vienna Station Octet: March, Freundschaft (Sousa); Waltz, Transaktionen (Strauss); Festouvertüre (Leutner); Minuet (Beethoven); Die Wut über den verlorenen Groschen (Beethoven); Italian Suite No. 1 (Bece); Selection from Die Fledermaus (Joh. Strauss); Gramophone Records; Waltz from The Rose of Stamboul (Fall); Aria from Samson and Delilah (Saint-Saëns); Spanish Dance (Schmelting); Viennese Operetta Potpourri (Robrecht); Finale. 1.25 to 1.40 p.m., Interval. 1.40, Gramophone Music. 2.10, Pianoorte Recital by Evert Ilaak. 3.10, Concert of Variety Music by the Vienna Station Octet. 4.10, Gramophone Music. 4.40, Concert by the K.R.O. Orchestra, conducted by Gerritsen: Airs de ballet (Rameau); Petite suite (Ducasse); La fille aux cheveux de lin (Debussy); Selection from Hérodiade (Massenet); Prelude to Die Lorelei (Bruch); Selection from Die toten Augen (d'Albert); In the Far West (Bantock); Concert Waltz (Glazunov); Extracts from Scènes napolitaines (Massenet). In the interval at 5.30, Talk: Safety Week. 6.40, Police Notes. 6.55, Geography Talk. 7.15, Gramophone Music. 7.40, The Seasons—Oratorio (Haydn) by the Sursum Corda Choir, The Rotterdam Philharmonic Orchestra and Soloists: Mlle. Sala (Soprano), Plooyer (Tenor), and van Duuren (Bass); Conductor: Van de Putten. In the intervals at 9.25 (approx.), News and Talk, and at 9.55, Gramophone Music. 10.25, News. 10.30, Gramophone Music. 10.40, Popular Music by the Vienna Station Octet. 11.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LAHTI**

167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—6.5 p.m., Concert by the Helsinki Municipal Orchestra, conducted by Dr. Helmut Thierfelder, relayed from the University, Helsinki: Overture, Der Freischütz (Weber); Symphony No. 7 (Sibelius); Symphonic brave (Graener); Les Préludes (Liszt). 7.45, News in Finnish. 8.0, News in Swedish.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—12.25 p.m., News and Weather. 12.35, Concert, from Stuttgart. 1.30, Two Talks: (a) Excursions in the Rhineland and Westphalia, (b) Photographic Hints. 1.50, Dance Music on Gramophone Records. 2.10, Reading in Dialect (Rüderscheidt). 2.30, Economic Notes. 2.50, Political Announcements. 3.0, See Leipzig. 5.35, English Lesson. 5.20, Talk on Genealogy. 5.35, Talk: Freiherr vom Stein and the Law of Property. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, See Frankfurt. 7.10, Concert from Stuttgart. 9.0, See Frankfurt. 9.20, See Stuttgart. 9.30, News and Weather. 9.45 till Close Down, See Frankfurt. 11.45 (approx.), Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—12.30 p.m., Violin and Pianoorte Recital by Hermann Lahl and Friedbert Sammler; Violin and Pianoorte: (a) Waltz (Brahms), (b) Spanish Dance (Manén); Pianoorte Solos: (a) Arioso and Brisesque (Windsperger), (b) Lustiges Stück (Reutter), (c) Allegro ritmico (Ilaas), (d) Dance (Scott); Violin and Pianoorte: (a) Moment musical (Rachmaninov), (b) The Old Castle (Missorgsky); Pianoorte Solos (Ebel): (a) Soldaten kommen, (b) Schlittenfahrt, (c) Slow Waltz; Violin and Pianoorte: (a) Lied (R. Strauss),

(b) Albumblatt (Reger), (c) Hopp-hopp (Schulhoff). 1.15, News. 1.30, Art Review. 1.40, Gramophone Music. 2.0, Economic Review of the Week. 2.15, Programme for the Country Woman. 2.35, Market Prices. 3.0, Concert by the Dresden Philharmonic Orchestra, conducted by Theodor Blumer: Prelude to Hansel and Gretel (Humperdinck); Two Movements from the Serenade in F (Klengel); Polovtsian Dances from Prince Igor (Borodin); Selection from A Masked Ball (Verdi); Symphonic Poem, Orpheus (Liszt); Waltz, Frühlingstimmen (Joh. Strauss); Hungarian Dances Nos. 2 and 7 (Brahms); Peer Gynt Suite No. 1 (Grieg); Overture, Fatinitza (Suppé). 4.50, Economic Notes, Weather and Time. 5.0, Review of Books—Education. 5.20, Talk: False Prophets and Marxists—Deceivers of the People. 5.50, To-day's News. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Czar and Carpenter—Comic Opera (Lortzing). In the interval at 9.0, News. 10.0, Concert by the Station Orchestra, conducted by Hilmar Weber; Soloist, Emil Luh (Violin): Faust Overture (Spohr); Violin Concerto in A Minor, No. 7 (Rode); Scandinavian Suite (Hamerick); Selection from Hansel and Gretel (Humperdinck); Piedmontese Dance in A (Sinigaglia); Selection from The Barber of Seville (Rossini). 11.30 (approx.), Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Sokol Lesson. 6.30, Sunday Trips. 7.0, Relay from Zagreb, 977 kc/s, 307 metres. 9.0, Time, News and Dance Music. 10.0 (approx.), Close Down.

**LUXEMBOURG**

325 kc/s, 1,191 metres; 200 kW. Dutch Programme.—7.0 p.m., Gramophone Records: Symphony No. 5 (Tchaikovsky), by the Amsterdam Concertgebouw Orchestra, conducted by Mengelberg. 7.55, Talk in Dutch. 8.10, Gramophone Records: Spanish Caprice (Rimsky-Korsakov); Suite, Iberia (Debussy). 8.50, News in French. 9.0, Song Recital by Venant Pauk: Goodbye; Vorrei morire (Tosti); Cavatina from A Masked Ball (Verdi); Song (Gretchaninov); Der Erlkönig (Schubert); Ungeduld (Schubert). 9.30, Overture, Cockaine (Elgar), on Gramophone Records. 9.45, News in German. 9.55, Gramophone Music. 10.15, Dance Music on Gramophone Records.

**LWOW**

788 kc/s, 381 metres; 16 kW.—5.45 p.m., Song Recital. 6.5, Announcements and Gramophone Music. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 10.5, Gramophone Music. 10.30 (approx.), Close Down.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.40 a.m., Radio Gazette for Lyons and the South-East. 8.20, Trio Concert: Soloist: Mme. Revellin Thiriet (Songs); Trio (Beethoven); Songs (Fauré): (a) Nocturne, (b) Les Présents; Adagio and Allegro (Haydn); Andante (Kocelin); Tango (Albeniz); Réverie and Serenade (Borodin); Songs: (a) Stances du mortel Sourire (Thiriet), (b) Three Airs from Ce monde de rosée (Delvincourt); Trio (Smetana). After the Concert, News.

**MADRID**

ARANJOE (EAQ), 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Concert of Popular Music. In the interval at 10.45, Radio Chronicle. 11.35, Answers to Correspondence. 11.40, Spanish-American Talk. 11.45, Light Music. 12 Midnight till Close Down, Programme in English by the I.B.C. I.B.C. Concert. The Brunette I Love; The Love Lieutenant; The Skaters; Aloha Oe!; Smile, darn yer, Smile; Butterflies in the Rain; Bananas; The Old Blind Man. 12.30 a.m. (Saturday), I.B.C. Good-night Melody.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes. Exchange and Request Gramophone Music. 8.15, Topical Review. 8.30, Interval. 9.30, Chimes, Time, Topical Review. 9.40 (approx.). Tosca—Opera (Puccini), on Gramophone Records—Concert Version. 11.45, Topical Review. 12 Midnight, Chimes and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Plichta. 3.55, See Prague. 5.5, Tourist Report. 5.15 to 9.45, See Prague. 9.45 (approx.), Close Down.

**MOSCOW**

TRADES UNIDN, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather. 1.45 p.m., Weather Report. 2.0, Extracts from Figaro

—Opera (Mozart). 3.0, Reading from Works on Marxism and Leninism. 3.30, Dramatic Items, followed by Reading from the Poems of Bezymensky and Maiakovsky. 4.30, Concert for Young People. 5.30, Borodin and Ippolitov-Ivanov Concert. 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Orchestral Concert, conducted by Erich Kloss: Overture, Im Hochland (Gade); Rhapsody (Kallenberg); Selection from Mona Lisa (Schillings); Karneval - Miniaturen (Kaskel); Mephistos Spiel (Deyer); Eine kleine Liebeleli (Lautenschläger); Ungarischer Schäferfanz (Gungl). In an interval at 4.0, Radio Report on Military Manœuvres. 4.45, Talk for the Younger Generation. 5.5, Sonata in D minor, Op. 121 (Schumann), for Violin and Pianoorte (Schumann), by Isabella Schmitz (Violin) and Richard Staab (Pianoorte). 5.25, Talk: Eastern Bavaria. 5.45, Time and Announcements. 6.0, Transmission for all German Stations: Three Centuries of Military Marches (arr. Paul Winter) by a Military Band, conducted by Georg Fürst. 7.0, Kimmst auf d'Nacht—Programme in Dialect. 7.45, Political Address. 8.5 (from Nürnberg), Symphony Concert; conductor, Willy Böhm; Soloist, Henry Marteau (Violin); Symphony in C (Wagner); Violin Concerto (Siegfried Wagner). 9.0, Time and News.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Orchestral Concert, relayed from the Theatre Café; Soloist, Nielsen (Violin); Tartar March (Hurum); Valse caprice (Nordraak); Norwegian Rhapsody No. 1 (Svendson); Canonetta for Violin (Kleven); Spring (Kristoffersen); Snow (Lie); Violin Solo, Norwegian Dance (Lange); Berceuse (Winge); March (Grieg). 5.0, French Lesson. 5.30, Talk. 6.0, Announcements, Weather and News. 6.30, English Lesson. 7.0, Time Signal. 7.1, Concert of Sacred Music, relayed from a Church. 7.45, Talk. 8.0, Concert by the Radio Ensemble, relayed from Bergen, 824 kc/s, 364 metres. 8.40, Foreign Market Report, Weather and News. 9.0, Topical Talk. 9.15, Literary Review. 9.45 (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

568 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Notes, Tourist Talk, Agricultural Report, Report of the Royal Geographical Society, and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Concert of Opera Music. In the intervals, Talks and Notes. 10.0, News.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Prelude and Variations (Bach) on Gramophone Records. 7.5, Talk. 7.15, Le Journal Paris. 7.30, Gramophone Music: Charles Pauzeia: (a) Der Nussbaum (Schumann), (b) L'invitation au voyage (Duparc) (c) Erlkönig (Schubert); Elizabeth Schumann: (a) Freundliche Vision (R. Strauss), (b) Ständchen (R. Strauss), (c) Die Post (Schubert), (d) Wohin (Schubert). 7.50, Talk. 7.55, Agricultural Report. 8.30, Le nouveau Seigneur du village—Opéra-Comique in One Act (Boieldieu), followed by Le Testament de Monsieur de Crac—Opéra-bouffe in One Act (Lecocq). 10.30, News.

**PARIS**

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m., Weather and Physical Culture. 7.45, Gramophone Records: My Rose (Fillis); Isolida (Douce); Seguidillas and Tango (Bautista); Selection from Der Trompeter von Säckingen (Nessler). 8.0, Weather and Press Review. 12 Noon, Programme of Jewish Literature and Music. 12.30 p.m., Gramophone Concert: Ballet Music from the Cid (Massenet); Sicilienne from Cavalleria rusticana (Mascagni); Maundy Thursdays in Seville (Turina); Sonata in E (Sclaratti); Waltz in A (Brahms); Der Erlkönig (Schubert); Gretchen am Spinnrad (Schubert); Barcarolle from The Tales of Hoffmann (Offenbach); Valse romantique (Chabrier); Melody from Mirella (Gounod); Serenade (Saint-Saëns); Nocturne from a String Quartet (Borodin); Duet from Romeo and Juliet (Gounod); Trio in G minor (Haydn); Hungarian Rhapsody (Liszt); The Dreary Steppe (Gretchaninov); Etude No. 3 (Chopin); Quintet (Rameau); Piece in C sharp minor (Boulanger); Trio (Poulenc). In the interval at 1.0, Exchange, News and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.50, Insurance

OCT. 30th **FRIDAY** continued

Societies' Report. 7.0, Talk by Edmond Faloux: The Modern French Novel. 7.20, Parodies and Pastiches—Gramophone Concert: Pianoforte Solo: From Mozart to Hindemith (Lederer); Rhythmic Paraphrase on Verdi's Il Trovatore (Lange); Pianoforte Solo: Impressions of Famous Composers; Pianoforte Quartet: Waltz from Faust (Gounod); Pastiches musicaux (Bétove); Chopinista (Doucet); Wagneria (Doucet); Souvenirs de Bayreuth—Fantasia in Quadrille Form on Themes of Wagner (Fauré-Messager). 7.45, Commercial Prices and News. 8.0, Reading. 8.30, News and Weather. 8.40, Gastronomic Review. 8.45, Madame Butterfly—Opera (Puccini), on Gramophone Records, by the Cast of the Scala, Milan. In the interval at 9.15, Press Review and News.

**PITTSBURGH**

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.86 metres and 25.27 metres.—7.30 p.m., KDKA Home Forum. 8.0, Programme to be announced. 8.15 to 9.30, New York Relay. 8.15, Utility Hall. 8.30, Words and Music. 8.45, The Morin Sisters. 9.0, Betty and Bob. 9.15, Gene Quaw's Orchestra. 9.30, News and Markets. 9.45, The Arcadians, from New York. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, Press News Reeler. 11.15, Sports, Pat Haley. 11.30, Pittsburgh Spotlights. 11.45, Lowell Thomas, from New York. 12 Midnight, Amos 'n' Andy from New York. 12.15 a.m. (Saturday), Silvertoppers. 12.30 to 3.30, New York Relay. 12.30, Circus Days. 12.45, String Symphony. 1.0, Popular Programme. 1.30, Potash and Perlmutter. 1.45, Red Daisies. 2.0, Let's Listen to Harris. 2.30, Popular Programme. 3.0, First Nighter. 3.30, Samuel Di Primo (Tenor).

PORSGRUND.—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres, 120 kW.—3.0 p.m., See Moravská-Ostrava. 3.55, Talk: The Motor Industry and the Crisis. 4.5, Concert by the Prague String Quartet. Quartet in C, No. 19 (Mozart); Quartet in G, Op. 106 (Dvořák). 5.5, Agricultural Prices. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Talk on Modern Road Building. 6.0, Time and News. 6.5, English Conversation. 6.20, Introductory Talk to the following transmission. 6.30, The Lantern—Opera (Novak), relayed from the State Opera House. In the intervals at 8.0 and 9.0, Time Signal. 9.15, News, Review of the Day and Sports Notes. 9.30, Talk in Russian. 9.45 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne). Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Geneva), Gramophone Concert. In an interval at 12 Noon, Financial Notes. 1.0 p.m., Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0 (from Zurich), Concert. 5.0 (from Geneva), Programme for Women. 5.30 (from Geneva), Esperanto Lesson. 5.40 (from Geneva), English Lesson. 6.5 (from Geneva), Talk for Bridge Players. 6.20 (from Geneva), Talk on Chess. 6.35 (from Geneva), Talk. 6.59 (from Geneva), Weather Report. 7.0 (from Geneva), Trio Concert of Modern Music: Sonata for Pianoforte (Durey); Trio (Martini). 7.35 (from Geneva), Recital of Modern Poetry, by Paul Baroz. 7.50 (from Geneva), Synopses for Two Pianofortes. 8.10 (from Geneva), Review of the Week. 8.25 (from Geneva), Concert by the Landwehr, conducted by Hoogstede. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

**REYKJAVIK**

250 kc/s, 1,200 metres; 21 kW.—11.0 a.m., Weather Forecast. 1.15 p.m., Variety Programme. 4.0, Weather Forecast. 8.10, Weather Forecast. 8.20, Light Music and Announcements. 9.0, Light Music. 9.30, Talk. 10.0, Time and News. 10.30, Quartet in B flat (Brahms), played by the Léner String Quartet (on Gramophone Records).

**RIGA**

572 kc/s, 525 metres; 15 kW.—6.5 p.m., Concert by the Radio Orchestra and the Opera House Orchestra, conducted by Teodor Reiters, relayed from the Opera House. Soloist: Nicolas Orlov (Pianoforte). Symphony No. 3 in C (Scriabin); Pianoforte Concerto in F Sharp Minor (Scriabin); Pianoforte Concerto No. 2 in F Minor (Chopin). In the intervals at 6.50, News and at 7.30, News. 8.5, Weather and News. 8.15, Light Music on Gramophone Records.

RJUKAN.—See Oslo.

**ROME**

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres, from 7.15 p.m. (approx.); and 2RO, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—11.30 a.m., Gramophone Music. 12 Noon, Orchestral Concert of Light Music. In the interval from 12.30 to 12.45, Giornale Radio and Exchange.

1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.15 to 5.0, Vocal and Instrumental Concert; Luigi Chiarappa (Cello), Enrichetta Petacci (Pianoforte), Giuseppina Marciano (Soprano), Clara Fioraventi-Cinci (Mezzo-Soprano), and Mario Cavagnis (Tenor): Andante non troppo and Allegro vivo from the Sonata for Cello and Pianoforte, Op. 6 (Richard Strauss); Soprano and Mezzo-Soprano Duets: (a) Song for two Voices (Bellini); (b) Anima mia (da gagliano); Tenor Solos: (a) Serenade (Belochi); (b) Aria from André Chénier (Giordano); (c) Aria from Manon Lescaut (Puccini); Soprano and Mezzo-Soprano Duets: (a) Folk Song for two Voices, Voglio farti una corona (Bianchini); (b) Duet from Hansel and Gretel (Humperdinck). 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopolavoro and Tourist Report. 5.57, Report of the International Institute of Agriculture (in Spanish, German, and French). 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time, Announcements, and Sports Notes. 7.15, Sponsored Concert. 8.15, Talk: A Journey in Alaska in a temperature Sixty degrees below zero. 8.30, Police Band Concert, conducted by Marchesini: Overture, Il Guarany (Gomez); Three Songs without Words (Mendelssohn): (a) Spring Song, (b) Spinning Song, (c) The Hunt; Selection from Ero e Leandro (Mancini); Humorous Talk; Overture, The Thieving Magpie (Rossini); Serenata abruzzese (de Nardis); Scherzo from L'apprenti sorcier (Dukas); Trumpet Solo, Der Liebespostillon (Neumann); March, Urbs (Marchesini). 10.0, Giornale Radio.

SALZBURG.—See Vienna.

**SCHENECTADY**

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—7.30 to 8.30 p.m., New York Relay. 7.30, The Romanets. 7.45, Three Shades of Blue. 8.0, Sonata Recital. 8.15, Soloist. 12.45 a.m. (Saturday), Stock Reports. 1.0, Popular Concert, from New York. 1.30, Popular Programme. 2.0 to 4.0, New York Relay. 2.0, Popular Programme. 2.30, Dramatic Programme. 3.0, First Nighters. 3.30, Lum and Abner's Friday Night Sociable. 4.0, Programme Résumé.

**SCHWEIZERISCHER LANDESENDER**

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne), Gymnastics. 11.0 (from Basle), Cinema Organ Recital on Gramophone Records. 11.29, Time Signal from Neuchâtel Observatory. Weather and News. 11.40 (from Basle), Extracts from Musical Plays. Operettas and Sound Films, on Gramophone Records. 12.25 p.m. (from Basle), Time, Weather and Exchange. 12.30 (approx.), to 2.30, Interval. 2.30 (from Zurich), Programme for Women. 3.0 (from Zurich), Concert by the Radio Orchestra. 4.0, Gramophone Music. 4.10, Concert by the Small Radio Orchestra, conducted by Scherbaum. 5.0 (from Zurich), Gramophone Music. 5.30 (from Berne), A Dialogue: The Training of Young Farmers. 6.0, (from Berne), Time, Weather, Market Prices, Tourist Talk and Sports Notes. 6.20 (from Berne), Talk: Witchcraft. 6.50 (from Berne), Introductory Talk to the following Transmission. 7.0 I quattro rusteghi—Opera in Three Acts (Wolff-Ferrari). In the interval at 8.0 (approx.), Weather and News. 9.30 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Ostersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—12 Noon, Broadcast for Schools. 4.5 p.m., Programme for Children. 4.35, Guitar Music, relayed from Karlstad, 1,382 kc/s, 217 metres. 4.45, Dialogue. 5.0, Gramophone Music. 5.55, Talk on Foreign Politics. 6.30, Talk relayed from Malmö, 1,301 kc/s, 231 metres. 7.0, Orchestral Concert, conducted by Adolf Wiklund; Soloist, Simon Goldberg (Violin): Overture, Romeo and Juliet (Tchaikovsky); Violin Concerto No. 4 in D (Mozart); Pastorale d'été (Honegger); Marche and Gavotte from the Serenade for Small Orchestra (Casella); Poem for Violin and Orchestra (Chausson). 8.15, Talk: Weather. 9.0, Concert: Piece (arr. Söderström); Songs: (a) Anne Marie (Körling), (b) Love's old sweet Song (Molloy), (c) Mattinata (Leoneavallo); Reading; Tarantelle for Flute and Clarinet (Saint-Saëns); Songs: (a) Before you came (Temple King), (b) L'amour, toujours l'amour (Friml); Three Pieces for Quartet. 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Music. Symphony in B (Beethoven); Siegfried Idyll (Wagner); Prelude to Tristan and Isolde (Wagner); Concerto in E flat (Liszt). 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Light Music on Gramophone Records. 2.0, Interval. 4.45, Literary Talk. 5.0, Orchestral Concert, conducted by Roskam. Wien bleibt Wien (Schranniel-Michaelov); Waltz (Fryberg); Plaisir d'amour (Martini); Tango (Michaelov); Foxtrot (Fried and Lombardo); Offenbach Potpourri (Conradi); Foxtrot, My darling (Myers); Brother can you spare a dime? (Conroy); Cello Solo; Réve d'une jeune fille (Vaulet); Waltz, Cuban Love Song (McLingh); Rambling down the Roadway (O'Hagen and Dundas); Spanish March, Merida (Giuliani). 6.0, Trio Concert relayed from Lille, 1,130 kc/s, 265.4 metres. 7.0, Topical Talk in German. 7.15, Talk: The Wines of Alsace. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Songs from Schéhérazade by Mme. Inés Maucian (Soprano) with Commentary. Three Songs (Lazzari): (a) Demande, (b) Chanson des deux amants, (c) Le passé; Three Songs (Paul Piéne): (a) Berceuse, (b) Une Rose s'effeuille au verger, (c) Les nues; Three Songs (Ravel): (a) Asie, (b) La flute enchantée, (c) L'Indifférent. 9.30 (approx.), Press Review. 9.35 (approx.), Overture to Act I of Tannhäuser—Opera (Wagner) by the Station Orchestra, conducted by Maurice de Villers. Soloists: Faniard (Tenor) and Mlle. Genya Marat. 10.30 (approx.), Close Down.

**STUTTGART**

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.35 p.m., Gramophone Concert. 1.30, Interval. 1.55 (from Mannheim), Suggestions for Sunday Excursions. 2.10, German Chamber Music: Variations for Clarinet and Pianoforte (Weber); Trio No. 4 in B Flat, Op. 11, for Clarinet, Cello and Pianoforte (Beethoven). 2.40, Programme for Children. 3.0, See Leipzig. 4.50, Interval. 5.0 to 5.35, See Langenberg. 5.35, Legal Talk. 5.50, Time and Announcements. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, See Frankfurt. 7.10, Concert by the Württemberg Symphony Orchestra, conducted by Ferdinand Drost, relayed from Heilbronn; Soloists: Adelhild Arnoldh (Soprano), Heinrich Reikemper (Baritone) and Hermann Huhl (Violin); Symphony in C—the Jupiter (Mozart); Soprano Aria with Violin Obligato from Il re pastore (Mozart); Two Arias from Figaro (Mozart): Overture, Oberon (Weber); Arias from (a) Hans Heiling (Marschner), (b) Der Freischütz (Weber), (c) A Masked Ball (Verdi); Invitation to the Dance (Weber). 9.0, See Frankfurt. 9.20, Talk: Things you should know. 9.30, News. 9.45 (from Karlsruhe), Dramatic Programme. 10.0 till Close Down. See Frankfurt 11.45 (approx.), Close Down.

SUNDSVALL.—See Stockholm.

**TOULOUSE**

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Music by an Argentine Orchestra. 6.30, Military Music. 6.45, Popular Songs. 7.0, Medical Talk. 7.10, Orchestral Piece: La Valse (Ravel). 7.15, News. 7.30, Accordion Music. 7.45, Operetta Airs. 8.0, Orchestral Concert: Lehar Potpourri (Hrubý); Selection from La princesse jaune (Saint-Saëns); Egyptian Serenade, Anima (Lincke); Ronde villageoise (Chabrier); Minuet in G (Paderewsky); Selection from The Desert Song (Romberg). 8.30, Russian Songs and Balalaika Music. 8.45, Orchestral Pieces. 9.0, Opera and Opéra-Comique Music: Triumphal March from Aida (Verdi); Calunny Aria from The Barber of Seville (Rossini); Aria from William Tell (Delibes); Le réve from Manon (Massenet); Connais-tu le pays from Mignon (Thomas); Prologue to I Pagliacci (Leoneavallo); Aria from Romeo and Juliet (Gounod); Softly Awakes my Heart from Samson and Delilah (Saint-Saëns); The Miserere Duet from Il Trovatore (Verdi). 9.45, Music by a Viennese Orchestra. 10.0, Light Music. 10.15, North African News. 10.30, Concert for Listeners in Morocco. 11.0, Dance Music. 11.45, Popular Songs. 12 Midnight, News. 12.5 a.m. (Saturday), Opéra-Comique Music: Selection from The Daughter of the Regiment (Donizetti); Overture, The Barber of Seville (Rossini). 12.15, Military Music. 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m., Chamber Music. Roberto Repini-Zoccon (Cello) and Antonio Margelia (Bass). Sonata in A Minor (Marcello); Bass Solos: (a) The Prisoner (Greechaninov), (b) The Two Grenadiers (Schumann); (c) Cello Solos: (a) Elegy (Repini-Zoccon), (b) Minuet (Rameau); Bass Solos: (a) Song from Lakin (Delibes),

(b) Aria from Hérodiade (Massenet). 5.0 till Close Down, See Turin.  
TRONDHEIM.—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genova, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Concert of Russian Chamber Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolavoro Announcements and Gramophone Music. 6.0, Time, Report of the Royal Geographical Society and Gramophone Music. 6.10, Agricultural Notes and Wheat Market Reports. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio and Weather. 7.15, Sponsored Music. 7.30, Symphony Music (on Gramophone Records). In the interval: Talk. 9.0, Popular Orchestral Concert, conducted by Tito Petralia. 10.0, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.24 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—11.0 to 11.15 a.m., Religious Information in German. 8.0 to 8.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 216.5 metres.—10.30 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer. In an interval at 10.55, Wcather. 12 Noon, Time and Announcements. 12.10 p.m., Gramophone Concert: Aria from Mignon (Thomas); Hungarian Rhapsody No. 12 (Liszt); Berceuse from Jocelyn (Godard); Aria from Madame Butterfly (Puccini); Death of Othello, from Othello (Verdi); Aria from The Twilight of the Gods (Wagner); Aria from Eugen Onegin (Tchaikovsky); Grave (Bach-Kreiser). 1.0, Interval. 2.0, Time, Weather, and Exchange. 2.20, Gardening Talk. 2.40, Programme for Children. 3.5, Gramophone Concert of Music from Sound Films. 3.30, Programme for Women. 3.55, Talk: Occupations in Old Vienna. 4.20, Sonata in A, Op. 47—The Kreutzer (Beethoven) for Violin and Pianoforte, by Sigmund Feuermaun and Otto Schullhof. 4.55, Tourist Report. 5.10, Talk for Women. 5.25, Sports Notes. 5.35, Talk: Art at the Court of the Kings of Benin. 6.0, Concert of Popular Overtures by the Wiener Symphoniker, conducted by Karl Auerlieth: The Merry Vices of Windoor (Niçolat); Si j'étais roi (Adam); Mignon (Thomas); William Tell (Rossini); Der Freischütz (Weber); The Mastersingers (Wagner). In an interval at 6.40, Time and Announcements. 7.5, The Divine Faustina—Play in Eight Scenes (Edmond de Goncourt). 9.0, Announcements. 9.15, Gramophone Concert: Overture, Das Nachtlager von Granada (Kreutzer); Potpourri of German Folk Songs: Paraphrase on the Song, You are my Heart's Delight (Lehar); Waltz from The Flower of Hawaii (Abrahms); Strauss Potpourri (Weber); Old Vienna in Song and Dance (Pachernegg); Foxtrot from White Horse Inn (Stolz-Benatzky); Canzonetta, Tie-Tie, Tie-Ta (Lama); Tango, Mir scheint, du hast gewinkt (Rosen); Burlesque on Two Bulgarian National Melodies. After the Concert, Announcements.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.55 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Quintet Concert. 12 Noon, Interval. 2.30, Economic Notes. 2.40, News. 2.45, Review for Boy Scouts. 2.50, Maritime and Colonial Notes. 2.55, Gramophone Music. 3.40, Review of Publications. 3.55, Song and Pianoforte Recital by Zamorska and Staniewicz. Pianoforte Solos: (a) Fantasia in D minor (Mozart), (b) Danse lente (Frank), (c) Fantasia Impromptu (Chopin) Arias from (a) The Queen of Spades (Tchaikovsky), (b) Hérodiade (Massenet), (c) Zaza (Leoneavallo), (d) Iris (Mascagni); Pianoforte Solos: (a) Le désir (Chopin-Liszt), (b) March from Love for the Three Oranges (Prokofiev), (d) Prelude (Prokofiev), (e) Fire Dance (Fallas); Songs: (a) A Tale (Rozycki), (b) The Swan (Szymanowski). 4.50, Agricultural Talk. 5.0, Talk, relayed from Wilno, 533 kc/s, 563 metres. 5.20, Light Music from the Gastro-nomia Restaurant. 6.5, Miscellaneous Items. 6.20, Talk: Excursions for Holidays. 6.25, Topical Talk. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Talk on Music. 7.15, Concert by the Philharmonic Orchestra, conducted by Bierdajen. Soloist: Milstein (Violin). Leonora Overture No. 3 (Beethoven); Violin Concerto in D, Op. 61 (Beethoven); Symphony No. 2 (Scriabin); Violin Solos with Pianoforte Accompaniment. In the interval at 8.0, Reading. 9.40, Sports Notes. 9.50, Dance Music from the Russia Café. In the interval at 10.0, Weather and Police Notes.

**WILNO**

533 kc/s, 563 metres; 16 kW.—6.5 p.m., Topical Talk. 6.20, Miscellaneous Items. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45 till Close Down, See Warsaw.

ZURICH.—See Schweizerischer Landessender.

## ALGIERS

824 kc/s, 364 metres; 13 kW.—7.20 p.m., Songs from Sound Films. 7.55, News. 8.0, Time Signal and Lottery Results. 8.10, Concert by the Station Orchestra. 8.40, News. 8.45, Gramophone Music. 8.55, Concert (contd.). 9.30, News. 9.35, Accordion Music. 9.55, News.

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Report and Gramophone Concert. 2.30, Results of the Draw of Hospitals Trust Sweep on the Cambridgeshire. 6.0, Gramophone Music. 6.45, News. 7.0, Aida—Opera in four Acts (Verdi). 9.30 to 10.30, Programme by the I.B.C. (Ireland) Ltd. 9.30, Orchestral Music. Polonaise in A (Chopin); Violin Solo: Hungarian Dance (Brahms); Wireless World Announcement; Invitation to the Waltz (Weber); In the Hall of the Mountain King (Greig). 9.45, Concert of Dance Music. I can't remember (Berlin); Dancing Butterfly (Pelke); The Shadow Waltz (Dubin); Sunny Madeira (Gilbert). 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd.: What have we got to lose? (Kent); Shuffle off to Buffalo (Dubin); Jog Along (Arnold); Racing Commentary; In the Park in Pavee (Rainer); Pink Elephants (Woods); Home-made Heaven (Rainer); Waltzing in a Dream (Young). 10.30, I.B.C. Good-night Melody followed by News and Weather. 10.40, Traditional Music. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1, 850 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Concert by the Station Trio. Polonaise in B Flat (Schubert); Serenade (Sanderson); Bells across the Meadows (Kettelbey); Minuet from the Divertissement in D (Mozart); Selection from Rigoletto (Verdi); Intermezzo (Malvezzi); Selection from Madame Butterfly (Puccini). 7.0, Request Programme. 7.30, Exchange and Request Programme (contd.). 8.0, Gramophone Music. 8.15, Anti-War Talk, followed by Request Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather and Exchange. 9.5, Concert by the Station Orchestra. Marcha del progreso (Fenhaes); Selection from Ruy Blas (Acevedo); Waltz (E. Strauss); Canzona napolitana (d'Ambrósio); Waltz (Ravel); Novelletta (Claudi); Pizzicato-Caprice (Hienley); Overture, Semiramide (Rossini). 10.30, Selection from an Opera on Gramophone Records. In the interval at 11.0, News. 12 Midnight (approx.), Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—11.30 a.m., Concert by the Radio Quintet. 12 Noon to 3.30 p.m., See Rome. 3.30, Programme for Children. 3.55 (approx.) to 5.0, See Rome. 5.35, News in Albanian. 5.45 to 8.0, See Rome. 8.0, See Turin. 10.0, Giornale Radio from Rome.

BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—6.30 p.m., Folk Song Recital. 7.0, Concert by the Radio Orchestra. 8.0, The Barber of Seville—Opera (Rossini) on Gramophone Records. In the interval at 9.0, Time and News. After the Opera, Dance Music from the Auto Club.

## BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—1.0 p.m., Dance Music on Gramophone Records. 2.0, Handwork Lesson for Children. 2.30, Weather and Exchange. 2.45, Reading from Das kaiserbuch (Paul Ernst). 3.0, See Hamburg. 4.0, Sports Review. 4.20, Künneke and Will Fanta Operetta Music—Recital by Else Kochmann (Soprano) and Bernhard Bötzel (Tenor). 5.0, Poems. 5.5, Radio Report: The Tugs and Small Boats on German Rivers. 5.30, Topical Talk. 5.45, Weather and News. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, Today's Motto. 7.5, Variety Programme in Aid of the Winter Relief Fund. 9.0, News. 9.5 (approx.), Farewell to the Water—Radio Picture (Gustav Schäfer), on Gramophone Records. 9.45, Weather. 10.0, See Langenberg. 11.0 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—3.0 p.m., Concert by the Alfred Brox Orchestra, relayed from the Zoological Gardens. Melody (Michele); Karneval-Suite (Siede); Liebesserenade (Löhner); Karussell (Kiek-Schmidt); Morning, from Peer Gynt (Grieg); Waltz, Lied der Nacht (Kark); Violin Solo: Romance (Svendens); Intermezzo. Ein Kuss von Dir (Ailbouth); Manchurian Sketches (Glan); Strauss Potpourri (Weber). In an interval at 4.0 (approx.), Talk: Swimming in Winter. 4.35, Weekly Sound News Report. 4.55, Das Hexenlied, Op. 15 (von Schillings), by the Berlin Philharmonic Orchestra, conducted by the Composer (on Gramophone Records). 5.20, Walks in Berlin—An Expedition to the Grünewald. 5.30, The Funkstunde informs its Listeners. . . . 5.45, Topical Talk. 6.0,

Transmission for all German Stations, relayed from Heilsberg. 7.5, Bunter Abend. In the interval at 9.0 (approx.), News, and at 10.0 (approx.), Topical Talk. 12 Midnight (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BERMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—7.0 p.m., Radio Journal. 7.55, Sports Talk. 8.0, News, Racing Results and Market Prices. 8.5, English Lesson. 8.20, News. 8.30, Gramophone Concert. 9.0, Two Comedies: (a) La fille bien gardée (Labiche and Marc Michel), (b) Le guillotine par persuasion (Eugene Chavette).

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—6.0 p.m., See Prague. 9.15, See Brno. 10.30 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.45 p.m., News. 1.10, Film Review. 1.25, Book Review. 1.45, Talk: The Pleasures of Art. 2.0, Concert. 4.30, Reading (Max Mell). 5.0, Programme Announcements for the Coming Week. 5.10, Programme to be announced. 5.40, Reading of Unfamiliar Ribezahl Legends. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, News. 7.10, Concert of Scandinavian Music by the Silesian Symphony Orchestra, conducted by Rischka; Soloist: Bruno Jagielski (Tenor); Overture, Hamlet (Gade); Three Tenor Solos (Grieg-Rischka): (a) Sommerabend, (b) Am Strom, (c) Ein Schwan; Suite No. 5, Baroque (Atterberg); Tenor Solos (Grieg-Rischka): (a) Auf der Reise zur Heimat, (b) Die Prinzessin, (c) Die Johannisnacht; Minuet from the Sonata No. 7 (Grieg); Three Tenor Solos (Grieg-Rischka): (a) Letzter Frühling, (b) Lichte Nacht, (c) An das Vaterland; Suite from the Music to King Christian II (Sibellius). 9.0, News. 9.25, Dance Music relayed from Bad Altheide. 11.30 (approx.), Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission: News followed by Slovak, German and Hungarian Folk Songs for Violin and Harpsichord. 6.0, See Prague. 9.15, Concert of Light Music by the Station Orchestra, conducted by Gotthard. 10.30 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Radio Orchestra, conducted by Walpot. Soloist: Mme. Armande Bank (Songs). Humorous Ballet Suite (Bianchini); Waltz, Wine, Women and Song (Joh. Strauss); Songs with Orchestral accompaniment. Largo religieux (Armand Crabbé); En sourdine (Crabbé); Violin Solo: Sérénade gracieuse (Collin); Extracts from La Féria (Lacôme). 5.0, Concert by the Station Symphony Orchestra, conducted by Meulemans. Divertissement on Popular Transylvanian Themes (Samuel); Cello and Orchestra: Berceuse (Absil); En forme de menuet (Jongen); Oboe and Pianoforte Concerto (Robert); Almería (Mahy); Meditation (Rasse); Waltz from the Ballet, Hoopjes et Hoopjes (Lauweryns); Menuet de printemps (Desprez); Kermesse en Brabant (Sarly). 6.0, Talk: Chartered Accountancy. 6.15, Gramophone Music. 6.30, Chopin Pianoforte Music. Fantasia, Op. 49 Polonaise, Op. 71, No. 2. 6.45, Gramophone Music. Norwegian Dances (Grieg); Ballet Music from Isoline (Messenger). 7.15, Recital of the Music of Abel Nathan. 7.30, Le Journal Parlé. 8.0, Chamber Music by the Liège Quartet. Quartet No. 15 (Mozart); Quartet, Op. 41, No. 1 (Schumann). 8.45, Scenes from Molière's Plays, with Commentary: Tartuffe, L'Avare, Le Malade imaginaire, and Le dépit amoureux. 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—12 Noon, Concert by the Radio Orchestra, conducted by Walpot. Soloist: Armande Bank (Songs); March of the Marionettes (Hullebroeck); Waltz from Faust (Gounod); Overture, Czar and Carpenter (Lortzing); Retite caline (Gillet); Lontanetta (Razigade); Italian Songs: Hungarian Rhapsody, No. 2 (Liszt); Vibraphone Solo: Tango, Wenn es Bestimmung ist (Ro-

land); Extracts from the Esquisses flamandes (Brusselmans). 1.0 p.m., Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans. Overture, Maritana (Wallace); Liebestraum (Liszt); Serenade, Granada (Albeniz); Selection from La Traviata (Verdi); Nocturne for Violin (Chopin-Sarasate); Ballet Music from Faust (Gounod); Kiss Waltz (Burke); Foxtrot, Fascinat' Vamp (Nussbaum). 4.45, Reading. 5.0, Concert by the Radio Orchestra, conducted by Walpot. Motor March (Rosey); Overture, Fra Diavolo (Auber); Waltz from Moulins qui chient (Van Oost); Selection from Carmen (Bizet); La voix des cloches (Luigini); Gracious Dolly (Macker); Rumba (Crabbé); Ballet Music from The Queen of Sheba (Gounod). 6.0, Gramophone Music. Sonata in A (Mozart-Tertis); Toccata from the Fifth Symphony (Widor). 6.15, Readings with Commentary. 6.30, Concert by the Small Station Orchestra conducted by Leemans. Carmen Festival (Gillon); Paysage flamand (De Teyse); Aubade à Kiki (De Boeck); Ballet Music from Henry VII (Saint-Saëns); Impromptu for Pianoforte (Brenta); Hornpipe (O'Neill); Selection from Piccolino (Guiraud); Ballet Suite (Popy). 7.15, Talk: Artistic Tendencies in Children. 7.30, Agricultural Review. 8.0, Francesca—Opera in Five Acts (De Boeck), relayed from the Royal Opera House, Antwerp. In the intervals at 8.34 and 9.13, Humorous Items, and at 10.0 and 10.20, Gramophone Music. 10.48 (approx.), Close Down.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Jazz Music. 5.0, Radio Journal. 6.15, Jazz Music (contd.). 6.0, Educational Programme. 6.20, Song Recital. 6.40, Talk. 7.0, Russian Song Recital by Xenov. 7.20, Choral Music relayed from the Silvestre Church. 8.0, Talk. 8.15, Pianoforte Recital of Jazz Music by Sibiceano. 8.45, Radio Journal. 9.0, Light Music, relayed from a Restaurant.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Programme also relayed on 840 metres.—4.30 p.m., Concert by the Concert Orchestra, conducted by Viktor Vaszy. 5.45, Programme for Workers. 6.15, Concert by the Municipal Choir. 7.0, Anna Bal—Operetta in Three Acts (Martos and Vincze). Conductor: Vincze. 9.15, News. 9.30 (approx.), Gramophone Concert.

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time and Chimes from the Town Hall. 11.2, Concert by the Bendix String Ensemble, relayed from the Wivex Restaurant. 1.0 p.m., Interval. 2.0, Gramophone Concert. 2.30, Concert by the Radio Orchestra, conducted by Emil Reesen. Soloist: Lis Jacobsen (Songs). Concert Overture, Ruy Blas (Mendelssohn); Prelude (Jørgensen); Salut de printemps (Jørgensen); Selection from The Barber of Seville (Rossini); Romanian Waltz, Sylva (Spæck); Five Songs with Pianoforte Accompaniment (Lange-Müller); Overture, The Bohemian Girl (Balie); Ballet Music from La belle Hélène (Offenbach); Three Pieces (Dvorak): (a) Waltz in A, (b) Humoresque, (c) Slav Dance in C; Battle March (Möller). 4.30, Exchange and Fish Market Prices. 4.45, Talk. 5.15, French Lesson. 5.45, Weather. 5.54, Announcements. 6.0, News. 6.15, Time Signal. 6.30, The History of Music—The Transition of the Viennese Masters. 7.0, Talk by Knud Jeppesen and Concert by the Radio Orchestra, conducted by Launy Grøndahl. Soloist: Folmer Jensen (Harpsichord). Sinfonia (Wagebseil); Harpsichord Concerto in E Flat (J. C. Bach); Sinfonia (Stamitz). In the interval at 7.0, Chimes from the Town Hall. 7.40, A visit with the Microphone to a Sugar Factory. 8.10, Dance Music by the Vilfred Kjaers Rhythm Orchestra, the Rhythm Girls, a Quartet and Soloists. Orchestra: (a) Selection from Forty Second Street (Dublin and Warren), (b) I cover the Waterfront (Green and Heymann), (c) Something came and got me in the Spring (Scholl, Schwartz and Rich); Rhythm Girls: Selection from the Jazz Oratorio (Christensen); Trumpet Solos: (a) Minnie the Moocher (b) Blues, (c) Stomp; Orchestral Foxtrot, Shuffle off to Buffalo (Dubin and Warren); Quartet: (a) Four String Joe (Venuti), (b) Egen Komposition, (c) Ducky Wucky (Ellington); Songs: (a) Creole Love Call (Ellington), (b) Valse Marylin (Wiedoeft); Violin Solos: (a) It aint no Fault of Mine (Davis Williams), (b) Foxtrot, (c) Waltz, (d) Quickstep; Orchestra: Dixieland One-step. In the Interval, Recitation. The Comedian Harmonists. 9.25, News. 9.40, Gramophone Records. 9.55, Dance Music.

SATURDAY  
OCTOBER THE TWENTY-FIRST

In an interval at 11.0, Time Signal and Chimes from the Town Hall. 11.15 (approx.), Close Down.

CORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,325 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C. Happy Hour. Part I: Trio Concert: Signature Tune, Narcissus (Nevin); Un peu d'amour (Silesu); Violin Solo: The Song of Songs (Moya); Pizzicato from Sylvia (Delibes); Friend o' Mine (Sanderson); Chorus: Somewhere a voice is calling (Tate); Toredor et Andalouse (Rubinstein); Pearl of Mine (Fletcher). Part II: Dance Music: Let's all be happy together; Down in the Valley; My Lucky Day; In memory of you; Avalon; I wish I had Wings; Dancing to save your soul; Nobody's Sweetheart; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0 p.m., Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Military Band Concert for Tunbridge Wells and Isle of Thanet: Signature Tune, The Night by the Sea; Selection from The Vagabond King (Friml); Jungle Drums (Kettelbey); Squirrel Dance (Elliott-Smith); Fighting Mac (Traditional); On the Quarter Deck (Alford); Brabazon (Dunn); In a Monastery Garden (Kettelbey); The Changing of the Guard. 5.30, Orchestral Concert for Dover and Folkestone: By the Swanee River (Myddleton); Song, The Company Sergeant-Major (Sanderson); Under Heaven's Blue (Payan); Song, Le Réve passe (Krier); Song, In Sheltered Vale (Clarke); Spanish Serenade (Herbert); Chinese Serenade (Herbert); Selection from Wiener Blut (Strauss); By the Sleepy Lagoon (Coates); Signature Tune. 6.0, Programme in French. 11.0 till Close Down, Programme in English by the I.B.C. 11.0, Talkie Time: Signature Tune, Sittin' in the Dark; There's Magic in the Air (Eyton); Mrs. Bartholomew (Ellis); City Lights; Why has a Cow got four legs? (Ellis); Selection, The Crooner; Sweetheart Darlin' (Stophart); Talking to you about me (Snyder); Lady Divine (Kountz); Signature Tune. 11.30, Concert by the International Broadcasting Company (Ireland), Ltd.: Signature Tune, Come back to Erin; Invitation to the Waltz (Weber); Cello Solo: Harlequinade (Squire); Biddy Mulligan (Kavanaugh); Idylle bretonne (Gennin); Love Screenade (Blon); Coal Black Mammy (Cliff); Ay, Ay, Ay (Friere) Selection from Die Fledermaus (Strauss); Signature Tune, Come back to Erin. 12.5 a.m. (Sunday), Late News Bulletin in English. 12.10 (approx.), Club Concert for Maidstone Listeners: Signature Tune, The Chum Song; I wanna count sheep (Young); Manita Perdon (Villamonte); I'm telling the world she's mine (Maurice); Sophisticated Lady (Ellington); Oh, you sweet thing (Hines); Sweet Dreams Pretty Lady (Downey); Carry me back to Green, Green Pastures (Pepper); A Girl like Nina (Hammerstein); Lazybones (Mercer); Wedding of the Dragonflies (Myers); In the Park in Pavee (Rainer); Come out Vienna (Herbert); Little Miss Muffett (Perritt); Learn to Croon (Coslow); Signature Tune. 1.0, Dance Music: Signature Tune, Bells of Normandy; It's Sunday down in Caroline; At the Old Pig and Whistle; I wanna count sheep; Hold me; Seven years with the wrong woman; Dance Pretty Lady; It was a night in June; Reflections in the Water; Under a Blanket of Blue; Avalon; Down in the Valley; Waltzing in a Dream; I sigh for you, Rio Rita; Tick, Tock; Ho, ho, you can't ride this Train; Isn't it Heavenly; Signature Tune. 2.0, I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

## FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35, See Langenberg. 1.30 to 2.30, See Stuttgart. 2.30, Weather. 2.40, Time and Economic Notes. 3.0, See Stuttgart. 5.0, Talk: The Frontier Question. 5.20, Review of the Week. 5.35, Programme to be announced. 5.50, News. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, Topical Talk. 7.10, Bunter Abend. 9.0, News. 9.20, See Stuttgart. 9.30, News. 9.45, See Stuttgart. 10.0 till Close Down, see Langenberg. 1.0 a.m. (Sunday), Close Down.

FREDRIKSSTAD.—See Oslo.

FREIBURG.—See Stuttgart.

GENEVA.—See Radio-Suisse Romande.

GENOA.—See Turin.

GLEIWITZ.—See Breslau.

GOTEBORG.—See Stockholm.

GRAZ.—See Vienna.

HAMAR.—See Oslo.

## HAMBURG

805 kc/s, 372 metres; 1.5 kW.—Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530

OCT. 21st **SATURDAY** continued

kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., Orchestral Concert, conducted by José Eibenschütz. A Festival Overture (Wagner); Two Pieces (Grieg): (a) Herzwunden, (b) An den Frühling; Selection from Aida (Verdi); Wedding Waltz from The Veil of Pierrette (Dohnanyi); Selection from Schön ist die Welt (Lehár). 4.0, Topical Programme. 4.30, Variety Programme. 5.35 (from Kiel). Religious Address. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, Bunter Abend. In the interval from 9.0 to 9.30, News. 11.0 (approx.), Close Down.

HANOVER.—See Hamburg.

**HEILSBERG**

1,085 kc/s, 276.5 metres; 60 kW. Relayd by Danzig, 662 kc/s, 453.2 metres.—10.30 a.m. (from Danzig), Concert by the Danzig Police Band, conducted by Ernst Stiecheritz: Overture, Im Reiche des Indra (Lincke); Egyptian March (Jos. Strauss); Selection from Drei alte Schachteln (Kollo); Liebestraum-Walzer (Czibulka); March from Fatinitza (Suppé); Selection from The Little Dutch Girl (Kálmán); Zigeunerleben (Schumann); Waltz, Sommerabend am Rhein (Zelner); Gavotte, Blümlein Vergissmichinnicht (Giese); March, Bona Fortuna (J. E. Wagner). 12.5 p.m., Gramophone Concert. In the intervals at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.30, Handwork for Children. 3.0, Concert. In an interval at 3.50, A.D.A.C. Traffic Report. 4.50, Discussion on Road Accidents. 5.5, Forthcoming Programme Events. 5.15, Agricultural Prices. 5.25, Organ Recital by Traugott Fedtke: Organ Concerto No. 8 in A (Händel); Partita on the Choral, Jesu meine Freude (Walter). 5.50, Weather. 6.0, Transmission for all German Stations; East Prussian Songs and Dances (arr. Rudolf Kaestner). 7.0, News. 7.10, Bunter Abend, relayed from the Town Hall, Königsberg. 9.10, News. 9.20 (approx.), Variety from Berlin (Funkstunde). 11.30 (approx.), Close Down

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW, up to 5.40 p.m., and 20 kW, from 5.40 p.m.—11.40 a.m. till Close Down, Programme by the Workers Radio Society (V.A.R.A.). 11.40 Orchestral Concert, conducted by Wims: Smokey mokes (Holzmann); Wiener Praterleben (Translatour); Andante and Scherzo (de Michel); Romance (Messager); Spanish Rhapsody (Richardy); Dornröschens Brautfahrt (Rhoda); Gramophone Records, Venetian Serenade (Foupprain); Serenade (Raehmaninov); Fest der Zwerge (Kockert); Phantom Melody (Kettelbey); Spanish Dance (Moszkowsky); Melody (Rhode). 12.55 p.m., Gramophone Music. 1.40, Interval. 1.56, Gramophone Music. 2.30, Talk. 2.40, Concert by the Amsterdam Symphony Orchestra, conducted by Smit: In New York Style (Howard); Berlin wie es weint und lacht (Conrad); Air (Ertl); Backfischen Parade (Lincke); Selection from Il Trovatore (Verdi); Folk Melody (Frederiksen); The Cockshafers' Tea Party (Noack). 3.40, Recital by Weissbach (Tenor); and Steyn (Organ and Pianoforte). 4.10, Film Talk. 4.30, Orchestra Concert (contd.): Waltz Potpourri (Robrecht); May Song (de Michel); De verjaardag van Piet de Smeerpotes (Becke); Lotosblumen (Ohlsen); Lockenköpfchen (Eilenberg); Wiener Spaziergänge (Koniak). 5.5, Gramophone Music. 5.10, Literary Talk. 5.42, Choral Concert. 6.10, Talk on Music with Illustrations. 6.40, Talk. 7.10, Gramophone Music. 7.40, SOS Messages. 7.42, Press Review and Announcements. 7.55, Orchestral Concert, conducted by De Groot: Soloists: Mile, Sala (Soprano) and Wigge-lara (Violin); de Klijn (Violin), and Wims (Pianoforte); Overture, Il Seraglio (Mozart); Soprano Aria from Il Re pastore (Mozart); Two Slav Dances (Dvorák); Hayanaisé for Violin and Orchestra (Saint-Saëns); Soprano Aria from Madame Butterfly (Puccini); Overture, Mignon (Thomas); Mock Morris (Grainger); Shepherd's Hey (Grainger); Rhapsody in Blue (Gershwin). 8.55, Talk. 9.5, Organ Recital by Jong. 9.25, Recitations. 9.45, Concert by De Flierefluiters, conducted by van der Horst with Song Refrains by de Booy. 10.40, Gramophone Music. 11.40 (approx.), Close Down.

HORBY.—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW, until 3.40 p.m. Transmitted from Kootwijk on 50 kW, from 3.40 p.m.—Programme by the Catholic Radio Society (K.R.O.). 11.55 a.m., Concert by the Vienna Station Octet. Radetzky March (Strauss); Troika (Bottaro); Overture to an Operetta (Suppé); Serenade (Widor); Spanish Dance No. 2 (Moszkowsky); Ballet Music from Sylvia (Delibes-Weminger); Jalonsie (Gade); Gramophone Records; Selection from The Czarevitch (Lehár); Minuet (Paderewsky); Rumänische Liebesnacht (Köping); Hungarian Dances Nos. 5 and 6 (Brahms); Finale. 1.25 p.m., Interval. 1.40, Programme for Young People. 2.10, Programme for Children. 3.40, Concert by the

K.R.O. Orchestra, conducted by van 't Woud. Dem Leuz entgegen (Blankenburg); Overture, Casanova (Lincke); In a Fairy Realm (Kettelbey); Waltz, Roses from the South (Strauss); Selection from The Duchess of Chicago (Kálmán); Overture, Indigo (Strauss); Potpourri, Musical Soap-bubbles (Urbach); In the Harbour of Port Said (Arnandola); An Evening in St. Petersburg (Helmund); Tritsch-Tratsch (Strauss); Selection from The Dollar Princess. In the intervals at 4.10, Talk on Writing, at 4.55, News in Esperanto and at 6.0, Press Review. 6.40, Police Notes. 6.55, Talk. 7.15, Gramophone Music. 7.25, Sports Talk. 7.40, Concert by the K.R.O. Boys. 8.10, News. 8.15, Gramophone Music. 8.40, Wie is de Moor-denaar (Who is the Murderer?)—Play in Three Acts (Hollander). 9.25, Concert by the K.R.O. Boys. 9.55, Variety Programme on Gramophone Records. In the interval at 10.10, News. 10.30, Concert by the K.R.O. Boys (contd.). 11.40, (approx.), Close Down.

INNSBRUCK.—See Vienna.

KALUNDBORG.—See Copenhagen.

KIEL.—See Hamburg.

KLAGENFURT.—See Vienna.

KOSICE.—See Prague.

**LAHTI**

167 kc/s, 1,796 metres; 40 kW. Relayd by Helsinki, 815 kc/s, 368.1 metres.—5.35 p.m., Finnish Festival Programme. 7.45, News in Finnish. 8.0, News in Swedish. 8.15, Dance Music from the Pörsö Restaurant.



A "La Scala Opera" night at Milan is always something worth waiting for. Here is a front view of the Scala, probably the most famous opera house in the world.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—12.35 p.m., Concert by the Small Münster Orchestra, conducted by Werner Gühr: Overture, Raymond (Thomas); Waltz (Debussy); Serenade (Albeniz); Selection from Si j'étais roi (Adam); A Wedding Day on Troldhaugen (Grieg); Selection from The Gipsy Baron (Joh. Strauss). 1.30, See Stuttgart. 2.30, Economic Notes. 2.45, Programme for Young People. 3.0, See Stuttgart. 5.0 to 5.35, See Frankfurt. 5.35, Musical Programme. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0 to 9.20, See Frankfurt. 9.20, See Stuttgart. 9.30, News and Weather. 9.40, An Old People's Festival Evening, relayed from the Solingen Town Hall. 10.0, Cabaret Programme, conducted by Baumgartner. 12 Midnight, Gramophone Concert of German Opera Music: Overture and Two Arias from The Barber of Bagdad (Cornelius); Overture and Agatha's Aria from Der Freischütz (Weber); Chorus and Two Quartets from Fidelio (Beethoven); Overture, Tannhäuser (Wagner).

LAUSANNE.—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayd by Dresden, 941 kc/s, 319 metres.—12.35 p.m., See Langenberg. 1.30, News. 1.45, Programme for Children. 2.30, Book Review. 2.45, Economic Notes and News. 3.0, Concert relayed from Berlin (Funkstunde). 4.0, Talk: The Experiences of Six Young People travelling through Holland. 4.20, A

Modern Dictionary. 4.30, Talk. 4.50, Reading of Ballads (Kurt Geucke). 5.0, Dances from Eighteenth Century Viennese Masques—The Emdé Orchestra conducted by Heinrich Werlé and Soloists. 5.50, To-day's News. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0 (from Dresden), Concert of Operetta Music by the Dresden Philharmonic Orchestra, conducted by Ernst Schickelanz and Soloists: Overture, Carnival in Rome (Joh. Strauss); Soprano Solo: Song to the Virgin Mary (Genée); Flöster-quartett from Der Seekadet (Genée); March from Fatinitza (Suppé); Tenor Solo from Der Göttergatte (Lehár); Two Tenor Solos (Schickelanz); (a) Klein Mädchen, (b) Ich bin ein Student; Trio from Der Vizeadmiral (Mill-öcker); Pizzicato Polka (Jos. Strauss); Baritone Solo from Chansonette (Delling-er); Duet (Müller); Tenor Solo and Duet from Der Vizeadmiral (Millöcker); Waltz, Wo dei Zitronen blüh'n (Strauss); Overture, Der Waldmeister (Joh. Strauss); Baritone Solo: Ballad (Müller); Duet from Saint Cyr (Delling-er); Tenor Solos: (a) Song from Das süsse Madel (Reinhardt), (b) Couplet from Chansonette (Delling-er); Polka (Jos. Strauss); Tenor Solos: (a) Wann i a Musik hir' (Schickelanz), (b) Song from Sonntag-kind (Millöcker); Soprano Solo from Boecaccio (Suppé); Tenor Solos: (a) Volga Song from The Czarevitch (Lehár), (b) Rasch verfliegt Soldatenliebe (Müller); Duet, Bei mir ist morgen Schützenfest (Schickelanz); Quartet from Frühlingsluft (Jos. Strauss-Reiterer); Florentine March (Fucik). In the interval at 9.0, News. 10.0, Dance Music

by the Emdé Orchestra. 11.0 (approx.), Close Down.

LINZ.—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0, Talk. 6.30, Review of Foreign Affairs. 7.0, Humorous Programme. 7.45, Accordion Solos. 8.30, Time and News. 8.45, Concert by the Station Orchestra. 10.0 (approx.), Close Down.

**LUXEMBOURG**

352 kc/s, 1,191 metres; 200 kW.—French Evening. 7.0 p.m., Chamber Music on Gramophone Records, Quartet in G Minor (Debussy); Sonata in C (Mozart). 7.40, Concert by the Station Orchestra, conducted by Henri Pénis. Overture, Les Francs-Juges (Berlioz); Suite variée (Pierné); Danse macabre (Saint-Saëns). 8.20, Pianoforte Concerto in A Minor (Grieg). 8.50, News in French. 9.0, Concert by the Station Orchestra. La source (Delibes). 9.15, Song Recital by Marie-Thérèse Grosjeu-de Cuyper. 9.50, News in German. 10.0, Gramophone Music. 10.40, Dance Music.

**LWOW**

788 kc/s, 381 metres; 16 kW.—6.40 p.m., See Warsaw. 10.5, Mandoline Concert. 11.0 (approx.), Close Down.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.40 a.m., Radio Gazette for Lyons and the South-East. 8.30, Relay from Paris (Ecole Supérieure), 671 kc/s, 447.1 metres. After-the-Relay, News.

**MADRID**

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—6.0 to 8.0, Programme for Listeners in the Canary Islands, Guinea and Europe. 6.0, Concert of Popular Music. 7.15, Talk. 7.30, Light Music. 8.0 to 10.30, Interval. 10.30, Variety Programme relayed from Madrid (EAJ7). 12 Midnight till Close Down, Programme in English by the I.B.C. I.B.C. Concert. Dreams on the Ocean; The Siege of Monte Carlo; A South American Romance; Whistle and blow your cares away; There's a House on the Hill; Cancion de Amalio; A penny for your Thoughts; A Song, a Kiss, a Girl. 12.30 a.m. (Sunday), I.B.C. Good-night Melody.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Talk and Dance Music. 8.15, Topical Review. 8.30, Interval. 9.15, English Lesson. 9.30, Chimes, Time, Topical Review. 9.40 (approx.), Variety Programme with Margarita Cueto (Soprano) and the Author, Luis de Tapia (Readings). 11.45, Topical Review. 12 Midnight (approx.), Close Down.

MALMO.—See Stockholm.

MILAN.—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Military Band Concert. 3.50, See Prague. 4.25, Gramophone Music. 4.36, See Prague. 4.50, Talk. 5.5, Topical Talk. 5.15, See Prague. 5.25, Concert of Light Music by the Station Orchestra. 6.0 to 9.15, See Prague. 9.15, See Brno. 10.30 (approx.), Close Down.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather. 1.45 p.m., Weather Report. 2.0, Musical and Literary Programme. 3.0, Wireless Talk. 3.30, Voronai Slobodka—Comedy (Ilf and Petrov) with Music. 4.30, Talk: Science and Technics. 5.30, Beethoven and Brahms Chamber Concert. 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

MOTALA.—See Stockholm.

MUHLACKER.—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayd by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—4.0 p.m., Orchestral Concert, conducted by Erich Kloss: Overture, L'oca del Cairo (Mozart); Zigeunerlieder (Brahms); Polonaise and Rondo (Weber); Schubert Potpourri (Ralf); Waltz from Baby (Heuberger); Potpourri, Musikalisches Kunterbunt (Sehmalstich); Wiegenlied (Kjerulf); Spanische Patrouille (Deshayes). 5.0, Programme for Young People. 5.30, German Folk Songs to the Lute by Robert and Lies Kothe. 5.45, Wireless Hints. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0, Variety Concert by the Station Orchestra and Soloists: Conductor: Karl List; Soloists: Arno Eichhorn (Bass), Ernst Krauss (Piccolo), Franz Heigl (Trumpet), and Josef Machor (Xylophone); Hauptmann-Göring-Marsch (Taubé); Overture, Edelweiss (Kozzak); Humorous Items; Piccolo and Trumpet; Elefant und Mücke (Klug); Im schönen Tal der Ear (Lühr); Xylophone Solos: (a) Alsatian Peasant Dance (Merking), (b) Polka, Herz-klopfen (Rieder); Two Bass Solos: (a) Song from Martha (Flotow), (b) Als Bühlein klein (Nikolai); Waltz, Die Hydropathen (Gungl); Purzelbaum-Galopp (Lincke). In the interval, Talk from Nürnberg. 9.0, Time and News. 10.0, Serenade by the Radio Dance Band. 11.0 (approx.), Close Down.

NAPLES.—See Rome.

NOTODDEN.—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW.—Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—3.30 p.m., Gramophone Music. 4.15, Programme for Children. 5.15, Concert of Norwegian Music. 5.45, Talk on Economics. 6.0, Announcements, Weather and News. 6.30, Concert by the Station Orchestra, conducted by Kramm. Overture, Die Matrosen (Flotow); Second Suite from L'Arlesienne (Bizet); Intermezzo from L'Amico Fritz (Mascagni); Selection from Cavalleria rusticana (Mascagni); The Nutteracker Suite (Tchaikovsky). In an interval at 7.0, Time Signal and Humorous Recitation. 7.50, Talk. 8.20, Concert (contd.): Persian Dance (Svend-son); Potpourri of Popular Norwegian Melodies (Schütttauf); Norwegian Military March (Olson). 8.40, Weather and News. 9.0, Topical Talk. 9.15, Variety Programme. 9.30, Dance Music on Gramophone Records. 10.30 (approx.), Close Down.

OSTERSUND.—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Popolavoro Notes, Tourist Talk, Agricultural Report and Giornale Radio. 7.20,

Gramophone Music. In the interval at 7.25, Sports Notes, and at 7.30, Time and Announcements. 7.45, Primarosa—Operetta in Three Acts (Pietri). In the intervals, Book Review and Notes. 10.0, Giornale Radio.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Music. 7.15, Le Journal Parlé. 7.30, Mendelssohn Music on Gramophone Records: Spring Song; The Bee's Wedding; Die Spinnerin; Scherzo from A Midsummer Night's Dream. 7.50, The Week's Review. 8.0, Talk. 8.25, Gaillard Concert of Chamber Music. Soloists: Mme. Mildah Pona, Lucien Bellanger (Violin) and the Composer. 9.10, Concert. 11.0, News.

PARIS

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.30 a.m., Weather and Physical Culture. 7.45, Gramophone Records. Leila (Dauber); L'Etoile (Delmet); vous êtes jolie (Delmet); Moorish Serenade (Chap); Dolorita (Dukas-Gardoni). 8.0, Weather and Press Review. 9.0 to 11.0, Concert, relayed from the Hall of the Old Conservatoire. 12 Noon, Gramophone Records. Pour qu'on rigole (Sylvano); Parfums viennois (Curti); Adieu Hawaii (Bordin); Paris Musette (Marceau); Mariannina (Guida); Lolita (Egen-Grothe); Mause (Abraham); My Heart is Yours (Brown); Minuet (Bolzoni); Ma Loulou, non Amour (Borel-Clerc); Je ne t'aime plus (Cazes-Cynane); Bruno-Zayas (Castellanos); Love Song (Bixio); Dou-dou (Delannoy); Valentine (Christine); Le vieux Mendiant (Delmet-Bernard); Mon Bateau (Drigo). Les deux amis (Challer); Seduction (Cazes); Média-fal Serenade (Costa); Valse chaloopée (Dubourg); The Wedding of the Painted Doll (Brown); Le long du Missouri (Christine); Pimpernelle (Abita); Trink-Trink (Bendix); Yasmina (Avignon); Selection from The Gipsy Princess (Kálmán); Madrigal (Simonetti); Glow-worm Idyll (Lincke); La Chasse aux Cailles (Paradis); Ideale (Tosti); Les Fauvettes (Bousquet); Saudades do Brazil (Milhaud). In the interval at 1.0 p.m., Exchange, News and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.0, Programme for Children. 3.45, Exchange and Market Prices. 6.30, Agricultural Talk. 6.50, Gramophone Records. Machines (Abraham); Serenade à Janette (Danjaume); The Water Mill (Evans). 7.0, Massenet Concert on Gramophone Records. Ce que disent les Cloches; Eley; Enchantment; Noël païen; Si tu veux, Mignonne; Pensée d'automne; Scènes pittoresques. 7.45, Latin Press Review. 8.0, Radio Report. 8.30, News and Weather. 8.40, Review by Rieux. 8.45, Programme of Chansonnettes by Mmes Guillet and Bertrande and Mm. Varenne, Cor and Wyl. Georges Ferré at the Pianoforte. In the interval at 9.15, Press Review and News.

PITTSBURGH

KDKA, 920 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.85 metres; and 25.27 metres.—7.0 to 11.0 p.m., New York Relay. 7.0, Musical Originalities. 7.30, Concert Echoes. 8.0, Words and Music. 8.30, Wealth of Harmony. 9.0, Dance Masters. 9.30, Concert Favourites. 10.0, Casino Orchestra. 10.30, Neil Sisters. 10.45, Orphan Annie. 11.0, News and Piano Classique. 11.15, Sports, Pat Haley. 11.30, A Recreo-Bill and Alex. 11.45, Wing Dope, from New York. 12 Midnight, Happy Felton's Orchestra. 12.30 a.m. (Sunday) to 3.0, New York Relay. 12.30 a.m., Circus Days. 12.45, Anie, Judy and Zeke. 1.0, Waldorf Astoria Orchestra. 1.30, Sous les Ponts de Paris. 2.0, Jambouree.

PORSCRUND.—See Oslo.

PRAGUE

614 kc/s, 458.6 metres; 120 kW.—3.0 p.m., See Moravská-Ostrava. 3.50, Programme for Young People. 4.15, Talk for Workers. 4.25, Gramophone Music. 4.35, Czech Lesson for Germans. 4.50, Gramophone Music. 5.5, Agricultural Programme. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Savitri—Opera di camera (Holst). 6.0, Time and News. 6.10, Reading. 6.25, Variety Programme. 7.40, Marie Majerova reads from her own works. 7.55, Brass Band Concert. 8.30, Concert by the Station Orchestra, conducted by Parik. Overture, Sebastian and Viola (Weis); Polichinelle Op. 106 (Prozavnik); Waltz, Roses from the South (Strauss); March (Kubin). 9.0, Time, News and Sports Notes. 9.15, Sec Brno. 10.30 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW; and Geneva, 395 kc/s, 760 metres.—5.0 to 6.15 a.m. (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Gramophone Music. 12 Noon (from Lausanne), Financial Notes. 12.10 p.m., (from Geneva), Gramophone Concert. 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0 (from Lausanne), Concert by the Small Station Orchestra, conducted by Moser. 3.45 (from Lugano), Concert. 5.0 (from Geneva), Programme for Children. 5.20 (from Geneva), Talk for Young People. The League of Nations. 5.40 (from Geneva),

Film Talk. 6.5 (from Geneva), Talk: The Music Season. 6.30 (from Geneva), Radio Chronicle. 7.0 (from Geneva), Song Recital. 7.20, Mozart Concert by the Radio-Suisse Romande Orchestra, conducted by Echenard. Soloist: Emile Huber (Pianoforte); The Paris Symphony, Concerto in G for Pianoforte and Orchestra. Contradances; Rondo, from the Concerto in D for Pianoforte and Orchestra. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—11.0 a.m., Weather Forecast. 1.15 p.m., Variety Programme. 4.0, Weather Forecast. 8.5, Programme for Children. 8.10, Weather Forecast. 8.20, Music and Announcements. 9.0, Fireside Programme. 10.0, Time and News, followed by Dance Music. 1.0 a.m. (Sunday), Close Down.

RIGA

572 kc/s, 525 metres; 15 kW.—5.30 p.m., Eugene Onegin—Opera in Three Acts (Tchaikovsky), relayed from the Opera House. In the intervals, News and Weather. After the Programme, Dance Music by the Vlseks Band. 10.0 (approx.), Close Down.

RJUKAN.—See Oslo.

ROME

Call 1R0, 680 kc/s, 441 metres; 60 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.45 p.m.; and 2R0, 11,810 kc/s, 25.4 metres, from 4.15 p.m. (approx.).—11.30 a.m., Gramophone Music. 12 Noon, Orchestral Concert. In the interval from 12.30 to 12.45 p.m., Giornale Radio and Exchange. 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Report of the Royal Geographical Society. 4.10, Weather. 4.15 to 5.0, Orchestral Concert. 5.40 (Naples), Shipping and Sports Notes. 5.45, Morse Signals and Dopolavoro Report. 6.0, Tourist Report. 6.10, Wheat Market Report. 6.30, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Song Recital by Vera Nania Poggioli (Soprano). 7.30, Giornale Radio and Sports Notes. 7.45, Gramophone Music. 8.0, See Turin. 10.0 (approx.), Giornale Radio.

SALZBURG.—See Vienna.

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.43 metres, and by W2XAD on 19.56 metres.—12.45 a.m. (Sunday), Stock Reports. 1.0 to 3.0, New York Relay. 1.0, Rollickers. 1.15, Herman and Banta (Instrumentalists). 1.30, Sous les Ponts de Paris. 2.0, Baron Munchausen. 2.30, Popular Programme. 3.0, Saturday Night Dancing Party, from New York, followed by Programme Résumé.

SCHWEIZERISCHER

LANDESENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.5 metres.—5.50 to 6.5 a.m., Gymnastics. 11.0 (from Berne), Light Music on Gramophone Records. 11.29, Time Signal from Neuchâtel Observatory. Weather and News. 11.40 (from Berne), Gramophone Music (cont'd.). 12.25 p.m. (from Berne), Time, Weather and Exchange. 12.30 (from Berne), The Listeners' Quarter of an Hour. 12.45 (from Berne), Book Review. 1.15 (from Berne), Swiss Gramophone Music. In the interval at 1.30 (from Berne), Talk: How Sugar is Made. 2.0 to 3.0, Interval. 3.0 (from Berne), Concert by the Fehrsinn Harp Society. 3.30 (from Berns), Talk. 3.45, Programme (to be announced) relayed from Lugano. 5.0 (from Basle), Gramophone Music. 5.30 (from Basle), Programme for Children. 6.0, (Chimes from Zürich Churches. 6.15 (from Basle), Time, Weather and Market Prices. 6.20 (from Basle), Opera and Operetta Music on Gramophone Records. 7.0 (from Basle), Kreuz and Quer—Radio Sequence (Paul Meyer-Gutzwiller and Werner Hausmann). 7.30 (from Basle), Concert by the Basle Orchestral Society. In the interval at 8.0, Weather and News. 9.10 (from Basle), Dance Music. 10.0 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 221.5 kc/s, 1,354.4 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—3.0 p.m. (from Göteborg), Concert: March, Stars and Stripes (Souza); Waltz, (Moszkowski); Overture, Mignon (Thomas); Sogno d'amore (Beccè); Selection from Madame Butterfly (Puc-

cini); Serenade (Peterson-Berger); Tango, Die Sache, die man Liebe nennt (O. Straus). 4.5, Programme for Children. 4.30, Talk. 5.0, Gramophone Music. 6.0, Dialogue. 6.30, Comedy (Oljelund). 7.0, Dance Music by a Wind Instrument Orchestra. 7.30, Dialogue. 8.0 (from Östersund), Cabaret Programme. 8.45, News and Weather. 9.8, Dance Music. 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Modern French Music on Gramophone Records. Extracts from Le Festin de l'Araignée (Roussel); Elégie (Fauré); Vie antérieure (Duparc); Extracts from Korrigane (Widor); Scène et, pas des deux pigeons from Les deux Pigeons (Messager); Mother Goose Suite (Ravel); Marche écossaise (Debussy). 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Gramophone Concert. Overture, Die Fledermaus (Joh. Strauss); Zigeunerweisen (Sarasate); Turkish Patrol (Michaelis); Patrouille (Popy); Overture, Mignon (Thomas); Selection from Benvenuto Cellini (Berlioz); Hungarian March from The Damnation of Faust (Berlioz); Offenbach Potpourri. Selection from The Daughter of the Regiment (Donizetti). 2.0, Legal Talk in German. 2.15, Gramophone Concert. 3.0, Music Talk. 4.0, Recital by Caruso on Gramophone Records. 5.0, Symphony Concert, relayed from Paris (Eiffel Tower). 7.0, French Lesson. 7.15, Illicit cultural Talk. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Concert by the Station Orchestra, conducted by Maurice de Villers. Soloists: Paniard (Tenor) and Mme. Inès Maujean (Soprano); Ballet Airs (Gluck); Soprano Solo: Air (Handel); Flute Solo: Minuet from Orpheus (Gluck); Tenor Solo from Joseph (Méhul); Gipsy Suite for Violin and Orchestra (Wormser); Tenor Solos: Neapolitan Songs; Concert Piece for Pianoforte and Orchestra (Chaminade); Selection from Othello (Verdi). In the interval at 9.30 (approx.), Press Review. 10.30, Dance Music, relayed from the Savoy. 12 Midnight (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.35 p.m., See Langenberg. 1.30, Programme for Young People. 2.15, Morse Lesson. 2.30 (from Karlsruhe), Accordion Concert. Conductor and Soloist: Baumgartner. Der alte Berner Marsch (arr. Heibling); Potpourri of Strauss Waltzes (arr. Thöni); Accordion Solo; Military March No. 1 (Schubert); Ländler, Lustig und fidel (Heibling); March, Tiroler Holzackerbauern (J. F. Wagner). 3.0, Concert by the Station Orchestra and the Tegernsee Trio. Conductor: Gustav Grölich. Overture, Die schöne Galathée (Suppé); Selection from The Mikado (Sullivan); Martin-Walzer (Zeller); March, Kunst und Natur (Schrammel); Trio: Three Pieces (Krauzov): (a) Adieu, Frühlings-sänger im Walde, (b) Alm-Lieder, (c) Tölzer Schützen-Marsch; Potpourri of Popular Songs (Lincke); Melody (Löhr); Waltz, Ball-sirenen (Lehár); Brueker Lager-Marsch (Kral); Trio: Three Pieces: (a) Upper Bavarian Ländler (Reiter), (b) Bavarian Song Potpourri, (c) Kaiserjäger-Marsch (Mühlberger). 5.0, See Frankfurt. 5.20, Review of the Week. 5.35 (from Freiburg), Talk for the Centenary of the Birth of Alfred Nobel. 5.50, Time and Announcements. 6.0, Transmission for all German Stations, relayed from Heilsberg. 7.0 to 9.20, See Frankfurt. 9.20, Talk: Things you should know. 9.30, News. 9.45, Concert of Light Music. 10.0 till Close Down, See Langenberg. 10.0 a.m. (Sunday), Close Down.

SUNDSVALL.—See Stockholm.

TOULOUSE

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Popular Songs. 6.30, Orchestral Music. 7.0, Violin Recital: Zigeunerweisen (Sarasate); Meditation from Thaïs (Massenet); Cavatina (Raff); Trümmerei (Schumann). 7.15, News. 7.30, Arias from Operas: Aria from Der Freischütz (Weber); Aria from Hérodiade (Massenet); Marguerite's Aria from Mephistopheles (Boito); Cavatina from Norma (Bellini). 7.45, Music by a Viennese Orchestra. 8.0, Songs from Sound Films. 8.15, Military Music. 8.30, Songs from Operettas. 8.45, Orchestral Pieces. 9.0, Tosca—Opera (Puccini)—Concert. Version, followed by Orchestral Music. 10.0, Light Music. 10.15, North African News. 10.30, Concert for Listeners in Morocco. 11.0, Request Music. 11.15, Dance Music. 12 Midnight, News. 12.5 a.m. (Sunday), Opéra-Comique Music: Airs from (a) The Fair Maid of Perth (Bizet), (b) Sappho (Massenet); Duet from Le Châlet (Adam). 12.15, Orchestral Music. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

TRONDHEIM.—See Oslo.

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Talk for Women. 4.20, Gramophone Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Lottery Results, Dopolavoro Announcements and Gramophone Music. 6.0, Time, Tourist Talk and Gramophone Music. 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio and Weather. 7.25, Talk: Events and Problems, followed by Gramophone Music. 8.0, Aida—Opera in Four Acts (Verdi), relayed from the Vittorio Emanuele Theatre. In the intervals: Talk, Book Review and Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning); and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—11.0 to 11.15 a.m., Religious Announcements in Various Languages. 8.0 to 8.15 p.m., Religious Information in Italian.

VIENNA

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m., Gramophone Concert. 10.55, Weather. 11.0, Orchestral Concert, conducted by Max Geiger: Festival Overture (Leutner); Waltz, Les Sirènes (Waldteufel); Selection from La Bohème (Puccini); Entry March of the Boyards (Halvorsen); Suite Campestre (Amael); Potpourri of Romanian Songs and Dances (Geiger). 12 Noon, Time and News. 12.10 p.m., Concert (cont'd.): Bizet Fantasia (Urbach); Caucasian Suite (Ippolitov-Ivanov); Potpourri, Dividenden (Morena); Tango from The Lady of the Rainbow (Gilbert); Potpourri, Wiener Spezialitäten (Hrubý); March, Tatzmannsdorfer Klänge (Geiger). 2.0, Time, Weather, and Market Prices. 2.15, Italian Lesson. 2.45, Mandoline Concert, conducted by Dr. Leopold Bracharz. 3.20, Talk with Gramophone Illustrations: The Piedigrotta Festival in Naples. 3.55, Gramophone Concert. 5.0, Talk: The Nobel Prize and its Founder. 5.30, Talk: World Events of the Past Month. 6.0, Topical Talk. 6.15, Time and News. 6.30, Demonstration in Honour of Dr. Dollfus by the Austrian Storm Troops, with an Address by the Minister for Education and Justice, Dr. Kurt Schuschnigg, relayed from the Konzerthausaal. 7.30, To-day's Motto. 7.35, Merry Student Days—Concert by the Wiener Symphoniker, conducted by Josef Holzer, and the Vienna Male Voice Choir. Soloists: Maria Tauber-Proske (Soprano) and Dario Medina (Tenor); Extracts from Jung-Heidelberg (Müllacker-Reiterer); Waltz, Studententanz (Joh. Strauss); Choir: Student Song, Filia hospitalis; Chorus and Duet from Prinzess Gretel (Reinhardt); Potpourri of Student Songs (Klimsch); Extracts from I left my Heart in Heidelberg (Raymond); March, Burschen heraus (Eysler); Chorus: Student Song, Wir lügen hinaus in die sonneige Welt; Soprano Song from Der arme Jonathan (Müllacker); Tenor Solo, Beim wirt zum gold'nen Fassel (Prechtl-Riedinger); Tenor Solo (Raymond); Student March (Rieger). 9.5, News. 9.20, Dance Music by (Cinre Hegeßdi and her Orchestra, relayed from the Café Palmhof. After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Military Music on Gramophone Records. 11.30, Radio Journal and Weather. 11.35, Dance Music on Gramophone Records. 12 Noon, Interval. 2.30 p.m., Economic Notes. 2.40, News. 2.55, Aviation Report and Anti-Gas Drill. 3.0, Programme for Invalids, relayed from Lwów, 788 kc/s, 381 metres. 3.40, French Lesson. 3.55, Concert by the Warsaw String Quartet: Quartet in F (Dvorak); Quartet in F Minor (Smetana). 4.30, Agricultural Press Review, relayed from Lwów. 5.0, Talk: Poland To-day. 5.20, Light Music from the Adria Café. 6.5, Miscellaneous Items. 6.25, Reading. 6.40, Radio Journal. 7.0, Concert by the Station Orchestra, conducted by Nawrot. Soloist: Mierziewski (Songs). Selection from Herbstmäuerl (Kálmán); Songs; Minuet (Kiesewetter); Indian War Dance (Lumby); Selection from Il carillon magris (Pick-Mangiala); Pizzicato Polka (Jos. Straus); Songs; Waltz, Badner Mädel (Komzak); March (Lewanowski). 8.0, Wireless Talk. 8.15, Chopin Recital. 9.0, Talk in Foreign Language. 9.15, Sports Notes. 9.25, Dance Music from the Ziemińska Café. In the interval at 10.0, Weather and Police Notes.

WILNO

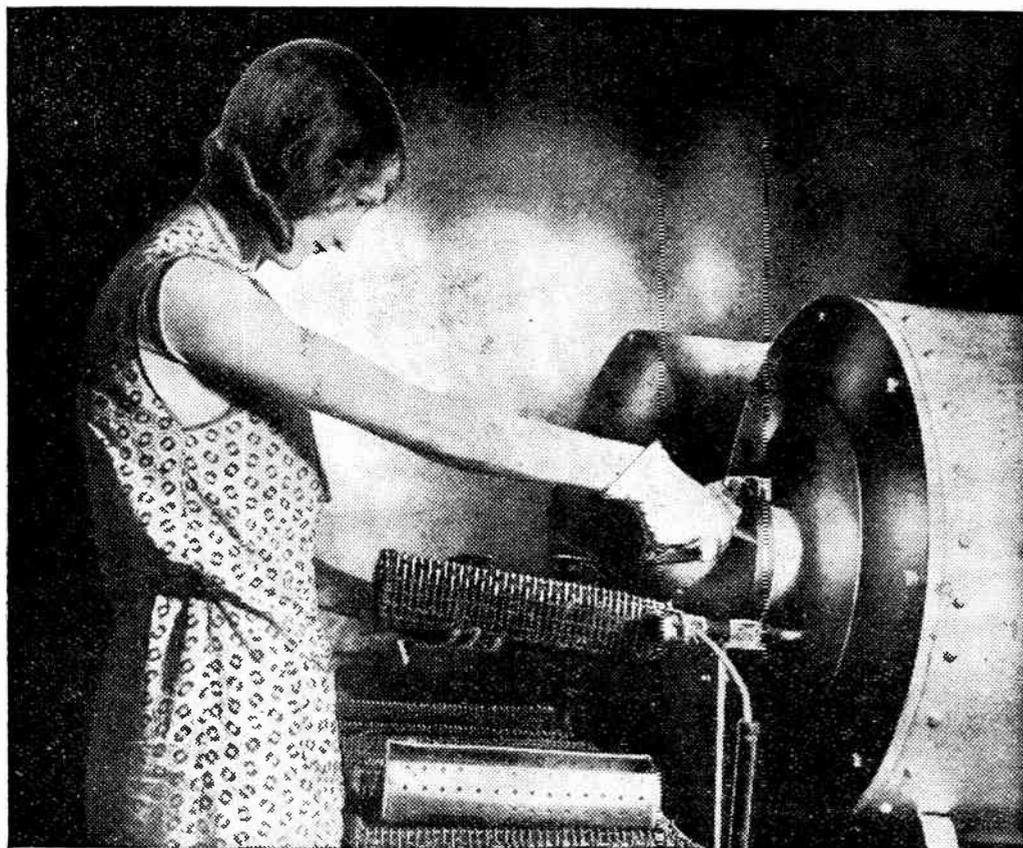
533 kc/s, 563 metres; 16 kW.—6.5 p.m., Weekly Lithuanian Review. 6.20, Miscellaneous Items. 6.25, Programme for Students. 6.40, Programme Announcements. 6.45, Programme from Warsaw. 7.0, Concert of Request Gramophone Music. 8.0 till Close Down, See Warsaw.

ZURICH.—See Schweizerischer Landessender.

# PRINCIPAL BROADCASTING STATIONS OF EUROPE

Arranged in Order of Wavelength

Metres.	kc's.	kW.	Station.	Tuning Positions.	Metres.	kc's.	kW.	Station.	Tuning Positions.
1935	155	7	Kaunas (Kovno) (Lithuania) .. .. .		388.1	815	0.7	Fredriksstad (Norway). (Relays Oslo)	
1538	160	8.5	Huizen (Holland) (Kootyck, 50kW., after 3.40 p.m.) (K.R.O. and N.C.R.V. programmes.)		384.1	824	1	Bergen (Norway) .. .. .	
1796	177	40	Lahti (Finland) .. .. .		363.6	825	13	Algiers (Algeria) .. .. .	
1725	174	75	Radio Paris, CFR .. .. .		360.6	832	60	Mühlacker (Stuttgart) (Germany) .. .. .	
1635	183.5	60	Berlin (Deutschlandsender) (Germany). (S.-W. Stn. DJA on 31.38 m., DJB on 19.73 m., DJC on 19.83 m., DJD on 25.51 m., DJE on 16.86 m.)		355.9	843	50	London Regional (Brookmans Park)	
1554.4	19	30	Daventry National .. .. .		352.1	852	7	Graz (Austria). (Relays Vienna)	
1538	195	7	Ankara (Angora) (Turkey) .. .. .		348.8	860	7.6	Barcelona, EAJI (Spain) .. .. .	
1481	202.5	500	Moscow, RV1 (Old Komintern) (Russia) .. .. .		348.8	860	10	Leningrad, RV70 (Russia) .. .. .	
1446	207.5	13	Eiffel Tower, FL, Paris .. .. .		345.2	860	11.5	Strasbourg, PTT (France) .. .. .	
1412	212.5	120	Warsaw I (Poland) .. .. .		341.7	878	35	Brno (Brunn) (Czechoslovakia) .. .. .	
1380	217.5	100	Novosibirsk, RV76 I (Russia) .. .. .		338.2	887	15	Brussels II Velthem (Belgium). (In Flemish)	
1354.4	221.5	30	Motala (Sweden). (Relays Stockholm)		335	896	5	Cadiz (Spain) .. .. .	
1304	230	100	Moscow, WZSPS (Trade Union) (Russia) .. .. .		334.4	897	1.9	Poznan (Poland) .. .. .	
1200	250	5	Stamboul (Turkey) .. .. .		331.5	905	50	Milan (Italy). (Relays Turin)	
1200	250	21	Reykjavik (Iceland) .. .. .		328.2	914	60	Poste Parisien (France) .. .. .	
1190	252	200	Luxembourg .. .. .		325	923	60	Breslau (Germany) .. .. .	
1170	256	25	Tashkent, RV11 (Russia) .. .. .		321.9	932	10	Göteborg (Sweden). (Relays Stockholm)	
1154	260	60	Kalundborg (Denmark). (Relays Copenhagen)		318.8	941	0.25	Dresden (Germany). (Relays Leipzig)	
1154	260	20	Monte Ceneri (Switzerland). (Temporarily closed.)		318.8	941	1.5	Naples, INA (Italy). (Relays Rome)	
1033	277	60	Moscow, Popoff RV58 (Russia) .. .. .		315.8	950	1.6	Marseilles, PTT (France)	
1071	280	35	Oslo (Norway) .. .. .		312.8	959	0.7	Radio Vitus (Paris). (S.-W. Stn. on 43.75 m.)	
1035	290	36	Tiflis, RV7 (Russia) .. .. .		312.8	959	1.7	Cracow (Poland) .. .. .	
1000	300	100	Kiev, RV9 (Russia) .. .. .		312.8	959	10	Genoa, IGE (Italy). (Relays Turin)	
938	320	20	Moscow RV39 (Russia). (S.-W. Stn. on 50 m.)		309.9	968	50	West Regional (Washford Cross) .. .. .	
857	350	100	Kharhov, RV4 (Russia) .. .. .		307	977	0.75	Zagreb (Yugoslavia) .. .. .	
840	357	18.5	Leningrad (Russia) .. .. .		304	986	13	Bordeaux Lafayette, PTT (France) .. .. .	
825	363.6	50	Budapest (Hungary) .. .. .		301.5	995	50	North National (Manchester) .. .. .	
760	395	1.3	Sverdlovsk, RV5 (Russia) .. .. .		298.8	1004	11	Tallinn (Estonia)	
720	416.6	20	Geneva (Switzerland). (Relays Sottens)		296.1	1013	20	Hilversum (Holland). (7 kW. before 4.40 p.m.) (F.A.R.A., A.V.R.O. and V.P.R.O. programmes.)	
690	434.6	1.5	Moscow, RV2 (Experimental) (Russia) .. .. .		293.5	1022	0.7	Limoges, PTT (France) .. .. .	
680	441.2	0.6	Oulu (Uleaborg) (Finland) .. .. .		293.5	1022	2.6	Kosice (Czechoslovakia) .. .. .	
574.7	522	7	Lausanne (Switzerland). (Relays Sottens)		291	1031	13.2	Viipuri (Viiborg) (Finland). (Relays Helsinki)	
568.1	528	2	Ljubljana (Yugoslavia) .. .. .		288.3	1040	50	Scottish National (Falkirk)	
566	530	1.5	Grenoble (France) .. .. .		288.3	1040	1	Bournemouth. (Relay Station)	
563	533	16	Hanover (Germany). (Relays Hamburg)		286	1049	0.8	Montpellier (France) .. .. .	
560	536	1.5	Wilno (Poland). (Relay Station) .. .. .		284.8	1053	0.7	Lyon (Radio-Lyon) (France)	
550	545	18.5	Kaiserslautern (Germany). (Relays Munich)		283.6	1058	0.5	German Relays (Berlin, Magdeburg, Stettin)	
542	554	10	Budapest No. 1 Lakihegy (Hungary)		283.6	1058	0.5	Innsbruck (Austria). (Relays Vienna)	
537.6	558	3	Sundsvall (Sweden). (Relays Stockholm)		282.2	1063	2	Lisbon CT 1AA (Portugal). (Short-wave Station on 31.25 m.)	
533	563	60	Palermo (Italy) .. .. .		281.2	1067	0.75	Copenhagen (Denmark) .. .. .	
525	571	15	Munich (Germany) .. .. .		278.8	1076	13.5	Bratislava (Czechoslovakia) .. .. .	
517.2	580	100	Riga (Latvia) .. .. .		276.5	1085	60	Heilsberg (Germany) .. .. .	
509	589	15	Vienna (Bisamberg) (Austria) .. .. .		273.7	1096	7	Turin (Italy) .. .. .	
500.8	599	20	Brussels No. 1, Velthem (Belgium). (In French)		271.5	1105	1.3	Rennes, PTT (France) .. .. .	
495.8	605	1.2	Florence, IFI (Italy) (Relays Turin)		269.8	1112	20	Bari (Italy) (Relays Rome)	
488.6	614	120	Tröndelag (Norway) .. .. .		269.8	1112	0.25	Bremen (Germany). (Relays Hamburg)	
480	625	50	Prague (Czechoslovakia) .. .. .		267.6	1121	0.75	Valencia (Spain) .. .. .	
472.4	635	60	North Regional (Manchester) .. .. .		267.4	1122	6.25	Nvirghaza (Hungary). (Relays Budapest)	
465.8	644	1.5	Langenberg (Germany) .. .. .		265.8	1128.5	1.3	Lille, PTT (France)	
459.4	653	60	Lyons la Doua, PTT (France) .. .. .		263.8	1137	11.2	Moravska Ostrava (Czechoslovakia) .. .. .	
453.2	662	0.25	Beromünster (Schweizerischer Landessender) (Switzerland).		261.5	1147	50	London National and West National	
453.2	662	4	San Sebastian, EAJ8 (0.6 kW.): Pori (1.0 kW.) (Finland); Danzig (0.5 kW.) (relays Heilsberg); Klagenfurt (0.5 kW.) (Austria) (relays Vienna).		259.3	1157	17	Frankfurt-a.-M. (Germany)	
450.3	666	20	Agen (France) .. .. .		259.3	1157	2.3	Trier (Germany). (Relays Frankfurt)	
447.1	671	7	Milan (Vigentino) (Italy). (Relays Rome)		257.1	1167	10	Hörby (Sweden). (Relays Stockholm)	
441.2	680	50	Madona (Latvia). (Relays Riga) .. .. .		255.1	1176	0.7	Toulouse, PTT (France)	
435.4	689	55	Paris, Ecole Supérieure, PTT .. .. .		253.1	1185	5	Gleiwitz (Germany). (Relays Breslau)	
430.4	697	2.5	Rome, IRO. (S.-W. Station, 2RO on 25.4 m.)		252	1193	1	Barcelona, EAJ15 (Assoc. Nat.) (Spain)	
424.3	707	2	Stockholm, SASA (Sweden) .. .. .		249.6	1202	0.8	Juan-les-Pins, Nice (France) .. .. .	
424.3	707	100	Belgrade (Yugoslavia) .. .. .		247.7	1211	10	Trieste (Italy). (Relays Turin)	
419.5	715	1.5	Madrid, EAJ7 (Union Radio)		245.9	1220		Berne (0.5kW.) (Switzerland) (relays Beromünster); Eskilstuna (0.2kW.), Säfte (0.4 kW.) (Sweden) (relays Stockholm); Cassel (0.25 kW.) (Germany) (relays Frankfurt); Linz (0.5 kW.) (Austria) (relays Vienna); Pietarsaari (0.5 kW.); Turku (Abo) (0.5 kW.) (Finland) (relays Helsinki).	
408.7	734	16	Moscow, Inini Stalina (Russia) .. .. .		244.1	1229	0.5	Basle (Switzerland). (Relays Beromünster)	
403.8	743	25	Berlin, Funkstunde (Germany) .. .. .		242.3	1238	1	Belfast (N. Ireland) .. .. .	
398.9	752	25	Rabat (Morocco) .. .. .		240.6	1247	0.5	Stavanger (Norway) .. .. .	
394.2	761	12	Athlone (Irish Free State) .. .. .		238.9	1256	2	Nürnberg (Germany). (Relays Munich)	
389.6	770	120	Katowitz (Poland) .. .. .		237.2	1265	1	Nimes (France) .. .. .	
385.1	779	8	Sottens (Radio Suisse Romande) (Switzerland)		237.2	1265	3	Bordeaux, Sud-Ouest (France) .. .. .	
381	788	16	Midland Regional (Daventry) .. .. .		235.5	1274	0.5	Kristiansand (Norway) .. .. .	
376.4	797	50	Bueharest (Roumania) .. .. .		235	1283	1.65	Lodz (Poland). (Relay Station)	
372.2	806	1.5	Leipzig (Germany) .. .. .		232.2	1292	0.25	Kiel (Germany). (Relays Hamburg)	
370.1	810.5	0.8	Toulouse (Radiophonie du Midi) (France)		227.4	1319	0.5	Flensburg (Germany). (Relays Hamburg)	
368.1	815		Stalino, RV26 (Russia) .. .. .		225.9	1328	10	Fécamp, Radio-Normandie (France)	
			Lwow (Lemberg) (Poland) .. .. .		224.4	1337	1	Cork (Irish Free State) .. .. .	
			Scottish Regional (Falkirk) .. .. .		219.9	1365	1.5	Béziers (France) .. .. .	
			Hamburg (Germany) .. .. .		218.5	1373	0.2	Plymouth .. .. .	
			Radio, L.L. Paris .. .. .		218.5	1373	0.5	Salzburg (Austria). (Relays Vienna)	
			Seville, EAJ5 (Union Radio) (1.0 kW.): Galicia EAJ1 (0.2 kW.) (Spain); Bolzano (1.0 kW.) (Italy); Helsinki (10 kW.) (Finland) (relays Lahti); Khabarkov, RV20 (10kW) (Russia).		217	1382	0.5	Königsberg (East Prussia). (Relays Heilsberg)	
					217	1382	0.25	Karlstad (Sweden) .. .. .	
					214.3	1400	1	Aberdeen .. .. .	
					211.3	1420	1	Newcastle .. .. .	
					209.8	1430	1.25	Magyarovar, Miskolc and Pecs (Hungary) .. .. .	



# 1,000 Degrees Centigrade

There's more—much more—in the manufacture of Cossor Valves than meets the eye. Consider for a moment the nickel anodes. Any impurities in the metal—even minute traces of gaseous matter—might, at a later date, impair the efficiency of the valve. Each one, therefore, is subjected to intense heat in an electric furnace, in an atmosphere of hydrogen, to drive off all impurities. Here is a process which is unseen by the public. Many in fact might consider it an elaborate—and rather unnecessary precaution. Yet it is but one of many similar processes devised by Cossor engineers to safeguard a reputation of which they are justifiably proud. When you buy a Cossor Valve you can be certain that no expense has been spared—that nothing has been left undone—to make sure that it will give you long and dependable service.

*that you may  
enjoy **BETTER**  
Radio Reception*



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# Practical HINTS and TIPS

## AIDS TO BETTER RECEPTION

MORE often than not, a gramophone pick-up is connected to the detector valve grid in the manner shown in Fig. 1. A consideration of this diagram will show that, as the volume-control potentiometer setting is varied from maximum to minimum, the value of resistance shunted across the grid circuit is similarly changed.

### Testing the Vacuum

It may not have occurred to many readers that, if a milliammeter be connected in series with the anode as shown, we have in this arrangement an effective tester for "softness," or deficient vacuum of the valve.

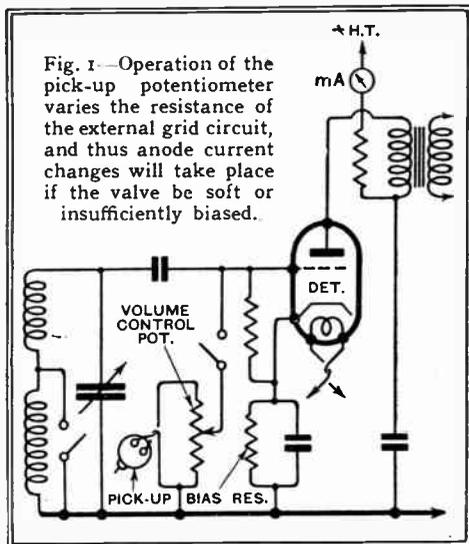


Fig. 1.—Operation of the pick-up potentiometer varies the resistance of the external grid circuit, and thus anode current changes will take place if the valve be soft or insufficiently biased.

If any appreciable change in anode current is produced by operation of the volume control potentiometer, it can be assumed that either "positive" or "negative" grid current is flowing. Provided that sufficient negative bias be applied, "positive" grid current cannot flow; accordingly, if operating conditions are correct, any change in anode current is a definite indication of a "soft" valve.

Any valve other than the detector, provided it operates at the same heater or filament voltage, may generally be inserted temporarily in the detector socket for purposes of test.

IT is useful to know that the latest type of combined detector-oscillator valve—the so-called Pentagrid or Heptode—may be tested, so far as the oscillator section is concerned, in much the same way as when a separate valve is employed for the latter function.

### Testing Pentagrid Oscillators

To make a definite test, a milliammeter should be joined in series with the oscillator anode, preferably on the low-potential side of the feed resistance. Then, with the aerial disconnected and no signal coming in, the oscillator reaction coil

should be short-circuited, and if all is in order a rise in current should take place.

If there be no change in current we have a certain indication of non-oscillation, under which conditions the set cannot possibly function. This test should be carried out on several wavelengths.

In testing the "New Monodial Super" the meter should be connected on the "earthy" side of the resistance R<sub>5</sub>, while the experimental short-circuit should be applied between Terminal No. 1 of the oscillator coil assembly and earth.

EVERYONE knows that the effectiveness of an aerial is, apart from the question of height, more or less proportional to its length. But this only holds good if the horizontal span be straight; occasionally one sees indoor aerials which

### Indoor Aerials

could be definitely improved by shortening them. For instance, the aerial is sometimes carried round three sides of a room, or even of a narrow hall, the lead-in being taken down from one end; with such an arrangement it is to be expected that the voltage introduced into one side will partially neutralise that in the other, and so the effective length will be actually less than if the aerial were carried along one side of the room.

The design of indoor aerials is hardly susceptible to scientific treatment, but it is always worth while to make a few careful comparative tests before installing a permanent arrangement.

IT sometimes happens that the output from the detector valve is insufficient fully to load the output valve, and so the fitting of an intermediate L.F. stage becomes necessary. As often as not the amplification needed from this stage is quite small—perhaps not more than four or five times.

### Low-amplification Intermediate Stages

Provided that an input volume control to the L.F. amplifier be fitted, it does not greatly matter if the intermediate stage be of the conventional high-gain type, giving much greater amplification than is needed. But there is another aspect of the subject that should sometimes be taken into account; the use of excessive magnification tends to increase hum, and to provoke L.F. instability. There is accordingly much to be said in favour of using no more amplification than is strictly necessary; this will often be obtainable from a small power valve coupled by means of a resistance of low value (20,000 ohms or less) to the succeeding output valve.

IT is useful to remember that, from many points of view, the anode circuit of an amplifying valve and the grid circuit of the succeeding valve are identical. With any "one-to-one" coupling, such as choke or resistance, the signal-frequency voltages existing across each circuit are bound to be of almost the same value.

### Grid and Anode Circuits

This point may not be immediately apparent from Fig. 2 (a), which represents an ordinary resistance-coupled L.F. stage drawn in the conventional manner. But, by redrawing the amplifier as in diagram (b), it is made clear that anode and grid circuits, linked by a coupling condenser, are in parallel.

All this applies to the H.F. side of the receiver as well as to the L.F. amplifier. The knowledge that these circuits, which appear to be independent, are really in parallel with one another, may often be turned to good account when testing for faults. For instance, when locating hum or intermittent cracklings in a receiver employing the L.F. circuit used as an example, the effect of an experimental short-circuit across either the anode resistance or grid-lead would be almost identi-

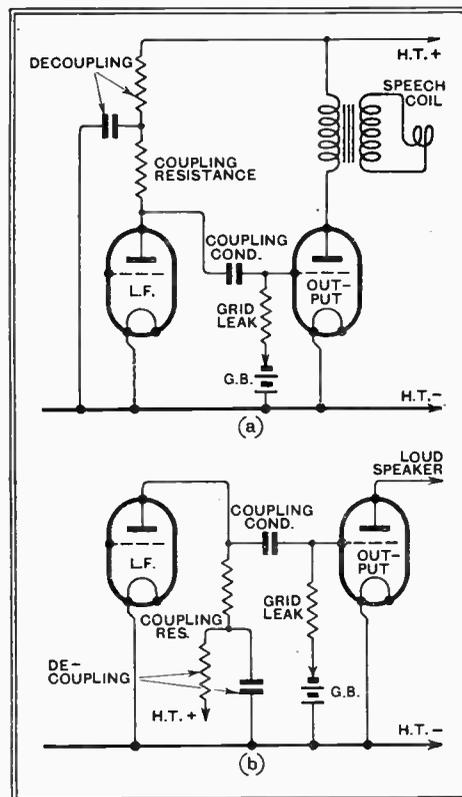


Fig. 2.—The circuit of a conventional resistance-coupled stage is redrawn in diagram (b) to show that grid and anode circuits are in parallel from the signal-frequency point of view.

cal. When one happens to be inaccessible, connection might be made to the other.

# Radio Luxembourg

## An International Broadcasting Problem

**R**ADIO LUXEMBOURG started some months ago with regular experimental transmissions. These broadcasts are still taking place. To the casual observer they do not bear the mark of "experimental." Luxembourg describes these transmissions as experimental because this station dares not start broadcasting officially on its present wavelength, as this lies in a band reserved for non-public services and can only be used by broadcasting stations after sanction by the countries concerned, and this sanction is lacking. Great Britain has taken a very decided stand against the opening of Radio Luxembourg and also against this station's idea of becoming an international broadcaster. Reasons given are that it would be interfering with the authority of a foreign Government to broadcast, from Luxembourg, programmes addressed to countries outside Luxembourg. Certain Governments in Europe are afraid that a precedent might be created and their carefully built up control of their own broadcasting rendered useless. France and Belgium, on the other hand, are all for the international broadcasting station in Luxembourg, so that when, some time ago, a British protest against Luxembourg was made a few hours later steps were taken by France and Belgium in the opposite direction.

### A Finely Equipped Station

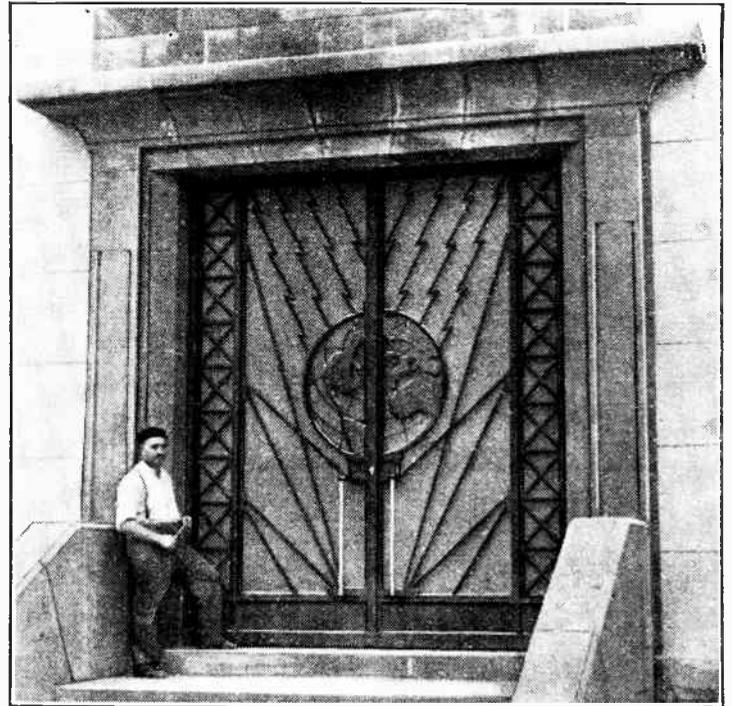
The visitor to Radio Luxembourg finds one of Europe's most beautifully laid out broadcasting transmitters working with 200 kW. in the aerial and ample space provided for the addition of a powerful short-wave transmitter. The typical long-wave aerial of the present station still stands, and at the beginning of September there were no signs of any possible changes to adapt the transmitter to the medium wavelength prescribed for it under the Lucerne Plan. In Luxembourg itself a series of beautiful new



**MULTI-LINGUAL BROADCASTING.**—Léon Moulin, the Luxembourg patois announcer, sharing the microphone with Eva Siewert, who announces in German.

studios have just been completed. Plans are prepared for the building of a large concert hall to act as a studio as well, and a small orchestra has been engaged. There are permanent announcers for French and German and for the Luxembourg patois, and occasional announcers for Italian, Spanish, Dutch, and English. Luxembourg broad-

**AN AIR OF PERMANENCY** attaches to this view of the massive main entrance door to the Luxembourg transmitter building. Note the design, which suggests that Luxembourg will encircle the world with its new short-wave transmitter.



casting programmes are arranged for a different country each evening. The idea is that Luxembourg, once it has received international sanction, should start broadcasting sponsored programmes for various European countries. In Germany a company was formed some time ago, with the co-operation of the German Post Office and of the semi-official Wolff News Agency, to act as official agent for the selling of Luxembourg "air space" in Germany.

The answer to "What will happen to Luxembourg after January 15th?" is intimately related to the question, "Will the Lucerne Plan come into force on that day?" At the present moment Holland, Sweden, Lithuania, Finland, Poland, Hungary, Greece, and Luxembourg have not adhered to the Lucerne conditions. It is generally understood that attempts are being made during the meeting of the International Union of Broadcasters, which is taking place during this week at Amsterdam (at the invitation of the Dutch broadcasters), to bring these countries into line. This seems a very difficult problem at the present moment, as the main bone of contention is the long waves.

### Where the U.I.R. is Powerless

We are inclined to attach much importance to the Union Internationale de Radio-diffusion, but this body is the official expert to the International Union of the Postal Administrations of Europe in all matters regarding broadcasting, and no more. There are even members of the Broadcasters' Union who at one time hoped that they would have authority to arbitrate in cases where any broadcasting station might start direct propaganda against the existing Government in a neighbouring country. These hopes have long since been shattered, and it is therefore excusable to ask why the International Broadcasting Union should pass a resolution against Luxembourg whilst no such action is taken against larger countries which are similarly offending.

At the Amsterdam meeting the U.I.R. has, in its technical committee, had to discuss ways and means of putting the Lucerne

Plan into practice. The committee dealing with legal aspects is, no doubt, studying the problem of what will happen if the Lucerne Plan is not signed by the eight outstanding countries. Their deliberations may bring us closer to a solution of the wavelength problem and international broadcasting as exemplified by Luxembourg, but whether they can tackle political and unfriendly broadcasting is another matter.

I understand that most European postal administrations sent non-participating representation to Amsterdam, as they did not wish that Lucerne should have the same fate as the North and Central American wavelength conference, which has just failed to reach an agreement.

"WANDERING WAVE."

### BLUE PRINTS

For the convenience of constructors full-sized blue prints are available of the following popular *Wireless World* sets that have been recently described, price 1s. 6d., post free.

**Short Wave Two.** (November 4th and December 23rd, 1932.)

**Monodial D.C. Super.** (December 2nd and 9th, 1932.)

**Straight Three.** (December 16th, 1932.)

**Modern D.C. Threc.** (December 30th, 1932, and January 6th, 1933.)

**All-wave Monodial Super.** (January 27th and February 10th, 1933.)

**Modern A.C. Quality Amplifier.** (February 17th, 1933.)

**Ferrocort III.** (February 24th and March 3rd, 1933.)

**The Class "B" Ferrocort Receiver.** (April 17th, 1933.)

**Universal A.C. Short-wave Converter.** (April 28th, 1933.)

**New Monodial Super.** (July 21st and 28th, 1933.)

**Modern Battery Four.** (August 11th, 1933.)

**D.C. Superhet.** (September 29th, and October 6th, 1933.)

These can be obtained from the Publishers, Iliffe & Sons Ltd., Dorset House, Stamford Street, London, S.E.1.

# Visual Tuning Indicator

## Practical Notes on the Micromesh "Tunograph"

THE tuning of a receiver fitted with A.V.C. is apt to be more difficult than that of a set not so equipped, for the automatic volume control appears to flatten the tuning, and a precise setting for optimum signal strength cannot readily be distinguished. It is the usual practice, therefore, to tune a receiver of this type for minimum background hiss, or for the best quality of reproduction, instead of for maximum signal strength. There is no real difficulty in this, once the operation has become familiar, and after a little practice it is quite possible to tune as accurately as with the aid of an indicator.

There is no doubt, however, that a visual tuning indicator is a help, particularly when the receiver is to be handled by unskilled members of the family. Various methods of visual tuning are possible, but methods depending upon the movement of a light or a shadow are probably the most popular. The Micromesh "Tunograph" comes under the former of these headings, for the position of a spot of light on a screen is made to vary with the strength of the signal.

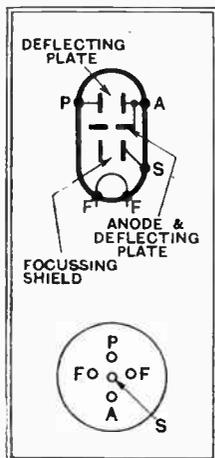


Fig. 1.—The electrode arrangement and base connections of the "Tunograph."

the deflecting plates until it finally strikes a fluorescent screen mounted at the upper end of the bulb. One focussing plate is connected internally to the anode, and the other is available for external connection. If both are maintained at the same potential, the beam of electrons strikes the screen at the extreme right-hand side, with the tube mounted vertically, and gives the characteristic green spot of a cathode-ray tube.

If the free focussing plate be now biased negatively with respect to the other, the spot of light moves towards the left by an amount which depends upon the bias, and some 40 volts is needed to bring it to the extreme left-hand side of the screen. In practice, therefore, the change

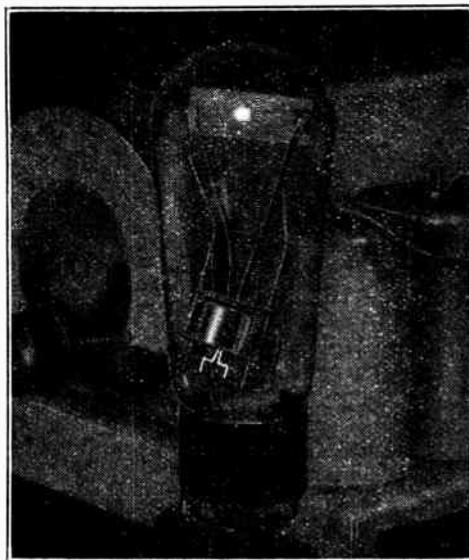
of anode current with grid bias on a controlled valve is made to deflect the spot of light, and, since the change of current increases with signal strength, the deflection of the spot is greatest for a strong signal.

The indicator is not confined to an arrangement of this nature, however, for, being practically free from inertia, the electron beam can follow the alternating signal potentials. If the deflecting plates be maintained at the same steady potential, therefore, in the absence of a signal, the spot of light will appear at the right-hand side of the screen. The application of signal potentials between the plates will then cause the spot of light to vibrate backwards and forwards in a straight line, with the visible result of a line of light the length of which is dependent upon the strength of the applied signal.

### Line Indication

The circuit connections for this arrangement are shown in Fig. 2, and it will be seen that the "Tunograph" is connected across the last tuned circuit of the receiver. Since the tube has a certain capacity, this circuit will require retrimming after fitting the indicator, but this should present little difficulty. It will be found that the line of light spreads to the left with increasing signal strength, and tuning is carried out for maximum length of line.

This method of indication, while very



The "Tunograph" indicator, showing the light spot on the screen. As the tuning is varied to bring the set into resonance with the signal, the light spot moves to the right.

attractive from some points of view, is open to two objections in practice. In the first place, a very strong signal is necessary to give any decided line, about

13 volts for a length of 1 cm., and very few receivers are designed to operate with a detector input greater than one-tenth of this. Secondly, there is a reduction in visibility when the spot spreads out into a line, and on a very strong signal the line itself may be barely visible, and it is possible to see only a faint line with a blob at each end.

### Spot Tuning

For general use, therefore, the alternative circuit, Fig. 3, is preferable, although

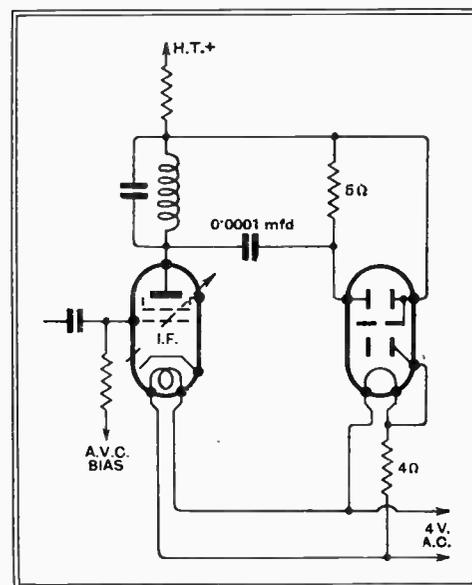


Fig. 2.—The connections for a line indication are shown here, and it will be observed that the "Tunograph" is fed from the last H.F. or I.F. tuned circuit.

this necessitates slightly more alteration to the set. A resistance of some 10,000 ohms must be included in the anode circuit of one of the controlled valves. The anode of the "Tunograph" is connected to the positive H.T. side of this, and the free deflecting plate to the other. Assuming an anode current with no signal of 4 mA., the free deflecting plate is then biased negatively with respect to the other plate by 40 volts, so that the spot of light comes to rest at the extreme left-hand side of the screen. When a signal is tuned in, and A.V.C. comes into action, the anode current of the controlled valve drops by an amount which is dependent upon the signal strength, with the result that the voltage drop across the 10,000 ohms resistance falls proportionately, and the free deflecting plate becomes less negatively biased, so that the spot of light moves to the right. Tuning, therefore, is carried out for a maximum movement of the spot of light.

The disadvantage of this method, when the tube is to be fitted to an existing set, is that the necessity for including a re-

**Visual Tuning Indicator—**

sistance in the controlled valve anode circuit means that its anode voltage is reduced. The value of 10,000/20,000 ohms marked on the circuit diagram is suggested by the makers; it will, however, obviously depend upon the type of valve used. Since, with no signal, a voltage drop across it of 40 volts is required, 10,000 ohms is correct for a valve taking 4 mA., and 20,000 ohms for one taking 2 mA. Some variable-mu valves, however, require 8 mA., and then the requirements are met by a resistance of 5,000 ohms. In practice, the resistance value is best determined by selecting a value such that with no signal the spot of light settles at the extreme left of the screen. When adding the indicator to a set, it will probably be best included in the anode circuit of the earliest controlled valve, for the reduction of 40 volts in its H.T. supply will probably be least felt here.

The anode potential of the "Tunograph" must be at least 180 volts, and care should be taken to see that the mains transformer is capable of supplying an additional ampere of current for the filament without an excessive drop in heater voltage on the valves. Since the filament

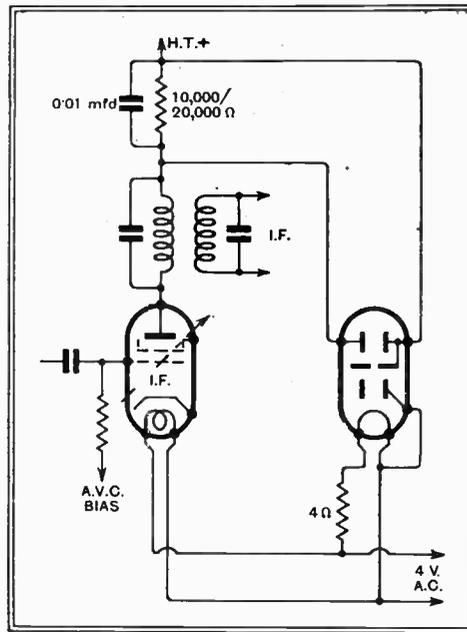


Fig. 3.—With these connections, the position of the light spot varies with the bias on the controlled valve, and hence with signal strength.

of the indicator is rated for only 0.5/0.6 volt, it must be run from the 4-volts A.C.

lines through a 4-ohms resistance rated to carry one ampere.

It should be noted that the spot of light is not readily visible in a bright light unless the tube be enclosed in a light-proof box with a viewing window. It is suggested that the tube be mounted inside the cabinet in any convenient position and a small hole cut in a suitable position on the panel for viewing. In general, it will be best to mount the tube horizontally, with the left-hand side of the plate at the bottom when using a spot indication, and the right-hand side at the bottom when using a line indication, for the spot or line will then move vertically on tuning in a signal, and the operation of tuning will be carried out for maximum height of spot or line.

It should be pointed out that the spot can be deflected by external magnetic or electrostatic fields, and a small deflection will be observed on touching the glass bulb with the finger, due to the dissipation of the charge which accumulates on the glass. It is not improbable, therefore, that the spot might move right off the screen if the tube be mounted in close proximity to a loud speaker, mains transformer, or smoothing choke.

# News of the Week

## Current Events in Brief Review

### Despite the Depression

NEW ZEALAND receiving licences have now reached the 100,000 mark.

### An Acoustic "Find"

VIENNA'S finest studio from an acoustical point of view is the small hall of the Municipal Concert Building. This has been hired by the broadcasting company for use at frequent intervals for important musical programmes.

### Medium Wave Freaks

AMONG letters reporting reception received by the Brussels broadcasting stations have been reports from members of the New Zealand DX Club. It is also interesting to note that Athlone has been picked up by the same club.

### Good News for Dealers

WIRELESS dealers need have no scruples in giving public demonstrations on loud speakers, despite the decision of the Court of Appeal that the public reproduction of broadcast music is an infringement of the composer's copyright. In a statement made last week, Mr. C. F. James, General Manager of the Performing Rights Society, said that the Society did not contemplate any departure from the policy hitherto followed in the matter of performances given in dealers' shops solely for the purpose of demonstrating wireless apparatus with a view to sale.

These performances, said Mr. James, were "public" for the purpose of the Copyright Act, but the Society had never concerned itself with cases of this kind and did not propose to do so now.

### Changes at Munich

THE Munich high-power transmitter is to close down temporarily for constructional changes made necessary by the adoption of a new wavelength and an increase in power from 60 to 100 kW. Until January 15th next the old Munich 1.5 kW. transmitter at Stadelheim will be used.

### No Pompous Oratory

ACCORDING to an interview given by M. Laurant-Eynac, the French Postmaster-General, politics will be absent in the new French broadcasting scheme.

"Polemics are out of place," said the P.M.G., "in programmes intended for the world; we shall seek a broadcasting style without pompous oratory."

Merciless war will be waged on man-made static, and by the end of November anti-interference devices will become compulsory.

### Graceful Tribute from U.S.

"Q.S.T." the American amateur journal, is high in its praises of the experimenters, Messrs. O'Heffernan and Myatt, who secured the world's record for ultra-short wave communication when the former transmitted from the top of Snowdon in August last, and was heard at Hoddesdon on a *Wireless World* "Ultra S.W. Two," 200 miles away.

"If any U.S. amateur has done comparable DX from such an altitude," says "Q.S.T.," "we have yet to hear about it. Even our honest-to-goodness mountains have yet to notice such things happening around them."

### Stage v. Studio

THE traditional warfare between broadcasting and the theatre assumes a new complexion with the news from Prague of an enterprising theatrical manager there, who, hearing an unusually good bass broadcasting from Warsaw, "stole" him for the purpose of his next production.

### Tokio Listeners Aid Air Force

BROADCAST listeners were asked to participate in the recent aerial manoeuvres at Tokio. They were formally requested to intercept the planes' signals on their loud speakers as the squadrons passed overhead and to convey these messages "by all possible means" to headquarters.

### Slower Wireless Waves?

TESTS on the actual speed of wireless waves have just been completed by MM. Stoyko and Jouanet, of the Paris Academy of Science. Despite the theoretical assumption that the wireless wave, having the same speed as that of light, travels at a rate of 300,000 km./sec., the French scientists have discovered that short waves travelling between Buenos Aires and Paris have a speed of only 270,000 km./sec. The difference of ten per cent between the theoretical and practical values may be explained by the number of reflections which the waves undergo, which would tend to lengthen the distance covered and slow down the wave. Long waves, the scientists state, travel at the speed of only 245,000 km./sec.

### The Three Best

DURING the past year Belgium has registered the third highest percentage amount of listeners to density of population, her figure of 69.3 per thousand being exceeded only by Spain (108.3) and Greece (72.3). There are now in Belgium 409,000 French and Flemish-speaking listeners.

### Superhet as "Also Ran"

THE Copenhagen Radio Exhibition opened with a startling declaration by the Danish Premier, M. Stauning, that the Lucerne Conference had been a failure.

As to the exhibition itself, our Danish correspondent reports that the superheterodyne receiver was not nearly so popular in Northern Europe as it appears to be in the south. Straight receivers were much in evidence, the most popular being three- and four-valve arrangements. Many British sets and components were displayed.

### Banning the "Gyp"

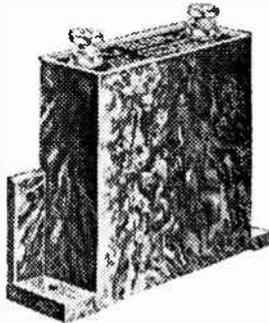
ONE of the by-products of America's National Recovery movement will be the elimination of the so-called "Gyp" radio service men, and those who will take their place are being organised to outlaw "the vulturous class" with which the radio service field is infested.

Among the unfair practices the new code will ban are: Stealing good radio valves and replacing them with damaged ones; malicious destruction of equipment under inspection to create additional work or justify charges; use of radio service as a pretext for gaining entry into a home for illegitimate purposes; charging for services not rendered; and, finally, misrepresentation of ability.

# TELSEN

PAPER MICA and ELECTROLYTIC

# CONDENSERS



### TELSEN PAPER CONDENSERS

Subjected to rigorous tests up to Post Office and Admiralty standards, the exclusive method of construction making them genuinely non-inductive. They give the highest insulation with complete freedom from breakdown—built for lasting efficiency under all conditions. Specially designed for 2-way fixing.

Cap. mfd.	500 Volt Test	1,000 Volt Test	Cap. mfd.	500 Volt Test	1,000 Volt Test
.01	1/3	1/9	.5	1/6	2/-
.04	1/3	1/9	1	1/9	2/6
.1	1/6	2/-	2	2/6	3/6
.25	1/6	2/-			

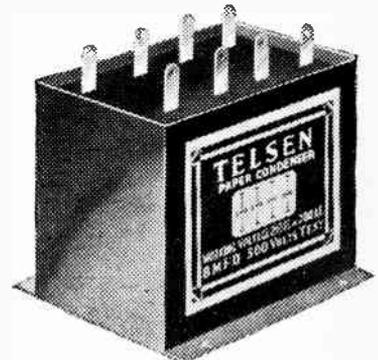


### TELSEN High Voltage Dry ELECTROLYTIC CONDENSERS

An outstanding achievement in condenser design.

Excellent for use in smoothing circuits and other positions in which high voltage high capacity condensers are required. The special bracket and terminal supplied with the condenser enables it to be mounted on any type of baseboard or chassis.

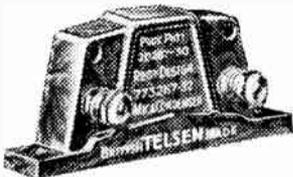
Cap.	275 working peak voltage	
4 mfd.	-	3/6
6 "	-	3/9
8 "	-	4/-
Cap.	500 working peak voltage	
4 mfd.	-	4/6
6 "	-	5/-
8 "	-	5/6



### TELSEN PAPER BLOCK CONDENSERS

Represent a definite advance in current condenser practice. In metal cases with soldering tags.

Cap. mfd.	500 Volt Test	1,000 Volt Test
4	4/9	6/6
6	7/-	9/6
8	9/6	



### TELSEN MICA CONDENSERS

Adaptable to flat and vertical mounting. H.F. losses, even in the larger sizes, have been virtually eliminated. Grid leak clips supplied free with the smaller capacities. In capacities of from .0001 mfd. to .001 mfd. 6D.

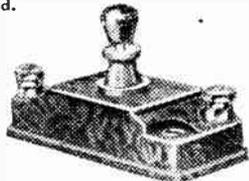
.002 - 1/- .006 - 1/3



### TELSEN TAG CONDENSERS

Of compact and sturdy construction. May be mounted on either insulated or metal panels. Tags enable the condensers to be connected to any other components, either directly or by soldering. H.F. losses are negligible. In capacities of .0001 mfd. to .001 mfd. 4 1/2 D.

.002 mfd. 6d.



### TELSEN PRE-SET CONDENSERS

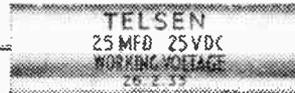
Give widest variation between maximum and minimum capacities, and exceptional range of selectivity adjustment when used in the aerial circuit. High insulation with low loss. In mfd. capacities of from .0001 to .002. 1/3



### TELSEN RESISTORS WITH WIRED ENDS

Very small and light, and easily suspended in the wiring of a receiver. Supplied in the following values—Power rating of 1/2 and 1 watt: 250, 500, 1,000, 1,250, 5,000, 10,000, 20,000, 25,000, 50,000, 100,000, 250,000, 500,000 ohms. resistance. Price 1/-

Power rating of two watts: 250, 500, 1,000, 1,250, 5,000, 10,000, 20,000, 25,000, 50,000, 100,000 ohms resistance. Price 2/-



### TELSEN Low Voltage ELECTROLYTIC CONDENSERS

Ideal where a very high capacity with a fairly low voltage is required, as in automatic bias circuits for L.F. valves. Very compact, with wired ends for easy suspension in the wiring.

25 mfd. at 25 volts	-	2/6
50 " at 25 "	-	3/-
25 " at 50 "	-	3/-

### TELSEN SMALL TUBULAR CONDENSERS

Very small yet highly efficient, with wired ends for easy suspension in the wiring.

Cap.	Price	Cap.	Price
.0001 mfd.	1/-	.002 mfd.	1/-
.0002 "	1/-	.005 "	1/-
.0003 "	1/-	.006 "	1/-
.0005 "	1/-	.01 "	1/3
.001 "	1/-	.1 "	1/6

## TELSEN FOR EVERYTHING IN RADIO

ANNOUNCEMENT OF THE TELSEN ELECTRIC CO., LTD., ASTON, BIRMINGHAM

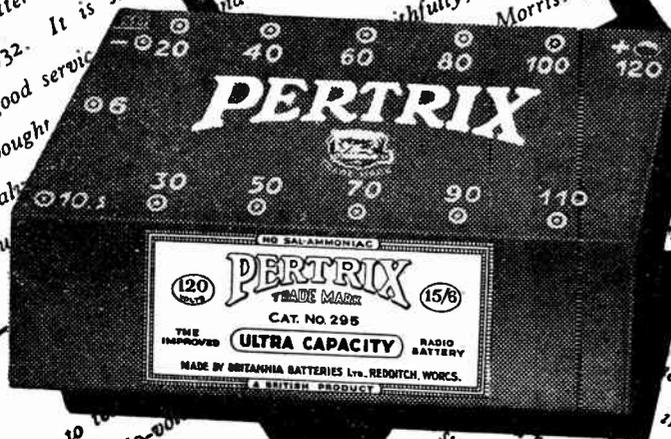
Advertisements for "The Wireless World" are only accepted from firms we believe to be thoroughly reliable.

Aug. 15, 1933.  
Dear Sirs,  
It may interest you  
know I have had a "Pertrix"  
100 volt battery Bat. No. 272,  
in continual use, on a two-valve  
set, since November 1931 until  
now. I have replaced it with  
one of your 120 volt batteries,  
and am anticipating equally good  
results.  
Yours faithfully,  
Morris.

Newcastle.  
Dear Sir, Mar. 1, 1933.  
On February 1st, 1932,  
I bought a Pertrix—100 V Sup  
Capacity H.T. Battery, for a  
three-valve S.G. set, and now for  
time in 13 months it is  
show signs of age.  
Really remarkable  
Battery,

West Hove, Suss.  
Feb. 11, 1933.  
I purchased on the  
2nd, a Pertrix 120 V  
It is now exact.  
the battery was  
in. Reception is  
in spite of the  
year's hard wear.  
Such as a Pertrix, could success-  
fully withstand such a severe test.  
I am, yours sincerely,  
Albert E. Burrows.

25, 1933  
Dear Sirs,  
I am writing to  
I am using one of your 60-  
High tension batteries on a 3-  
valve wireless for this last 2 years  
and it is working my set.  
I have spoken to my friends  
about the wonderful battery we  
have and they think it marvellous.  
Yours truly,  
G. Madin.



# Why do Pertrix Batteries last so long?

**L**ETTERS like those above keep rolling in. Users tell us *how* their Pertrix Batteries have lasted—let us tell you *why*.

Pertrix Batteries use a neutral electrolyte which is patent to Pertrix alone, which conserves the inside of the battery—there is no 'shorting' between the cells—there are no resistance crystals formed. You can listen every day or only once a week—your Pertrix will give the same hours of service: a Pertrix Battery does not waste away when the set isn't working, in fact it gathers power for the next time its service will be needed.

For keeping your set in good voice, fit a Pertrix—the Battery that keeps on keeping on. There's a Pertrix to fit every set; and for tireless

**FIT**

# PERTRIX

TRADE MARK

Low Tension work, fit a Pertrix Accumulator.

**FOR GOOD**

BRITISH MADE BY BRITANNIA BATTERIES LIMITED, 233, SHAFTESBURY AVE., LONDON, W.C.2

Mention of "The Wireless World," when writing to advertisers, will ensure prompt attention.

# BROADCAST BREVITIES

By Our Special Correspondent

## Private Line

THE private telephone line between Broadcasting House and the H.M.V. studio at St. John's Wood has proved very useful of late, not only for the preparation of records of B.B.C. studio performances and recitals on the Concert Hall organ, but in the making of the new form of "trailer" which Mr. Val Gielgud resorted to in presenting his talk on "Radio Drama" the other day.

## The Radio "Trailer"

Mr. Gielgud was copying film methods when he gave us a vivid minute taken from a forthcoming radio thriller; in other words, he gave us a trailer, as the film folks call such episodes, which was actually recorded by H.M.V. and broadcast from the gramophone record specially for the occasion.

The episode was acted at Broadcasting House and was recorded over the H.M.V. land line.

## Droitwich Testing Next Spring

THE mast riggers' strike notwithstanding, the B.B.C. hope to have the Droitwich transmitter testing next spring. It has now been decided that the two 700ft. masts shall sustain a single "T" aerial.

## The Post Office Will Oblige

As I predicted a few weeks ago, the available power will be far in excess of the nominal 100 kW., though this is the maximum for which the station will be licensed. However, as is known by those who have had any dealings with the General Post Office headquarters staff, these officials can be very accommodating in matters of this kind, and I do not doubt that, if circumstances require it, the B.B.C. will be granted permission to use a greater aerial output.

A power of 100 kW. will seem small next year if the present plans of many of the European stations come to maturity.

## Good-bye to "No. 10"

IT is now fairly definite that the New Year will see the closing down of the Wharf Studio, "No. 10." The alterations to Waterloo Bridge will involve so much noise that the programmes are likely to be interfered with; moreover, there are other reasons to bring about the B.B.C.'s departure.

## Skating Rink?

In all likelihood the Corporation will then resort to the skating rink in Delaware Road, Maida Vale, to which first reference was made in these columns on September 1st last, when an exclusive photograph of the suggested building was published. There is, however, a remote possibility that the B.B.C. authorities may use the H.M.V. studio at St. John's Wood for the now famous "Music Hall" programmes, and they also have their eyes, I am told, on the Small Queen's Hall. But the odds are in favour of the skating rink.

## Trafalgar Day

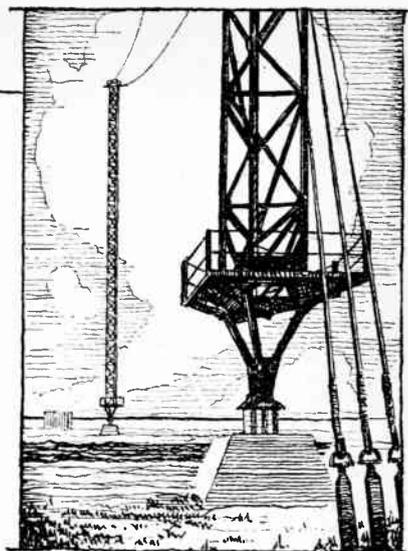
NINE scenes and forty speaking parts are comprised in a forty-five minutes' broadcast on October 21st in celebration of Trafalgar Day. The programme is drawn from "The Dynasts" by Thomas Hardy, and one scene is set in the cockpit of the *Victory*, where Nelson died.

## For Quality Lovers

IF a ballot were held to decide which is the favourite B.B.C. orchestral combination, I believe that the B.B.C. Theatre Orchestra would win a high place, especially among those listeners who concentrate on quality reproduction. For there is no gainsaying the fact that it is these smaller orchestras that are heard to the best advantage under modern receiving conditions.

## What We Hear

The Theatre Orchestra is now undergoing reorganisation under the direction of Mr.



Stanford Robinson. As it is always interesting to know just what instruments are being broadcast, I append a list showing the composition of the reconstructed orchestra.

- |                     |                     |
|---------------------|---------------------|
| Six first violins,  | One bassoon,        |
| Two second violins, | Two horns,          |
| Two violas,         | Two trumpets,       |
| Two 'cellos,        | One tenor trombone, |
| One double bass,    | One bass trombone,  |
| Two flutes,         | One tympani,        |
| One oboe,           | One percussion.     |
| Two clarinets,      |                     |

## "Kaleidoscope" Revived

ONE of the most haunting plays ever broadcast was "Kaleidoscope," representing the life of a man from the cradle to the grave. First heard five years ago, this play was a brilliant example of the fertile imagination of the author, Lance Sieveking. It was the earliest play of its type, and it is only fitting that it should figure in the festival of radio drama now running.

Listeners to the National programme will hear the revival on October 27th, and it will be heard by Regional listeners on the following evening.

## Synchronisation Phenomena

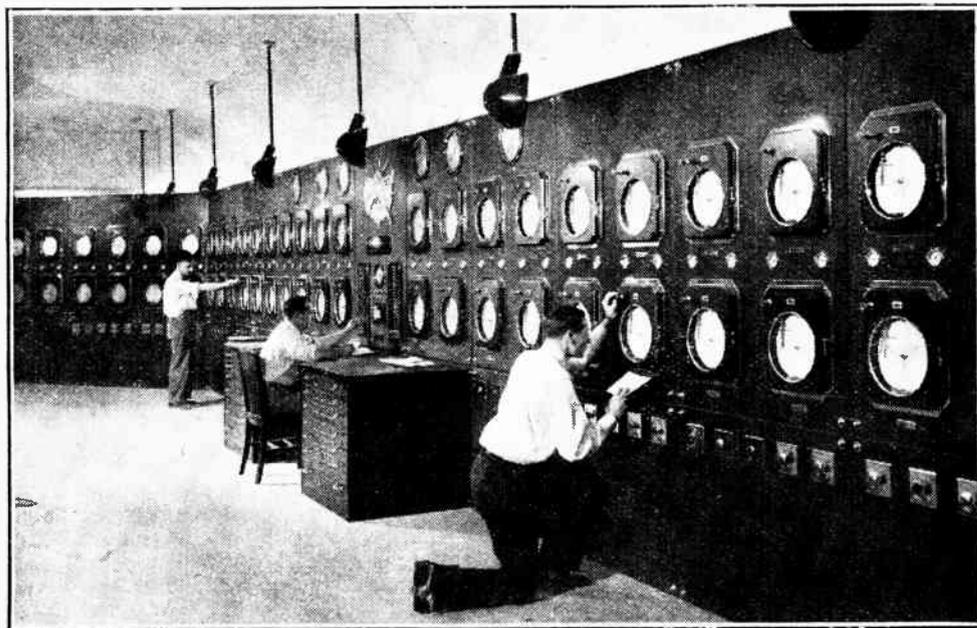
IT is now just possible when listening in certain of the outlying areas to observe the effects of synchronisation between West National and London National. Listeners have written to the B.B.C. complaining of "wavering" on sustained notes similar to that occurring on a swinging gramophone record, this beat note being caused by minute phase variations.

But considering that, according to the B.B.C., only three listeners have complained on this point, it might be premature to describe the experiment as a failure. However, the engineers, with the cautiousness of their tribe, declare that the trouble may be more pronounced with the approach of winter.

## Wales Changes Her Tune

Taken as a whole, West Regional station seems to be giving great satisfaction—too great, in fact, in South Wales, where many listeners report that they are swamped by the two transmitters.

This has its amusing side when one remembers the pother which arose in Wales when it was decided that West Regional should occupy a site on the other side of the Bristol Channel. Wales scented neglect on the part of the B.B.C., but that particular form of grouse seems to have died the death.



RADIO CITY, NEW YORK, is equipped with this special Air Controlling Plant, whereby the ventilation of each studio can be checked at any moment and changed to suit requirements. There are 64 dials. It is stated that four generators in the basement can produce "900 tons of refrigeration in 24 hours."

Letters to the Editor:—**Double-channel Transmission****Electricity Charges; Valves or Stages; Aerial Overhaul**

The Editor does not hold himself responsible for the opinions of his correspondents

**Double-channel Transmission**

IT may be of interest to know of some experiments which I have conducted in connection with Double-Channel Transmission or Binaural listening. Using two non-directional microphones 6in. apart, the currents were taken through separate amplifiers to "A" type Brown's earpieces. A switch was provided so that the two channels could be put in parallel. The increased spread of the orchestra when listening binaurally gave an effect very similar to that experienced when the frequency scale of the reproducing system was increased, the separation of the instruments being much greater. Binaural listening was undoubtedly much more realistic than when using a single channel. In order to ascertain whether it was necessary for the two channels to have identical frequency response curves, one of the Brown's earpieces was replaced by a cheap earpiece of the large iron diaphragm type having a very low natural resonance. Although the resulting frequency characteristic of the two channels were totally different, the advantage of binaural listening was still retained.

With regard to binaural listening through loud speakers, this presents a fundamental difficulty, inasmuch as for true binaural listening, the sounds which reach each ear have to be kept distinct and separate. Any loud speaker arrangement, except possibly one in which a loud speaker is fixed on each side of the listener's armchair, will have the disadvantage that the sounds from each speaker will reach both ears with comparable strength. Even in this case, the time lag if the listener's head is not central may spoil the effect, but I have not tested this question.

It would seem that the only practical way of imitating binaural listening with loud speakers is an arrangement where several microphones are spaced at considerable distances, and the reproducing loud speakers spaced in a similar manner. This arrangement will repeat at the listener's ear, more or less, the effect of the physical dimensions of the orchestra. It would be essential, however, for the loud speakers to be placed farther apart than would be possible if they were both included in a cabinet of the ordinary size.

P. G. A. H. VOIGT.

Upper Norwood, S.E.

**Wireless Sets and Electricity Charges**

WITH reference to your description as "audacious" the Mexborough notice printed on page 204 of your issue of September 1st, I consider that you are being unreasonable in your demand that wireless sets should be supplied at the domestic heating and cooking rate.

A typical scale of rates of charges is:—

Lighting, 5d.

Power, 3½d. for first 500 units.

After-hour shop lighting, 2d.

Domestic cooking and heating, 1½d. for first 200 units.

Water heating, ½d. (cut off during peak load).

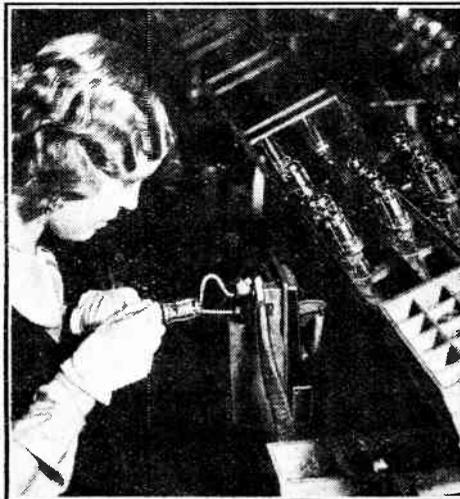
You might as well demand to couple wireless sets to the water-heating meter!

Probably 50 per cent. or more of supply authorities have, as a considered policy, a different scale for power from that for domestic heating and cooking.

A house using 600 units a quarter for heating and cooking would, on the sliding scale, get such current for 1d. a unit, whereas a factory would have to use 40,000 units per quarter on the power sliding scale to get down to 1d. a unit. Such seeming inequality can be strongly defended.

The basis for these different rates, depending on the filling up of "troughs" in the load line and the general raising of both load line and load factor, is a complicated business into which there is no occasion to go here, as the general principle remains established and sound economically.

By the majority of supply authorities it is stipulated that the domestic cooking and heating rate is not applicable to domestic power, e.g., a motor for pumping from the house's own well, or for working a lathe,



A spot-welding process in the manufacture of the new Cossor DD/PEN valve.

saw, etc., for which purpose the householder has the option of demanding a separate power meter, using separate internal wiring. With the high rate for a small quantity of power, coupled with a fixed half-yearly minimum charge and capital outlay on wiring, it would often pay the consumer to take such power through his lighting meter.

Strictly, in such cases, a vacuum cleaner, sewing machine motor, etc., should be charged at power rate, but many authorities might condone, though not approve, such small current-consuming devices being served from a heating plug.

In the same way the charging of accumulators for car or wireless purposes must be

Correspondence, which should be as brief as possible, should be addressed to the Editor, "The Wireless World," Dorset House, Stamford Street, S.E.1, and must be accompanied by the writer's name and address

from the power (or lighting) supply, and not from the heating, notwithstanding that an electric fire may be employed as the dropping resistance.

Is not your attitude—which apparently is not fully supported by the electrical Press—based on your incorrect conception of "power" wiring in private houses, whereas such wiring, other than the lighting wiring, is nearly always "heating or cooking" wiring?

That the power used in wireless sets heats the cathodes is no more relevant than the fact that a motor is heated by its current.

I agree with you to the extent that wireless sets and clocks should be supplied at power rates if the owner is agreeable to be so separately metered and to be charged the appropriate meter rent and minimum charges, but I think most would find it cheaper to revert to being charged at lighting rates, as in the cases of householders who only use an iron for an hour a week.

Anomalies are bound to crop up in detail of electrical charging, as electricity cannot be stored to the same degree as gas or water, and many lighting consumers are unable to grasp why they should pay more than the power scale. On these matters discussion might be interminable before conviction.

Staffordshire.

COLONEL.

**Valves or Stages?**

WE must agree, on reading the letter from Ferranti, Ltd., that neither by valves nor stages can we satisfactorily describe a receiving set, seeing that we have passed the time when each valve is a general-purpose valve with the same characteristics.

It seems to me that the abilities of a set are best described by giving first the maximum possible amplification (allowing, say, 5 per cent. distortion) expressed as a ratio between aerial input and L.F. output, and, secondly, the output in watts of the last stage.

Other facts, such as consumption, frequency range, whether volume automatically controlled and so on, would also be added, of course, and amongst them could be given the number of valves and their type.

Ipswich.

PENSEMULO.

**Importance of Aerial Overhaul**

THE importance of aerial overhaul to which you have drawn attention in recent issues cannot be too strongly stressed.

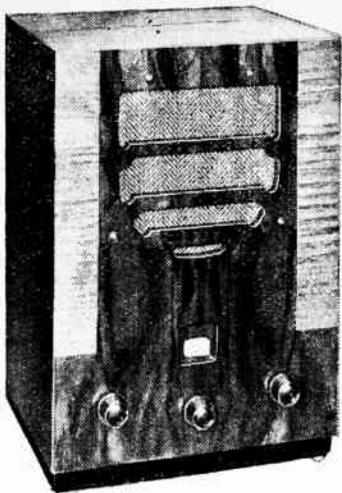
I made the following experiment some time back: On test, an aerial showed a reading of 2 megohms at 500v. D.C. The insulators were cleaned with carbon tetrachloride, the liquid was then filtered through a one inch square of blotting paper. The paper was then heat dried to expel any moisture, and a test made from two opposite corners. The result was a dead short.

If properly erected an aerial should give a reading of infinity, and this insulation can be made to hold good even in a storm of rain.

J. P. J. CHAPMAN

Bournemouth.

# Ferranti "Lancastria" Superhet



**FEATURES.** *Type* :—Self-contained table model superheterodyne receiver designed to work from A.C. mains on an external aerial. *Circuit* :—Detector oscillator with band pass input and image rejector circuit—I.F. amplifier—second detector (diode triode)—triode output valve. *Controls* :—(1) Tuning with illuminated wavelength scale. (2) Volume Control. (3) Wave-range and on-off switch. *Price* :—15 guineas. *Makers* :—Ferranti, Ltd., Hollinwood, Lancs.

## A Compact Receiver with Excellent Volume and Range.

**A**LTHOUGH the overall dimensions of this set are only 15½ in. × 10½ in. × 9 in., it is anything but a "midget" set in performance. With an energised moving-coil loud speaker and a power valve capable of an undistorted output of 2½ watts, the volume and quality would do credit to a small console radio-gramophone. The fullness of the bass response is particularly impressive for a cabinet of such small size, but there is no undue suggestion of resonance in this region. If reasonable care is taken in tuning, a very satisfying balance of tone is obtained over the frequency range, which extends well into the upper register.

The receiver is a four-valve superheterodyne, and the components have been designed and assembled with unusual skill, so that, although the overall dimensions of the chassis are small, there is no evidence that anything has been skimped.

The chassis as a whole is mounted on sponge rubber blocks to minimise microphonic noise, and special care has been taken to ensure immunity from electric shocks. The valves at the back of the cabinet are enclosed in cylindrical screens, to which access is obtained only after removing the channel-section cover plate.

There are three controls, the one in the centre operating the illuminated wavelength scale, that on the left combining the wave-range and on-off switch, and the one on the right the volume control. The sensitivity of the set is such that it is rarely necessary to make full use of the latter control, and Langenberg in daylight can be brought up to full loud-speaker volume with

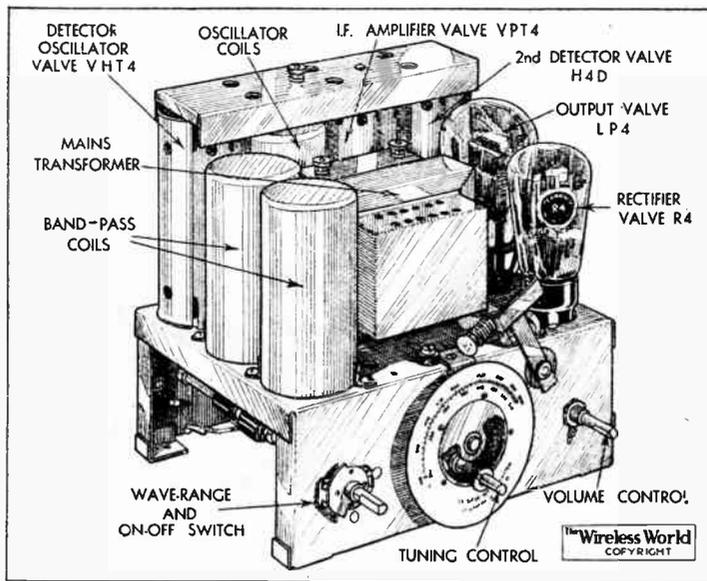
the control set at a little more than the half-way position. The wave-range control knob does not carry any indication marks,

the channels adjacent to the London National transmitter. Owing to the slightly higher signal strength of London Regional, it was barely possible to obtain adjacent channel selectivity, but there can be no doubt that an increase of distance of five miles or so from the station should bring this feat within the capabilities of the set.

The selectivity on long waves is equally good, and the reception on this range is notable for the absence of background noise.

There is very little interference due to second-channel whistles, and the only one which could be traced was in the neighbourhood of 500 metres and did not coincide with any important station. A special balancing circuit has been included in the input band pass filter to neutralise this type of interference.

The first valve in the circuit is the Ferranti-type VHT4 "heptode," which combines the functions of oscillator and first detector. It is followed by an intermediate frequency amplifying stage which includes four tuned circuits. The output from this stage is rectified by the Type H4D double diode triode, the two electrodes of the rectifier being bonded together, as automatic volume control is not included in the specification. Resistance coupling is used between this valve and the Type LP4 triode output valve which, as mentioned above, is designed to give an output of 2½ watts.



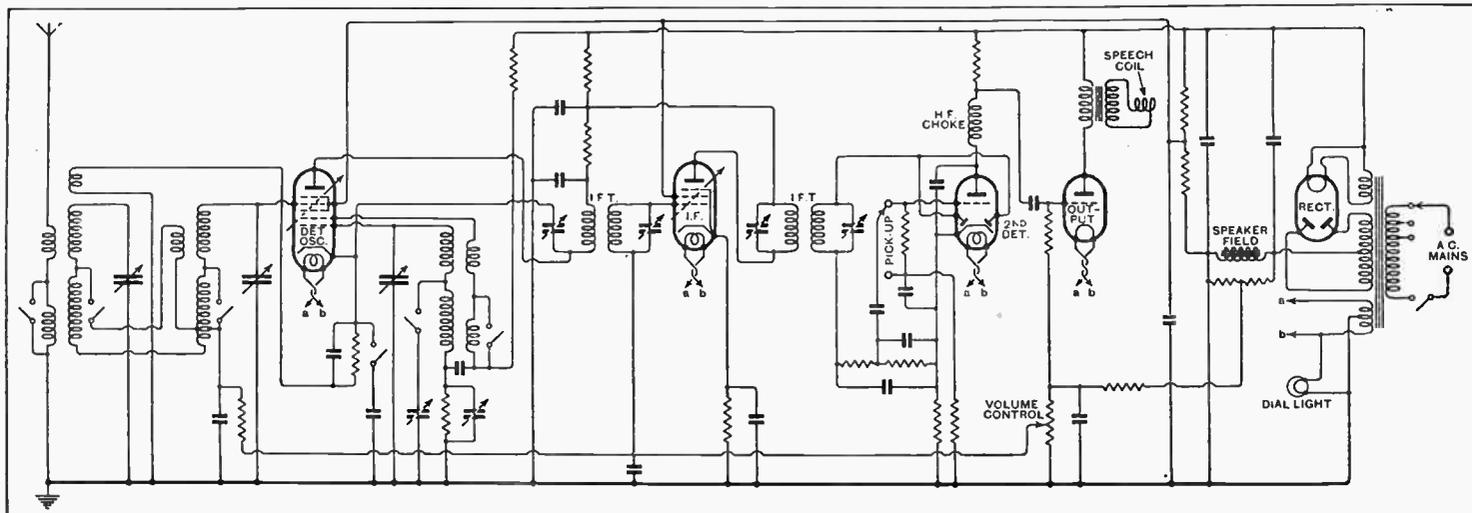
The "Lancastria" chassis is a model of compact design.

neither has switching for the gramophone pick-up been included, and the necessary change in the circuit must be made by removing the tag from the pick-up terminals at the back of the set.

The selectivity is remarkably good for a set of this type, and in Central London it should be possible to receive stations on

The power supply circuit follows normal practice, and the smoothing is efficient.

This is a receiver which clearly demonstrates that a high standard of performance does not presuppose a cabinet of bulky proportions, and it will go far to remove the prejudice which exists in some quarters against so-called "midget" sets.

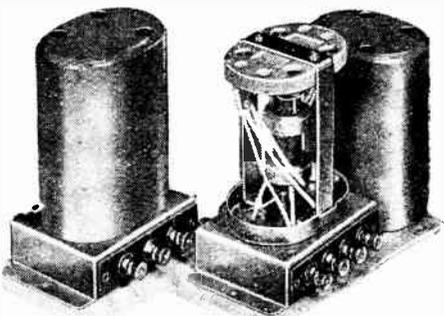


Complete circuit diagram. A heptode valve is used as a frequency changer and a diode triode in the second detector stage.

# New Apparatus Reviewed

## BRITISH RADIOPHONE I.F. TRANSFORMER

THE superheterodyne I.F. transformer made by British Radiophone, Ltd., Aldwych House, Aldwych, London, W.C.2, is of the fixed band width type, as provision is not made for varying the coupling between the coils. From tests made with some specimen transformers it would seem that optimum coupling is adopted as one peak only appears on its response curve.

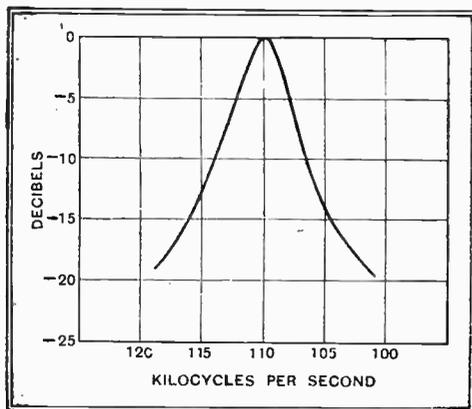


British Radiophone 110 kc/s I.F. transformers: one with cover removed.

High selectivity will, therefore, be a feature of all I.F. amplifiers in which this transformer is included, but a measure of tone correction will be desirable, and this may be obtained either by the use of a pentode output valve or by a tone compensated stage in the L.F. amplifier.

Both primary and secondary windings are tapped, that on the former giving an alternative connection for the anode of the preceding valve, while the secondary tap can be utilised to relieve this circuit of detector damping.

The small trimmer condensers are mounted above the coils, and access to their adjusting screws is given by holes in the aluminium cover. These condensers provide sufficient latitude to tune both circuits accurately to 110 kc/s under all conditions. Three terminals joining to inner, outer and tapping point respectively of each winding are mounted on opposite sides of the base, and the price is 10s.



Response curve of British Radiophone I.F. transformer using anode tapping on primary winding.

## POLAR STAR MINOR SUPERHET CONDENSER

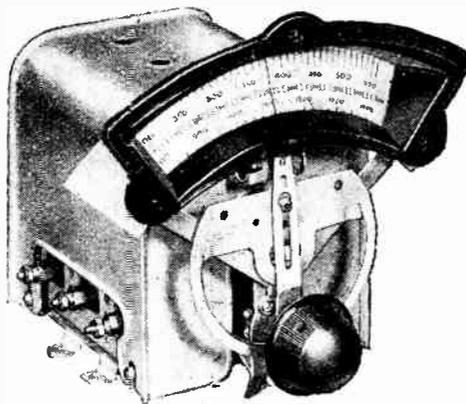
THE new range of gang condensers recently introduced by Wingrove and Rogers, Ltd., Arundel Chambers, 188-189, Strand, London, W.C.2, and known as the

## INTERESTING RADIO PRODUCTS

Star Minor models were developed to provide an efficient and accurately matched condenser unit in compact form. The three-gang model, for example, requires a baseboard space of 6in. x 4½in. including the drive, and the overall height is 4½in.

Rigid steel frames with the rotors carried in bearings of adequate size and entirely free from end-play and trimmers mounted on the top for accessibility constitute a few of the principal features of the new models. In the superheterodyne types the front section is fitted with tracking vanes shaped to maintain a 110 kc/s frequency separation with the pre-selector circuits when employed with coils of 157 m-henrys for medium waves and 1,900 m-henrys for the long waves in signal frequency circuits and 126.5 m-henrys and 925 m-henrys respectively for the oscillator coils. On long waves a series padding condenser of 0.002 mfd. is specified to give correct tracking. This should be semi-variable.

Tests made with a three-gang type show very good matching between the two sections of equal capacity. At one part of the scale only was the makers' tolerance



Polar Star Minor Superhet three-gang condenser.

of one half per cent. plus or minus one half micro-mfd. exceeded, but even so the deviation was no greater than one per cent. of the capacity, which is a quite tolerable amount.

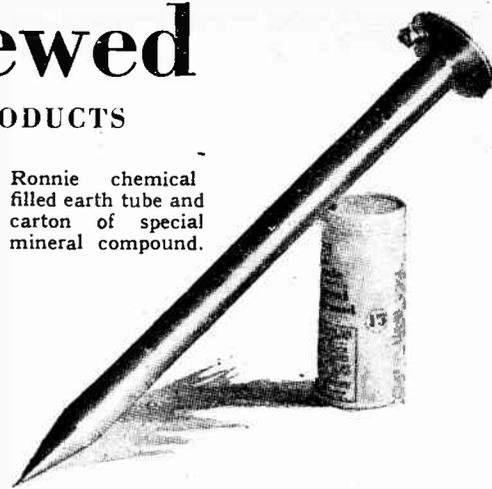
Tracking is satisfactory when using coils of the stated inductance and with a total minimum capacity of the order of 70 mfd.; incidentally, with this minimum value the wavelength calibration of the Polar dials is then substantially accurate.

The small trimmers allow a variation of 57 m-mfd. each, while the measured minimum capacity of each 0.0005 mfd. section is 20 m-mfd. A three-gang model costs 18s. 9d. and a four-section type 25s.

## RONNIE SCIENTIFIC EARTH TUBE

THIS earthing device consists of a perforated copper tube 12in. long and 1in. in diameter, fitted at one end with a stout gunmetal ferrule and at the other with a cup-shaped head, also of gunmetal, and to which is attached a terminal for the earth wire. The tube is filled with a special mineral compound, actually a preparation of copper sulphate, which possesses the property of attracting and absorbing moisture.

Ronnie chemical filled earth tube and carton of special mineral compound.



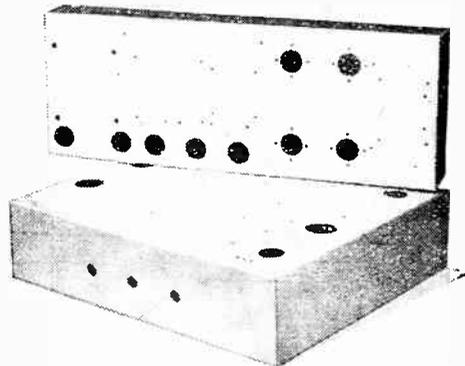
Its particular function is to lower the resistance of the earth connection, thereby improving the aerial system and so enhancing the performance of the receiver. The chemical is not only very hygroscopic, but it is also of a deliquescent nature, for even on the driest of days it absorbs moisture so rapidly that within a few hours it is in a liquid state and remains so indefinitely.

In order to assist the initial percolation of the chemical after the tube has been sunk in the ground a little water should be poured into the cup-shaped head. This will find its way out through the holes carrying with it the chemical into the surrounding soil. If during exceptionally dry weather some water is poured occasionally into the tube, or on to the ground in the immediate vicinity, it will assist in maintaining a good earth connection.

The price is 5s., and the makers are Ronnie Engineering, Crewdson Road, London, S.W.9. The special chemical is available separately in cartons containing sufficient to treat an existing earth at 1s. 3d.

## METAL CHASSIS FOR NEW MONODIAL SUPER

PROSPECTIVE constructors of the New Monodial Super receiver may be interested to learn that metal chassis for this set can now be obtained from the London Radio Development Services, 56, Hazel Road, London, N.W.10. They are made of 18 S.W.G. sheet steel, aluminium finished, and with holes drilled according to specification.

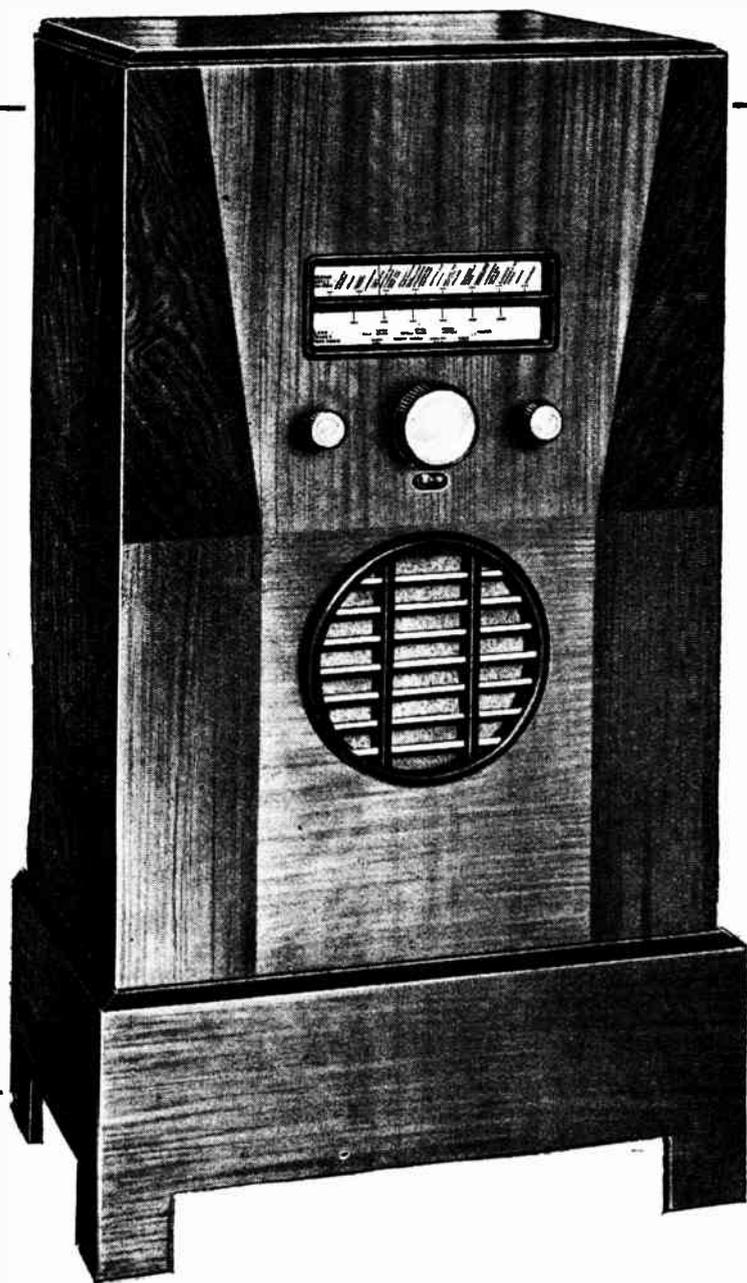


Receiver and power pack metal chassis for new Monodial Super, made by London Radio Development Services.

The receiver chassis is a full 12in. x 14in., and that for the power pack a shade over 18in. long x 6½in. wide. Fixing lugs, tapped to take 2BA screws, are fitted at each corner, and the price is 10s. 6d. for the receiver chassis and 7s. 6d. for the power pack chassis.

# Perfect in design...Peerless in performance

**INCORPORATING DELAYED AUTOMATIC VOLUME CONTROL**



This new EKCO Super-Het Console incorporates the wonderful 7-stage Super-Het Circuit of Model 74 and is available for A.C., D.C., and Battery operation. Housed in a handsome, modern cabinet with a highly polished two-tone satin-walnut finish and ebony beading, it has already become a very popular favourite.

British and Continental stations received at full programme strength with unsurpassed fidelity—**DELAYED AUTOMATIC VOLUME CONTROL** in All-Electric Models ensures desired volume from both distant and local stations—One Knob Control—**CLASS "B" OUTPUT** in Battery Model permitting "All-Electric" performance—Band-pass tuning—New Station scale with names and wave-lengths—Light-Beam and Shadow station selector—Combined on-off switch and volume control for radio and gramophone—Moving-Coil speaker—Gramophone pick-up sockets with switch—External speaker connections.

*Model*  
**C. 74**

**18 guineas**

or by 12 monthly payments of £1 14s. 9d.

**EKCO**

**RADIO**

To E. K. Cole, Ltd., Dept. W.28, Ekco Works, Southend-on-Sea.

A full coloured folder will be sent to you free on receipt of this coupon.

Name .....

Address .....

*Send coupon for full details*

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The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

For particulars of Box Number Advertisements and Deposit System see previous issues.

## RECEIVERS FOR SALE.

**W.W.** Single Dial Super (battery), Osram valves; £4/10.—R. Atkin, 9, John St., Battersea. [3673]  
£5.—Ferranti S.G.4, push pull output; cost £21.—If interested write 10, Dors Close, Kingsbury, N.W.9. [3674]

**A.C. Baby Superhet.** Ferranti M.I. Speaker, separate cabinets; £14, or best offer.—Bartlett, 624, High Rd., Chiswick. [3646]

**SAVE 60%.**—Most comprehensive stocks in country: list 1/4d. stamp.—Radio Mart, 19, John Bright St., Birmingham. [3652]

**PHILLIPS 1933 5-valve All-mains 110-250 A.C. Receiver;** cost £24/3, sell £14; demonstration.—5, West Side, Phone: Wimbledon 3470. [3672]

**W.W.** Monodial A.C. Super (original model), new, and to specification in practically all details; £11.—Particulars, Box 8332, c/o The Wireless World. [3680]

**FIRST A.C. Monodial** Built to Specification, as new, not been used, guaranteed perfect; no reasonable offer refused.—H., 4, Denver Drive, Timperley, Cheshire. [3697]

**H.M.V. Model 459 Superhet.** Portable Six, new December last, perfect condition; cost 17 guineas, take £9, or near offer; can be seen at Brixton.—Box 8309, c/o The Wireless World. [3645]

**SUPERHET** Chassis, 5 Mullard valves, Rola speaker, radiogram switch; 10½ guineas chassis, 11 guineas cabinet; carriage paid; cash or c.o.d.—Pollard, 85, Fortis Green, London, N.2. [3670]

**"WIRELESS WORLD"** Receivers Built to Specification, fully guaranteed, also supplied as kits; write for quotations; Hazel Rd., Kensal Rise, N.W.10. [3682]

**MARCONIPHONE "Super-8"** Superhet, with fitted directional frame aerial, complete with valves and spares; Marconiphone I.T. eliminator, large accumulator and Marconiphone loud-speaker, all in perfect condition; £8.—Box 8336, c/o The Wireless World. [3608]

**TO Meet a Steady Demand for Second-hand Sets and Components** we can make a very liberal allowance for these in part payment of any 1933-34 receiver or kit; any "W.W." specified parts supplied; best deliveries; don't hesitate; cash or H.P.—MacInnes and Co., 99, Waterloo St., Glasgow. [3689]

**AMPLIFIER, G.E.C.** 60-watt, battery operated 4 stages, portable, milliammeter circuit each stage, volume and pitch control, in teak carrying cabinet complete with 6 crates Exide special P.A. H.P. batteries, valves, microphone and control box, all new and unused, carried as a portable job during "Daily Mirror 8 Tour"; cost £150, sell £25; wanted, first class "Superhet" battery or mains.—Mobile Amplifiers, 6, Conduit St., W.1. [3683]

**ARMSTRONG** Latest 1934 Universal 4V Chassis, incorporating 3 tuned circuits in square peak, approximately 9 kilocycles separation, giving practically super-heterodyne performance, full vision single knob tuning, combined switching, one knob controlling every operation, automatic voltage control, compensated multi-grid output, designed for perfect working on any voltage, direct or alternating current, without alteration; 75/- with 5 valves 114/-; fully guaranteed; approval willingly.—Armstrong Co., 100, King's Rd., N.W.1. [3690]

## MAINS EQUIPMENT

**N.P.** for Battery Chargers; genuinely the lowest prices in the trade.

**N.P.** Send Trade Lists and New Range of Photographs; of Latest Plants.

**N.P.** Have One or Two Slightly Soiled Instruments; bargains; 24v. 1 amp. 55/-; 24v. 2 amp. 95/-; metal rectified; Philips 6 amp. 75/-; 75v. 6 amp., 3 circuits as new, £12/5, etc.; satisfaction or cash refunded.

**N.P.** Make H.T. and L.T. Chargers for Battery Stations from 62/6 to £17/10, suitable for dealing with hundreds of batteries at one time; trade list and photographs.

**N.P.** Advice on All Matters of Battery Charging, diagrams supplied for complete wiring of cells, plant only needs plugging in and switching on; state your needs—the season has commenced now.—Nash Products, Ltd., Stechford, Birmingham. [3664]

**PARTRIDGE** Transformers.—Self praise is no recommendation, but praise from experts is significant.

**PARTRIDGE** Transformers.—"a sound electrical job, very good value." *Wireless World*, Sept. 15th.

**PARTRIDGE** Transformers.—"voltage regulation excellent... transformer remained remarkably cool." *Radio Trade Review*, May, 1933.

**PARTRIDGE** Transformers.—"found to be excellent... designed on sound lines." *Wireless Magazine*, October, 1932.

**PARTRIDGE**—250-0-250v., 60 m.a., 4v. 1a., 4v. 2-4a., 11/-; 250-0-250v., 6C m.a., 4v. 1a., 4v. 2-3a., 4v. 1a., 12/-.

**PARTRIDGE**—350-0-350v., 60 m.a., 4v. 2-2½a., 4v. 2-4a., 13/6; 350-0-350v., 120 m.a., 4v. 2-2½a., 4v. 3-5a., 4v. 1a., 17/3.

(This advertisement continued in third column.)

# PILOT AUTHOR KITS

Exact to Specification

AS FOUNDERS OF CONSTRUCTORS' SETS IN 1919, we have established a world-wide reputation for the supply of Complete Kits and Part Kits for all "Wireless World" Set designs. An essential feature of this Expert Service to the Home Constructor is **IMMEDIATE DELIVERY FROM STOCK—CASH or C.O.D.**—of any exclusively specified or difficult to obtain component. Rely on PETO-SCOTT, he always gives fullest satisfaction to every customer.

## A.V.C. THREE

Kit 'A'—Author's Kit of First Specified Parts, including Peto-Scott Plymax Chassis and Ply Panel, assembled and drilled, less valves and cabinet. **£10-15**

or 12 monthly payments of 19 9.  
**COMPLETE KIT As Kit 'A' but with Specified Valves. Cash or C.O.D. Carriage Paid £14-16**  
or £2-1-6 Deposit and 11 monthly payments of 24/-.

THESE ARE THE PARTS THE AUTHOR USED:

1 J.B. "Nugang" No. 2064 3-gang variable condenser and £ s. d.	1 2 6
1 ORBOND R 297 variable condenser 0.0002 mfd.	2 0 0
1 ORBOND R 355 Knob for above	2 0 0
1 WEARITE "Nucleon" (Coils, B.P.1, B.P.2, T.G.)	1 17 6
1 MULTITONE "Toco" Transformer 1:4	17 6 0
1 MULTITONE Tone Control Potentiometer for above	3 6 0
1 WATMEL T4 Wfd. tapered Control, 250,000 ohms	3 0 0
1 WEARITE H.P. H.P. Choke	3 0 0
1 WEARITE H.P.F.A. H.P. Choke	3 0 0
1 DAVENSET No. 101 Power Smoothing choke	16 0 0
1 VORTEXION Type AC/34 Mains Transformer	18 0 0
1 CLIX Chassis mtr. air spring type 5-pin valveholders	3 9 0
2 CLIX Floating type 7-pin valveholders	2 0 0
2 TELSEN W.217 0.0001 mfd. fxd. cond.	1 41 0
1 TELSEN W.211 0.0005 mfd. fxd. cond.	1 6 0
1 TELSEN W.229 0.25 mfd. 500 v. D.C. Test cond.	4 8 0
1 TELSEN W.316 0.05 mfd. fxd. cond.	1 9 0
1 TELSEN W.327 1 mfd. 500 v. D.C. test cond.	5 0 0
1 TELSEN W.226 2 mfd. 500 v. D.C. test cond.	6 0 0
1 TELSEN W.411 0.1 mfd. 1,500 v. D.C. tubular cond.	1 3 0
1 TELSEN W.410 0.01 mfd. 1,500 v. D.C. tubular cond.	1 0 0
1 TELSEN W.408 0.005 mfd. 1,500 v. D.C. tubular cond.	4 6 0
1 TELSEN W.396 dry elec. cond. 4 mfd. 500 working	5 6 0
1 TELSEN W.398 8 mfd. dry elec. cond. 500 working	2 6 0
1 TELSEN W.369 25 mfd. dry elec. cond. 25 volts	16 6 0
1 GRAHAM FARISH "Omnite" resistances, as specified	12 6 0
1 GRAHAM FARISH Standard grid leak 2 megohm	3 0 0
1 GRAHAM FARISH Standard grid leak 0.5 megohm	3 0 0
2 LAUDE LYONS 728 on-off switches	1 9 0
4 BELLING LEE Type B terminals, A.E. Pick-up (2)	2 0 0
1 PETO-SCOTT Wood Panel 12 in. x 15 in. x 8 in.	12 6 0
1 PETO-SCOTT Plymax Baseboard 12 in. x 15 in.	12 6 0
2 ozs. No. 20 tinned copper wire; 6 lengths Systoflex; 1 length screened sleeving; wire, Paxolin, flex, etc.; screws; 19 in. No. 4 R hd., 36 in. No. 4 R hd., 18 in. No. 4C sk. 1 6RA R hd. with nut and washers	7 0 0

**ALWAYS BUILD ON PLYMAX**  
**PETO-SCOTT PLYMAX CHASSIS AND PLY PANEL SOLELY SPECIFIED.** Plymax Chassis as specified by the Author, drilled and assembled, 18" x 10" x 2 1/2". **15/-** Cash or C.O.D. Post and Packing 1/3 extra.

**FINISHED INSTRUMENT**  
A.V.C. THREE—Ready Assembled exact to Author's Specification with Valves and Cabinet. **£17-17-0**  
Aerial Tested. Cash or C.O.D. Carriage Paid  
or £2-17-0 Deposit and 11 monthly payments of 30/-

**RECOMMENDED**  
**PETO-SCOTT WALNUT A.V.C. THREE CABINET**  
A handsome figured Walnut Cabinet specially recommended for the A.V.C. Three. Constructed throughout with well-seasoned timber by London's leading piano craftsmen. Front ready drilled for panel controls. Cash or C.O.D. Carriage Paid. Size 25" x 15" x 8"  
**25/-**  
SEND FOR 1934 CABINET CATALOGUE



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**FOREIGN ORDERS.** Send one-third value of goods with order. Balance (including forwarding charges) payable to our forwarding agents on delivery. Insurance effected if desired. All orders carefully executed and expertly packed by special export staff.

**PETO-SCOTT CO. LTD.**  
77, CITY ROAD, LONDON, E.C.1.  
West End Showrooms: 62, High Holborn, London, W.C.1

## Mains Equipment.—Contd.

(This advertisement continued from first column.)  
**PARTRIDGE**—425-0-425v., 120 m.a., 4v. 2-2½a., 4v. 3-5a., 4v. 2a., 20/6; 500-0-500v., 100 m.a., 4v. 2-2½a., 4v. 3-5a., 4v. 2a., 21/-.  
**PARTRIDGE**—500-0-500v., 120 m.a., 4v. 2-4a., 4v. 3-6a., 4v. 1-2a., 4v. 1-2a., 27/6; larger types to order.  
**PARTRIDGE**—0-71-9-11v., 1.2a. 9/3; 0-15-18-22v., 1.2a.; 10/-; any other model to order.  
**PARTRIDGE**—135v. (tapped 110v.), 90 m.a., 4v. 2-4a., 10/6; 240v. (tapped 200v.), 200 m.a., 4v. 2-4a., 13/3.  
**PARTRIDGE**—Step-up or step-down auto transformers 60w., 10/3; 100w., 12/9; others to order.  
**PARTRIDGE** Chokes.—6H., 500 m.a., 45 ohms, 18/6; 13H., 200 m.a., 120 ohms, 11/6; 20H., 120 m.a., 320 ohms, 9/3.  
**PARTRIDGE** Chokes. 30H., 60 m.a., 550 ohms, 7/9; 40H., 40 m.a., 700 ohms, 6/6; all constant inductance.  
**"WIRELESS WORLD"** A.V.C.3 Transformer, 13/6; choke, 7/9; new Monodial transformer (competitive model), 24/-.  
**LARGE** Power (5w. to 100w. speech) Output Transformer within 1 lb. from 50 to 8,000 cycles.  
**PARTRIDGE** Transformers.—Trade enquiries invited.  
**PARTRIDGE**, N., B.Sc.(Eng.), A.M.I.E.E., A.I.Rad.E.  
**PARTRIDGE**, N., King's Buildings, Dean Stanley St., London, S.W.1. Tel.: Victoria 5035. [3660]  
**VORTEXION** Lead Again.  
**VORTEXION** A.C./34, used by author in construction of a V.C. Thru; see also displayed advertisement, page 6.  
**VORTEXION**, Wimbledon, for 99.9% reliable transformers.  
**IF** You Haven't Tried Them Yet Ask Someone who has, or call and inspect complimentary letters.  
**G**UARANTEED 12 Months, and within 5% normal and 2½% super models, neat shrouding, with detachable feet, as used by Government Departments, etc., etc.  
**VORTEXION**—New monodial transformer, 200-250-50 v. cycles, 425-0-425, 120 m.a., 4v. C.T. 3a., 4v. C.T. 1a., 4v. C.T. 1a., 4v. C.T. 6a., screen primary, open type, 20/-; shrouded, 22/-; super shrouded, 26/-; weight 14 lb. henry, 8/6.  
**VORTEXION**—5-watt Monodial A.V.C. model, 400-0-400, 120 m.a., 4v. 6a., 4v. 3½a., 4v. 2, 4v. 1a., super shrouded, 20/-; shrouded 24/-.  
**VORTEXION**—350-0-350, 120 m.a., 4v. 2 to 5a., 4v. 2 to 4a., 4v. 2.5a.; open type 14/6, shrouded 16/6.  
**VORTEXION**—490 or 450 or 500v., 120 m.a., 4v. 2 to 5, 4v. 2 to 5, 4v. 2 to 5; open type 19/-, shrouded 23/-.  
**VORTEXION**—400 or 450 or 500, 150 m.a., 4v. 4a., 4v. 2.5, 4v. 2, 4v. 2, 4v. 2, core size 2¼in. x 1¼in., a superb job, 2½ regulation, 35/-; shrouded with terminals, 30/-; open type 26/-; post 1/3.  
**VORTEXION** Auto Transformers to B.L.S.A. Specification, 00, 110, or 120v. to 200, 220 or 240 volts, 60 watts, 9/-; post 9d.; 120 watts, shrouded 12/6, open post 1/3; 500 watts 30/-, 2,000 watts £4/10, carriage free.  
**VORTEXION** 600-watt Transformers; £4/10, carriage free.  
**VORTEXION** 30h. at 60 m.a. Chokes, 5/6; 40h. at 60 m.a., 8/6; 30h. at 150 m.a., 200 ohms, 10/6 open type, 12/6 shrouded.  
**VORTEXION** Transformers Made to Your Specification; price according to wattage, 6v. filaments same price unless wattage grossly exceeded; special quotations by return.  
**VORTEXION** (S. A. BROWN), 182, The Broadway, Wimbledon, S.W.19. Tel.: Liberty 2814. [3686]  
**HOYNE'S** Transformers and Chokes the Best Obtainable, perfect insulation, regulation and reliability.  
**HOYNE'S** Transformers used by many well-known set manufacturers after testing all others.  
**HOYNE'S** Transformers fitted with tapped and screened primaries, filaments all centre tapped, stout cast aluminium clamps and clearly marked terminal strips are fitted to all models.  
**HOYNE'S** Components are guaranteed for one year; built to your own specification at very competitive prices.  
**HOYNE'S** Components.—The components you will eventually use, start right; a dud cannot pass the Hoyne test.  
**HOYNE'S** A.V.C. Three 275-0-275v. 60-70 m.a., 4v. 2.5a., 4v. 4a., 12/6, post 1s.; choke, 30 henry 50 m.a., 7/6, post 6d.  
**HOYNE'S** New Monodial Transformer, 425-0-425v., 120 m.a., 4v. 3a., 4v. 1a., 4v. 1a., 4v. 6a., 24/-; post 1/3; weight 10lb. 10 henry choke, 6/-, post 6d.; 20 henry choke, 7/6, post 6d.  
**HOYNE'S**—250-0-250v. 60 m.a., 4v. 1-2a., 4v. 2-4a., 10/-, post 9d.; with extra 4v. 1-2a. winding, 12/6, post 1/-.  
**HOYNE'S** Ferrocart Model.—350-0-350v. 60-70 m.a., 4v. 2-3a., 4v. 2-4a., 12/6, post 1/-; with extra 4v. 1-2a. winding, 13/6, post 1/-.  
**HOYNE'S**—500-450-0-450-500v. 140 m.a., 4v. 2-4a., 4v. 4-6a., 4v. 2a., 4v. 2a., 27/6, post 1/3; weight 11lb.  
**HOYNE'S**—0-110-135v., 90 m.a., suitable for H.T. 6 or 7, 7/6, post 9d.; with 4v. 2-4a. winding, 9/6, post 9d.  
**M. J. HOYNE**, Offices and Works, 8a, Gladstone Rd., Wimbledon, S.W.19. Tel.: Liberty 3303. [3647]  
**TANTALUM** for A.C. Chargers, H.T. and L.T.—Blackwell's Metallurgical Works, Ltd., Garston, Liverpool. [3448]  
**A.C. Valve Charging Boards** (unused), outputs 20/25/30 volts, 6 amps.; list £14, for £5/10.—Jersey, Cumnor Hill, Oxford. [3675]  
**BIRMINGHAM RADIO MART'S** latest list; everything the contractor requires at 60% saving.—19, John Bright St., Birmingham. [3650]

Mention of "The Wireless World," when writing to advertisers, will ensure prompt attention.

**Buy ALL Your Radio FROM DIRECT RADIO Ltd.**  
159, BOROUGH HIGH STREET.  
"THE WIRELESS WORLD" A.V.C. THREE

**LIST OF PARTS.**

1 J.B. "Nugang" 3-gang Variable Condenser and disc drive, No. 2064	£ 8. 0	d. 0
1 Ormond R 507 Variable Condenser, .0002 mfd.	2	0
1 Ormond R 355 Knob, for above	3	0
3 Varley Iron Core Coils, per set	1 13	0
1 Multitone "Toco" 1-4 Transformer	17	6
1 Multitone Tone Control Potentiometer	3	6
1 Watmel T.4 Vol. Control Potentiometer, 250,000 ohms tapered	6	6
1 Wearite H.F.P.A. H.F. Choke	3	6
1 Wearite H.F.P.A. H.F. Choke	4	0
1 Varley DP.11 Power Smoothing Choke	15	0
1 Vortexion Mains Transformer	18	0
3 Clix 5-pin V holders, chassis mounting	2	3
2 Clix 7 pin V holders, floating type	2	0
2 T.C.C. Fixed Condensers, .0001 mfd., Type "M"	1	4
1 T.C.C. Fixed Condenser, .0005 mfd., Type "M"	9	
1 T.C.C. Fixed Condenser, .25 mfd., Type 40	2	3
1 T.C.C. Fixed Condenser, .05 mfd., Type 40	1	9
1 T.C.C. Fixed Condenser, 1 mfd., Type 50	2	6
2 T.C.C. Fixed Condensers, 2 mfd., Type 50	7	0
4 T.C.C. Tubular Condensers, .1 mfd., Type 250	5	4
1 T.C.C. Tubular Condenser, .01 mfd., Type 300	1	3
1 T.C.C. Tubular Condenser, .005 mfd., Type 300	1	3
1 Dubilier Dry Electrolytic Condenser, 4 mfd.	4	6
1 T.C.C. Dry Electrolytic Condenser, 8 mfd.	6	6
1 T.C.C. Dry Electrolytic Condenser, 25 mfd., Type 511	3	0
1 Ready Radio Thernium Resistance, 200 ohms	6	
1 Ditto 500 ohms	6	
1 Ditto 1,000 ohms	6	
1 Ditto 2,000 ohms	6	
1 Ditto 7,000 ohms	6	
2 Ditto 10,000 ohms	1	0
1 Ditto 17,500 ohms	6	
1 Ditto 20,000 ohms	6	
1 Ditto 25,000 ohms	6	
1 Ditto 100,000 ohms	6	
1 Ready Radio Grid Leak, 2 megohms	6	
1 Ready Radio Grid Leak, .5 megohms	6	
2 Bulgim S.80 On-off Switches	3	0
1 Bulgim S.81 Switch	1	9
1 Length Harlows Screened Sleeving	9	
4 Belling Lee Type B Terminals, A., E. (2) Pick-up	2	0
1 Wood Panel, 1in. ply, 15in. x 8 1/2in.	1	6
1 Baseboard, 12in. x 15in. x 3/4in.	1	6
Wire, Flex, Screws, etc.	4	7
1 Set of Valves, as specified	3	6
	£13	0 0

**KIT "A" (LESS VALVES) £9-13-6 (AND CABINET)**

Or deposit of 28 6 and 11 monthly payments of ... 18 3

**KIT "B" (WITH VALVES) £13-0-0 (LESS CABINET)**

Or deposit of 35 - and 11 monthly payments of ... 1 4 0

Any component can be supplied separately.

**Recommended by Direct Radio:**

**Lissen 7 Valve Super Het Chassis Model with valves £8-17-6** Cash or C.O.D., or deposit of 35 6 and 11 monthly payments of 15 -

**Lissen Skyscraper Three complete with 3 valves £4-9-6** Cash or C.O.D., or deposit of 25 6 and 11 monthly payments of 6 9.

**Station Master 4 with valves**

£4-6-6 Cash or C.O.D., or deposit of 21 6 and 11 monthly payments of 6 9.

**Atlas Eliminator type C.A.25**

£2-19-6 Cash or C.O.D., or deposit of 19 - and 6 monthly payments of 8 3.

**Blue Spot 29 P.M. Moving Coil Speaker**

£1-12-6 Cash or C.O.D., or deposit of 12 6 and 5 monthly payments of 5 -.

**Ferranti Class B Speaker Amplifier**

£4-4-0 Cash or C.O.D., or deposit of 25 - and 5 monthly payments of 8 3.

Visit our Showroom at 159, Borough High Street. Write for quotation for any radio requirements. Prompt Despatch.

**CASH, C.O.D. and EASY PAYMENT ORDER FORM**

To DIRECT RADIO LTD., 159, Borough High Street, London Bridge, S.E.1.

Please despatch to me the following goods.....

(a) I enclose (b) I will pay on delivery (c) I enclose first payment of

Cross out line not applicable £

NAME .....

ADDRESS .....

**Cabinets.—Contd.**

**RADIO-GRAM Cabinets;** fully illustrated list free; remarkable values.—Gilbert, Cabinet Maker, Swindon. 1686

**MANUFACTURER'S Clearance Lines of Cabinets** for Radiograms, loud-speakers, and radio sets; hundreds to select from; send postcard for list; special: cabinets for Skyscraper and S.P.400.—H. L. Smith and Co., Ltd., 289, Edgware Rd., London, W.2. 13409

**DYNAMOS, ETC.**

**ROTARY Converters,** 220 volts D.C. to 200 volts A.C., capacities up to 0.44 K.V.A., from £4 10.—Milo Engineering Works, Milo Rd., East Dulwich, S.E.22. Phone: Sydenham 4422. 13641

**F.D.C. Rotary Converter,** 230v. D.C. input 230v., 50-230 watts A.C. output, in soundproof cabinet, as new, with filter unit: £10.—Apply Knights Radio Stores, Leigh Pd., Leigh-on-Sea. 13550

**GRAMOPHONES, PICK-UPS, ETC.**

**EPTON Leads Again!**—Famous Blue Flyer A.C. induction gramophone motors, with turntables, brand new (listed £6 6), few only; 29 6.—Epton, 93, New Rd., Chingford, E.4. 13669

**LOUD-SPEAKERS.**

**B.T.H. RK Moving Coil Speakers,** guaranteed new, unused, manufacturers' surplus, original price.

**6** Guineas, highly sensitive and wonderful tone response, will handle up to 10 watts output, available for 6v., 100v., 200v. D.C., 30 -; also A.C. models.

£2 10/- carriage paid, e.o.d. or cash with order; the best value in speakers obtainable to-day.—O. H. Seckamp, First Avenue House, High Holborn, London, W.C.1. Phone No.: Holborn 6609. 13425

**MAGNAVON Loud-speaker D.C.143,** 7.50 ohms, 3-ratio transformer, 10in. diaphragm; £1/10.—Box 8304, c/o The Wireless World. 13642

**10/-**—Lampugh Silver Ghost, 2,200 ohms, with output transformer, unopened; list 47/6; e.o.d., carriage paid, Kav. 167, City Rd., London, E.C.1. 13351

**30/-**—B.T.H. R.K. moving coil speakers, 6in. cone, new and unused, guaranteed; these speakers are the type as used in cinema sound equipment; suitable for public address work; weight 30lb., and vastly superior to the cheap speakers now on the market, 100 volts, 150 volts, and 200 volts D.C.

**27/6**—6-volt D.C. speakers, as above; 22/7 6 complete with field rectifier.

**B.T.H. Transformers,** brand new, ratios 1-1, 2-1, 20-1, and 30-1 microphone, 7/- each.

**CARRIAGE** Paid, cash with order, or e.o.d.—Ward, 12, Treloar Rd., Bow, E.3. Tel.: Advance 3668. 13687

**CHAL-ELECTRIC Offer New Boxed Set Manufacturers' Surplus Rola Speakers,** all fitted hum buckers, state for power or pentode: F6, 110-175v. (2,000 ohms), 90-130v. (2,500 ohms), 150-200v. (4,700 ohms), 200-250v. (6,500 ohms), list 35 -; at 18 -; each; F7, voltages as above, list 47/6, at 25 -; permanent magnets, F6, P.M., list 49 6, at 28 -; F7, P.M., list £3 10, at £2, or (1) F6 and (1) F7, list £4 5, at 47 -; few Class B; state requirements all goods carriage paid, cash with order, or e.o.d.—Chal-Electric, 6, Conduit St., London, W.1. 13524

**TRANSMITTERS.**

**SPECIAL Short Wave List,** 1 1/2, list.—Radio Mart (G5N1), 19, John Bright St., Birmingham. 13654

**VALVES.**

**VALVES.** All types American screen grids, etc., in stock.—Midway Radio Exchange, 24, Midway Grove, London, N.11. 13531a

**THE M.R.D. Co's Own New British Valves,** guaranteed 6 months, carriage paid; we invite blindfold tests against any other make.

**2-VOLT Range,** V.M. S.G., S.G.2, 7 6; I.P.2, H.F.2, H.L.2, R.C.2, 3 C; driver, 4/-; P2, 4/6; Pen.2, 10/-; Class B D, watts 9 -; 3 watts 9 -.

**A.C. Range,** V.M. S.G.A., S.G.A., 12 6; H.L.A.C., I.P.A.C., 7 6; P.A.C., 8 6; Pen. A.C., 15 -; details and characteristics on request.—Mains Radio Development Co., 4-6, Muswell Hill Rd., London, N.6. 13701

**THE Following English, American and Continental valves in stock:** Philco, Tritron, Tangsram, Hivac, and 325 valves; prompt attention.—Newman, 309, Roman Rd., Bow, E.3. 13699

**EPTON Leads Again!**—Tritron 8431N (A.C.S.G.), 6/6; American 236, etc., 11 6; 280, etc., 9 11. See also "Cabinets" and "Gramophones" sections. Epton, 93, New Rd., Chingford, E.4. 13668

**ALL Latest Types of Brand New American Valves,** first class makes: 247s, 235s, 224s, 236s, 237s, 233s, 245s, 244s, 12/-; 227s, 226s, 280s, 245s, 9/6; 242s, 232s, 11/-; U.X.210s, 15 -; U.X.250s, 7 watts output, 16/-; 281s, 14 6; post paid, cash with order or e.o.d.—Ward, 12, Treloar Rd., Bow, E.3. Tel.: Advance 3668. 13683

**SPECIAL Offer Valves by world-famous Continental manufacturers,** fully guaranteed, screen grid, variable mu screen grid, high magnification screen grid, low magnification screen grid, H, H.L., L, R.C., power, super power, directly heated pentode, directly heated power pentode; all the above standard mains type, 4/6 each; 300v. 60 milliamp. rectifier 5 6, 350v. 120 ma. 6/6, 500v. 125 ma. 7/6; the following 4 volt battery valves at 2/- each: H, H.L., L, power, screen grid.—Premier Supply Stores, 20-22, High St., Clapham, S.W.4. Mauteluy 2188. 13795

**COMPONENTS, ETC., FOR SALE.**

**PREMIER SUPPLY STORES** Offer the following Set Manufacturers' Surplus New Goods at a fraction of the Original Cost, all goods guaranteed perfect, carriage paid over 5/-, under 5/-, postage 6d. extra (Ireland, carriage forward).

**ELIMINATOR Kits,** including transformer, choke, Westinghouse metal rectifier, T.C.C. condensers, resistances and diagram, 120v. 20 ma., 20 -; trickle charger 8 -; extra: 150v. 30 milliamps, with 4v. 2-0 amps. C.T., I.T. 25 -; trickle charger, 6 6 extra; 250v. 60 milliamps, with 4v. 3-5 amps. C.T., I.T., 30/-; 200v. 100 milliamps, with 4v. 3-5 amps. C.T., I.T., 49 6; 300v. 60 milliamps, with 4v. 3-5 amps. C.T., I.T., 37 6.

**T.C.C. Condensers,** 750v. working, 2 mf. 3/6, 4 mf. 6/-, 4 mf. 450v. working 4/-, 250v. working 1 mf. 1/-, 2 mf. 1 9, 4 mf. 2/6, 1,500v. working Standoff insulators 0.5 mfd. 1/6, 2 mfd. 6/-, aqueous electrolytic 440v. working, 4 mf. 3/-, 8 mf. 3/6.

**ALL the Following Lines 6d. each or 5/- per dozen:** 4- and 5-pin chassis mounting valve holders; shielded screen grid or pentode leads 1-watt wire end resistances, any value; T.C.C. 0.1 condensers; on-off switches push-pull; polar ganging devices.

(This advertisement continued on next page.)

**ROLA**  
the World's Finest Reproducers

the Speakers that Put the "Class" in Class B Amplification



High class radio reproduction in its highest form has always been associated with Rola reproducers. Now, this comprehensive range of Class B units ensures your getting quality Class B Amplification.

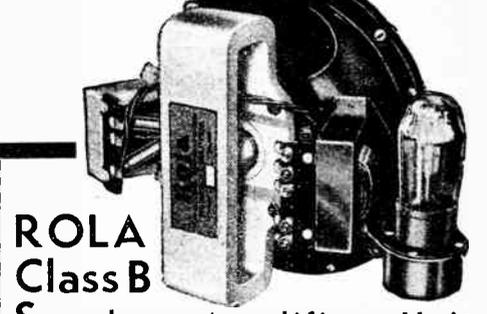
For MULLARD P.M. 2B, B.T.H. PD220, COSSOR 220B, STANDARD 13 B1, HIVAC B220, MARCONIPHONE B21, G.E.C. B21, CLARION B22.

ROLA FR5 PM-33 Class B	29/6
ROLA FR6 PM-23 Class B	39/6
ROLA F6 PM-23 Class B	49/6
ROLA F7 PM-23 Class B	60/-

For COSSOR 240, FERRANTI HP2, CLARION B24.

ROLA FR5 PM-32 Class B	29/6
ROLA FR6 PM-22 Class B	39/6
ROLA F6 PM-22 Class B	49/6
ROLA F7 PM-22 Class B	60/-

All Prices include Transformer.



**ROLA Class B Speaker Amplifier Unit**

Without alteration to his set any battery set owner can increase its volume about 5 times in 5 seconds by connecting this outstanding Rola unit.

Model A—For Mullard P.M. 2B, B.T.H. PD220, Cossor 220B, Standard 13B1, Hivac B220, Marconiphone B21, G.E.C. B21, Clarion B22. Model B—For Cossor 240, Ferranti HP2, Clarion B24.

**PRICE (Both Models less Valve) 57/-**

**EXTENSION SPEAKERS**  
There is a correct Rola Extension Speaker for practically all British radio receivers. Write for list.

**THE BRITISH ROLA CO., LTD.**  
MINERVA ROAD, PARK ROYAL, N.W.10  
Phone: Willesden 4322-3-1-5.



## TWO POINTS about HARTLEY - TURNER

1. Dozens of people who visited the Manchester Show told us that the HARTLEY - TURNER SPEAKER sounded far more realistic than any other speaker there.

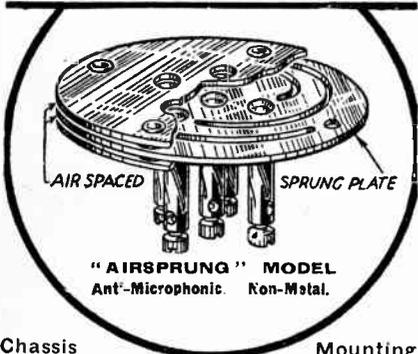
2. Dozens of people discussed "good reproduction" with us. More than ever we realised that the most ardent amateur seekers after realism have usually still a long way to go before getting really faithful reproduction.

HARTLEY-TURNER users have got it. They took the trouble to come and tell us that our speaker is "SIMPLY WONDERFUL." IT IS; and "New Notes in Radio" (sent for a 1d. stamp) tells you all about it.

Demonstrations any time by appointment.

**HARTLEY - TURNER RADIO LTD.**  
Thornbury Road, Isleworth, Middlesex  
Telephone: Hounslow 1854.

## CLIX CHEAPEST PERFECT CONTACT



"AIRSPRUNG" MODEL  
Anti-Microphonic Non-Metal.

## Chassis Mounting VALVEHOLDERS Specified for the "A.V.C. THREE"

Clix New 'Airsprung' Anti-microphonic Valveholder is designed to—

- Damp out actual physical shocks to the valve.
- Insulate the valve from consistent vibration set up by the transformer on the chassis.
- Counteract and absorb the air pulsations set up by the increased acoustic output of modern receivers.

- "AIRSPRUNG" TYPE  
 \*5 pin - 1/3  
 4-pin - 1/2  
 FLOATING TYPE  
 \*7-pin - 1/-  
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 4-pin - 8d.  
 5-pin - 9d.  
 \*As Specified.

"A MATTER OF CONNECTION."  
Clix New Folder "W" gives details of over 30 Perfect Contact Components. Write for a copy now

Lectro Linx, Ltd., 79a Rochester Row, S.W.1

### Components, etc., for Sale.—Contd.

(This advertisement continued from previous page.)  
**K**OLSTER BRANDES Gramophone Motors, dual type, can be worked by clockwork or mains, No. 1 induction type 100-250 volts, 27/6; No. 2, A.C. and D.C. 100-250 volts, 27/6; both the above complete with all fittings and turntable.  
**S**PECIAL Offer.—Microphones by prominent manufacturer, high sensitivity, uniform response, complete with stand, transformer and battery; listed £3.15, our price 18/6.  
**D**UBILIER Condensers, 300v. working, 4+4+2+2+2+0.1+0.1+0.1, 6/-; 1,000v. working 1 mf., 1/6.  
**P**REMIER British Made Meters, moving iron, flush mounting, accurate; 0-15, 0-50, 0-100, 0-250 milliamps., 0-1, 0-5 amps., all at 6/-.  
**O**RMOND Condensers, 2-gang, semi shielded; 2/6.  
**W**ESTERN ELECTRIC Mains Transformers, input 200-250 volt, output 500-0-500 volt, at 150 milliamps., 4v. 4a., 4v. 2.5a., 4v. 2a., 4v. 1a., 4v. 1a., massive job; 19/6.  
**S**PECIAL Offer of Mains Transformers, manufactured by Philips, input 100-115v. or 200-250v., output 180-0-180 volts, 40 m.a., 4v. 1a., and 4v. 3a., 4/6; 200-0-200v., 4v. 1a., 4v. 3a., 4/6.  
**A**LL Premier Guaranteed Mains Transformers have engraved terminal strips with terminal connections, input 20-250 volts, 40-100 cycles, all windings paper interleaved.  
**P**REMIER H.T.8 Transformers, 250v. 60 m.a., rectified, with 4v. 3.5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 25/-.  
**T**.C.C. 2,000+2,000 Electrolytic, 12 volts working; listed 27/6, at 10/-.  
**P**REMIER H.T.9 Transformer, 300v. 60 m.a., rectified, with 4v. 3.5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.  
**P**REMIER H.T.10 Transformer, 200v. 100 m.a., rectified, with 4v. 3.5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.  
**M**AGNAVON Magna, D.C.144, 2,500 ohms field, with humbucking coil, Pentode transformer, 17/6; complete with A.C. conversion kit, 27/6.  
**D**DOUBLE Spring Motors, made by Garrard, play five sides of 10in. record, complete with turntable and all fittings; 17/6.  
**M**ICHAEL 2-screen Grid Pentode Transportable 4, complete; gets many stations; £6/15.  
**S**PECIAL Offer.—Accumulator chargers, input 200-250v. A.C. to charge 2- and 4-volt accumulators at 1/2 amp.; owing to the high efficiency of the silver oxide rectifier employed charger may be used during broadcast; 9/6 each.  
**R**ELIABLE Canned Coils with circuit; 3/-, accurately matched; dual range.  
**P**REMIER L.T. Supply Units, consisting of Premier transformer and Westinghouse rectifier, inputs 200-250 A.C. output, 8v. 1/2 amp., 11/6; 8v. 1 amp., 14/6; 15v. 1 amp., 19/-; 6v. 2 amp., 27/6; 30v. 1 a., 37/6.  
**P**REMIER Mains Transformer, output 135v. 80 m.a., for voltage doubling, 8/6; 4v. 3-4a., c.t. L.T., 2/- extra; Westinghouse rectifier for above, giving 180v. 30 m.a., 8/6.  
**P**REMIER Mains Transformers, output 250-0-250 volts 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary, 15/-.  
**P**REMIER Mains Transformers, output 350-0-350 volts, 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary, 15/-.  
**P**REMIER Mains Transformers, output 400-0-400 volts, 100 m.a., 4v. 4-5a., 4v. 2-3a., with screened primary, 15/-.  
**P**REMIER A to Transformers, 100-110/200-250 volts or vice versa, 60-watt, 7/9; 100-watt, 10/-.  
**S**PECIAL Offer of Manufacturers' Type Transformers, any input, output 250-0-250 volts, 60 m.a., 4v. 1a., 4v. 3a. (both c.t.), 8/6; H.T.8 transformer, with 4v. 3-4a. (c.t.), 8/6; with rectifier, 18/6.  
**A**MPHION Mains Transformers, input 100-250 volts, output 350-0-350 volts, 120 m.a., 4v. 5a., 4v. 2a., 6v. 1a. (all c.t.); 17/6.  
**F**ILAMENT Transformers, polished and engraved terminal boards, N.P. terminals, 4v. 3-4a., 5/-; 10v. 3a., 6/6; 12v. 1a., 5/-; 4v. 4-6a., 6/6; 14v. 4a., 6/6; 22v. 1a., 6/-; 6v. 2a., 5/-; 9v. 1a., 5/-; 35v. 3a., 15/-.  
**P**REMIER Eliminators, input 200-250 volts, 40-100 cycles, A.C., incorporating Westinghouse metal rectifiers, output 250v. 60 m.a., S.G. and 120v. taps, 42/6; with 4v. 4a. c.t. L.T., 7/6 extra.  
**P**REMIER Eliminators, output 150v. at 30 m.a., S.G., and 100v. taps, with 4v. 3-4a. c.t. L.T., 37/6; or with trickle charger, 42/6.  
**P**REMIER Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps, 27/6; with L.T. trickle charger incorporated, 35/-.  
**P**REMIER D.C. Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps; 15/-.  
**A**CCUMULATOR Chargers, 200-250 volts A.C., all incorporating Westinghouse metal rectifiers; 2, 4, and 6v. at 1/2 amp. 2/6; 2, 4, and 6v. at 1 amp., 17/6; 12v. 1a., 27/6; 6v. 2a., 35/-; 12 v. 1.5a., 30/-; 6v. 3a., 39/6; 30v. 1a., 42/6; 50v. 1a., 62/6.  
**B**.T.H. Induction Type (A.C. only) Electric Gramophone Motors, 100-250 v., 30/- complete.  
**A**MPHION Moving Coil Speakers, type E.M.644, dual fields, 2,500 and 5,000 ohms (100 and 200v.), with output transformer, 12/6; A.C. conversion kit for this speaker, 10/- extra.  
**W**ESTERN ELECTRIC Condensers, 250v. working, 1 mfd. 6d., 2 mfd. 1/-; 500v. working, 1 mfd., 1/-.  
**T**.C.C. Condensers, 250v. working, 4x4x1 mfd., 3/6; 6x4x2x2x2 mfd., 37.5v. working, 6/11; 4x4x1.6 -  
**S**PECIAL Offer of Wire Wound Resistances—4 watts, any value up to 10,000 ohms, 1/-; 8 watts, any value up to 15,000 ohms, 1/6; 15 watts, any value up to 50,000 ohms, 2/-; 25 watts, any value up to 50,000 ohms, 2/6; 50 watts, any value up to 50,000 ohms, 3/6.  
**W**IRE Wound Potentiometers, 15,000 ohms, 1/6; Centralab Potentiometer volume controls, 50,000 ohms, 2/-; Colerstats, logarithmically wound Potentiometers, 6,000 ohms, 1/5.  
**F**OR Callers Only.—The following valves, guaranteed new—  
**T**HE Last Few Western Electric 4211-D Valves, 10v. 3a. filament, 750-1,000v. plate, 50-65 m.a., impedance 3,500 ohms, amplification factor 12; cost £5, to clear at 15/-; 4212-D, 250 watt, £3.  
**P**HILIPS 328 Valves for L.T. Charging, 5/6; 329 Barreter lamps, 2/-.  
**P**REMIER SUPPLY STORES, 20-22, High St., Clapham, S.W.4, Macaulay 2188. Closed 1 o'clock Wednesdays, open to 9 o'clock Saturdays. Nearest Station, Clapham North Underground. [3704

# I tell you EVERYTHING

and save you  
money and trouble



I am the EMICOL Universal Meter. At a glance I tell you everything you ought to know about your set. All voltages, all currents, all resistances. I test every component and detect faults and distortion. No complications, no additional parts, no calculations.

Direct readings of:—

**VOLTS 0 to 150**  
**VOLTS 0 to 6**  
**OHMS 0 to 2,000**  
**MILL-AMPS 0 to 30**

**12/6**  
with full instructions.

### POCKET METERS.

"EMICOL"	"EMICOL"	"EMICOL"
Double reading Voltmeter range 0-6v. 0-150v.	3-in-1 Test Meter (Wates Patent), Range 0-5v., 0-30mA, Price 8/6	4-in-1 Test Meter (Wates Patent), Range 0-6v., 0-15v., 0-150v., 0-30mA, Price 9/6

From all radio dealers, or, in case of difficulty, write direct for literature.



Manufactured solely by:—

Electrical Measuring Instruments Co., Ltd.,  
55, Cardington Street, LONDON, N.1.

## WIRELESS COMFORT FOR 2/11



No longer is it necessary to get up and down to adjust the set. From your seat anywhere in the room you can fade out uninteresting stuff to a whisper with a Modula, and by a turn of a knob adjust the volume just as you like it. A real boon to wireless users. Complete Modula as illustrated with 12 ft. cable 2/11, or with armchair leather strap 4/-. British Pix Co., 118, Southwark St., London, S.E.1.

### WHAT "FREE GRID" in "WIRELESS WORLD" SAYS:—

"The volume control functions beautifully, the control being spread nicely over practically the whole movement of the knob instead of crowded up at one end in the case of some of them."

See page 192, September 1st issue.

THE BRITISH PIX CO. LTD. (DEPT. 18),  
118, SOUTHWARK ST., LONDON, S.E.1.

## MODULA ARMCHAIR CONTROL

# BON MARCHÉ

**BRIXTON, LONDON, S.W.9**

South London's Leading  
Radio Store.

Phone: Brixton 6201.

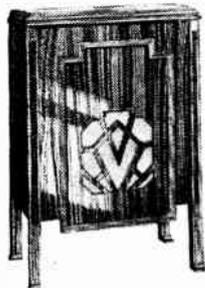
Clearance of Secondhand Surplus  
and Dismantled Receivers bought  
by us in Part Exchange.

Unrepeatable Bargains all on  
3 days' approval against cash!  
Astounding Set Bargains.

**CONVERTERS.**—Janette, E., D.C.C., etc., 200 volts D.C. to 230 A.C.; all as new and guaranteed, worth £10, our price **£4 15**—each, carriage paid. **COMPONENTS.**—Variable Condensers of all types, .0005 air spaced or mica without knobs, 1/- each; H.F. Chokes, all types, 6d. each; good makes. **FERRANTI.**—Trickle Charger, listed 55/-, 2-1-6 volts, 15/-. **UMELLO** Eliminators, H.T. and L.T., 120 v. Metal Case, as new, 19/6. **GARRARD.**—Spring Motor Single Spring on Unit Plate, Handle and Turntable, 12/6. **COLLARO** double Spring Motor, Unit Plate, 20/-. Utah Moving Coil Speakers, new stock 7in. Cone, 2,500 ohm Field, Aluminium type Frame, each 12/6. **PHILIPS.**—L.T. Charger, No. 150 6v., 1.3 amps., 10/6. **PHILIPS L.T. Charger**, 12 volts, 1.3 amps., 18/6. **REGENTONE** Eliminator for H.T., D.C. or A.C. 3 tappings, listed 55/-, our price 10/-. **REGENTONE L.T. Charger**, 250 volt, A.C. Input, 1 amp., 9/6. **EKCO** Eliminator, as new, H.T. and L.T., type C.P. 1, 19/6. **RADIELLE** H.T. Eliminator, 120 volts, 7/6. **L.F. TRANSFORMERS.** Lissen, 4/-; **FERRANTI** AFS, 7/-; AFI, 10/-. **MULLARD** **PERMACORE.** Listed 21/-, guaranteed bargain at 8/6. **Telsen Baby**, 2/6. **TELSEN** Radiogram, 5/6. **POLYMET**, 4 MFD Electrolytic, 2/6 each. Fixed Condensers for smoothing, 25 MFD, 1 MFD, 2 MFD, 8d. each only. **TELSEN**, Titan, Edison Bell, etc. **AERIAL COIL UNITS**, 1/- each, all types.

**SLOW MOTION DIALS**, first class order, for 1 - each. **CONDENSER BANKS**, totalling about 8 MFD 300 v. working, 2/- each. **MAINS TRANSFORMERS**, assorted, 4/6 each. **VALVE HOLDERS.**—Benjamin, Lotus, Telsen, etc., 1 and 5 pin, 3d. each. **EDISWAN** **MINOR** Pick-ups, 10s. each.

**RADIOGRAM CASES** (as illustration on right), Mahogany finish size 38 x 23 x 16 ins., first class bargain, 18/6 each.



**18/6** each.  
Carriage Forward.

**CAMCO.**—Westminster Cases, Radiogram type, Beautiful Grained Walnut finish, new, listed **£8 10**-, our price **£4 10**—each. **LINCOLN** type, for Lowboy Set, listed **£5 15**-, our price **£3 15**—each. **SIX VALVE CHASSIS**, 2 H.F. Stages, detector L.F. and Power output—Long and Short Waves, Kilocycle Dial, one Knob control, combined Volume Control, and on-off Mains Switch, 11 only at special price of **£5 19 6**. (One only **PHILIPS** 1 volt 1 amp. **HEATER TRANSFORMER**, 200/250 volt primary, first class Instrument job as new, only used for test, listed 25/-, our price **8/6** only. One only, and unrepeatable **OSRAM MUSIC MAGNET 4 SET**, as new, and in thorough working order, minus Valves, otherwise perfect, 2 S.G. H.F. Stages, detector, pentode, and for Battery operation, 35/- only. One **PHILIPS** J type Bakelite Speaker, listed at **£5 5**—our price **29/6** only. 4 only. **COSSOR EMPIRE MELODY MAKER RECEIVERS**, complete with Valves, as new, Famous for tone, listed at **£6 15**—our clearance price, **35/-**. (Carriage Paid).

(Carriage paid on orders of 10/- or over.)

**BON MARCHÉ Ltd.**  
**BRIXTON ROAD, S.W.9**

Components, etc., for Sale.—Contd.

**R. SELECTED** Parts for Sale, as new; e.o.d. or "Wireless World" deposit system, which we recommend if in doubt as to the splendid value offered; we take risk of damage in transit to our customers; goods tested for values and guaranteed.

**T.O.** Clear.—K.B. 6v. L.R. m.c. speakers, new, 5/6; Igranic mains transformers, half wave, 550v. 60 m.a., 7.5v., 7.5v., new, 6/-; ditto, 250/250 100 m.a., 4v. 1 amp., 10/6; Varley 250/250 75 m.a., 3-4v., 6v., 17/6; Varley 250 350 90 m.a., 3-4v., 19/6; Parmeko 250 250 60 m.a., 2-4v., 6v., 20/-; Parmeko 275 275 3-4v., 15/9; Vortexia 250 250 120 m.a., 2-4v., 6v., 15/-; Heavyd 250 250 60 m.a., 2-4v., 12/6; H.T. 7, with H.I. transformer and 4v. 6 amp., 20/-; all with 200 250v. input.

**CLARKES** Multi Tapped Pentode Choke, 10/6; Brown Vec units, new, 9/6; R.I. 14 28H chokes 10/6, 7 14H 10/6, second-hand; sliding resistances, 5.5 ohms 3 amp. 10/6, ditto, 180 ohms 1 amp. 10/6, both first grade articles; Marconi small type DPDT switches, 25 amp. 600v., 2/9; heavy brass DPDT switches, 30 amp., 5/9; single Kantark plugs in fuse boxes, 1/-; Magnavox D.C.144, 2,500 ohm speakers, new, Pentode transformer 22/6; British Radiophone 3-gang condensers, new, with proper cover, disc drive and all fittings, 15/9; Triotron 8 mf. electrolytic, 3/6; Polar 2-gang tubs, 6/6; Polar 3-gang tubs, 10/-.

**NEW** Output Transformers Similar to R. and A., ratio 18 23 32, 6/-; Telsen 0.05 mica condensers, 2/3; T.C.C. 0.01 mica type M, 1/-; new Paxolin formers, 1in., slotted, with guides, 8d.; T.C.C. 2 mf., 350v. working, 1/6; ditto, 1 mf., 1/3, new; T.C.C. 4-4, 250v. working, 4/9.

**PAIRS** New Polar Twin S.M. Thumb Drive, 0.0005, complete, 12/6; Telsen 100h. chokes, 3/-; Westinghouse H.T. and A4 rectifiers, with Varley transformers, £2; Cydon 0.0005 double thumb twin extender, 15/6; Cydon single 0.0005 extender, 7/6; Ready Radio 0.0005 extender condensers, new, 3/6; Ormond 65/- type P.M. speaker, complete, 37/6.

**RADIOPHONE** Pots with Switch, 5,000, 10,000, 25,000, 50,000 ohm, 42/6 each complete.

**FERRANTI** Resistances with Holder, 3,000, 15,000, 2/6 each; Varley Power, 500, 5,000, 10,000, 40,000, 2/6 each.

**TRANSFORMERS.** Ferranti A.F.4 8/-, A.F.5cc 21/6, O.P.M.1c 16/6, O.P.M.2 13/-, O.P.M.4c 16/6; B1 choke, new, 13/-; A.F.6 18/6.

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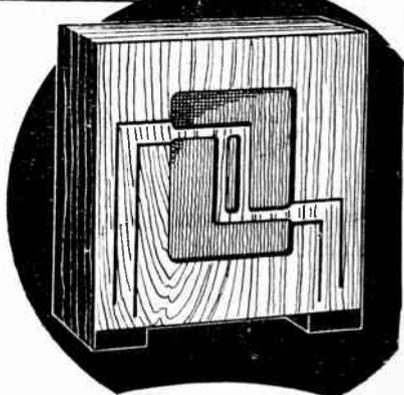
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**W**ESTINGHOUSE Rectifiers, H.T.7, 7/3; 150v. 30 m.a., 6/-; 9 volts 1 amp, 7/6; H.T. chargers, 150v. at 100 m.a., 15/6; L.T. chargers, 6 volts 1 amp, 15 11; 12 volts 1 amp, 19/11; 15 volts 2 amps, 45/-.  
**F**ERRANTI, O.P.3c, O.P.4c, O.P.1, 7/6; O.P.M.6c, O.P.M.5, O.P.M.1c, 12/3; A.P.4, 5/9; A.P.6, 15/-; A.P.5c, 17 6; R.I. superstraightlines, 3/3; hypermus (second-hand), 8/6; Telsen grands, 3/11; ditto, multi ratios, 3/3; Telsen multiratio output transformers, 5 6; ditto, pentode, 4/11; ditto, 1: 1, 4/11; Lewcos L.F.T.4, 3 11; L.F.T.5, 9/11.  
**L**EWCOS Wire Wound S.G. Controls, 1 11; ditto, Colvern, etc. 1/11; volume controls by Centralab, Rotor, etc. 2/3; Wearite, with switch, 3/6; Clarostat, standard types, 2/6; Bradleymoim, E.10, etc., 2 6; Varley power potentiometers, 3 6; pickup faders, 3 11.  
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**D**ISTATONE, 3-valve H.F.-Det.-Pen., complete with Mazda valves, 39/6; another, similar, 35/-.  
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**PATENT AGENTS.**

**A. MATHISEN, B.Sc.**, Patent Agent and Consulting Electrical Engineer, First Avenue House, High Holborn, London, W.C.1. Holborn 8950. [3496]

**PATENTS and Trade Marks, British and Foreign.**—Gee and Co. (H. T. F. Gee, Member R.S.G.B. and A.M.I.R.E.E.), 51-52, Chancery Lane, London, W.C.2. Phone: Holborn 1525. [0001]

**PATENTS.**

**T**HE Proprietor of British Patent No. 230642, relating to "Improvements in radio telephone signalling," is desirous of entering into negotiations with one or more firms in Great Britain for the purpose of exploiting the invention either by sale of the patent rights or by the grant of licences on reasonable terms; interested parties who desire further particulars should apply to Dr. Albert L. Mond, 19, Southampton Buildings, Chancery Lane, London, W.C.2. [3643]

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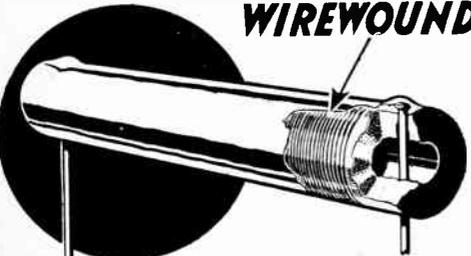
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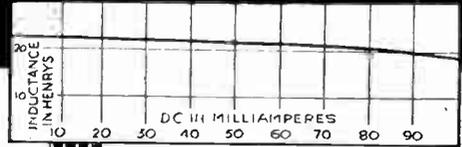
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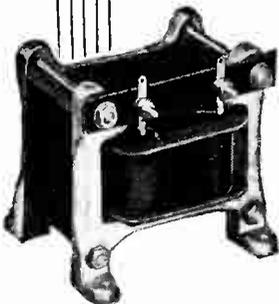
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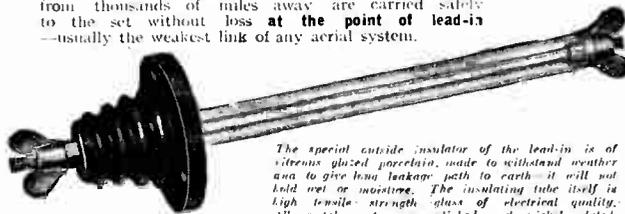
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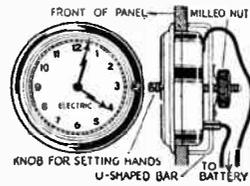
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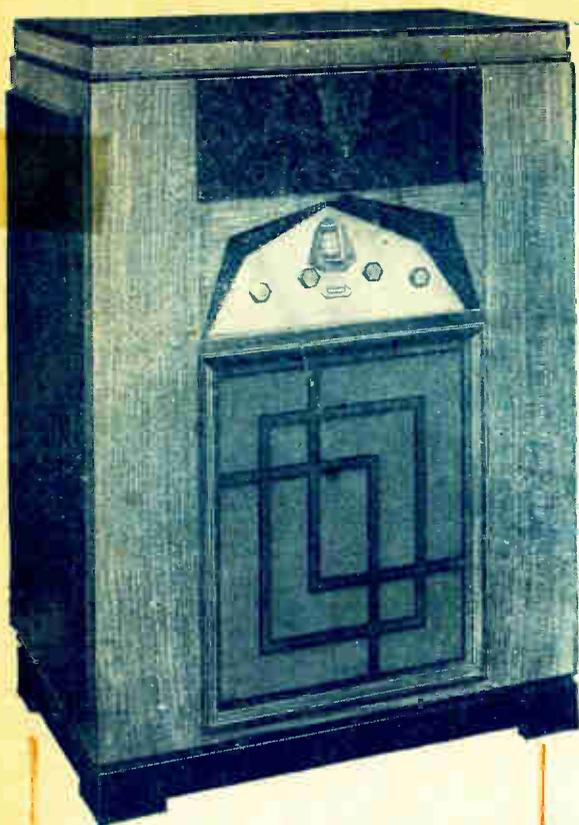
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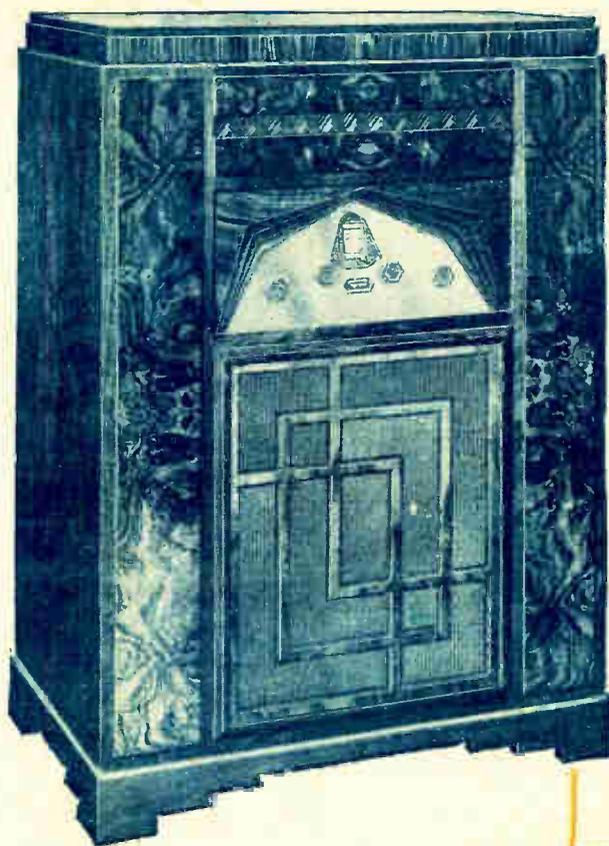
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VIDE "DAILY MAIL," 24th AUG.



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(A.C. only)

Collie Knox, of the "DAILY MAIL," writing in the 24th Aug. issue—  
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# The Wireless World

4<sup>D</sup>

THE PRACTICAL RADIO JOURNAL

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Friday, October 20th, 1933.

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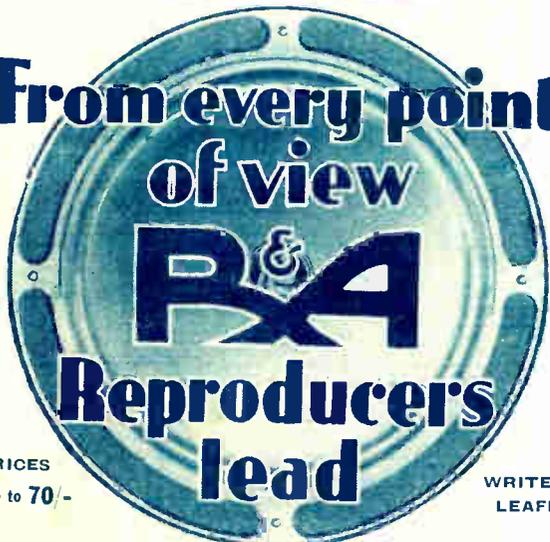
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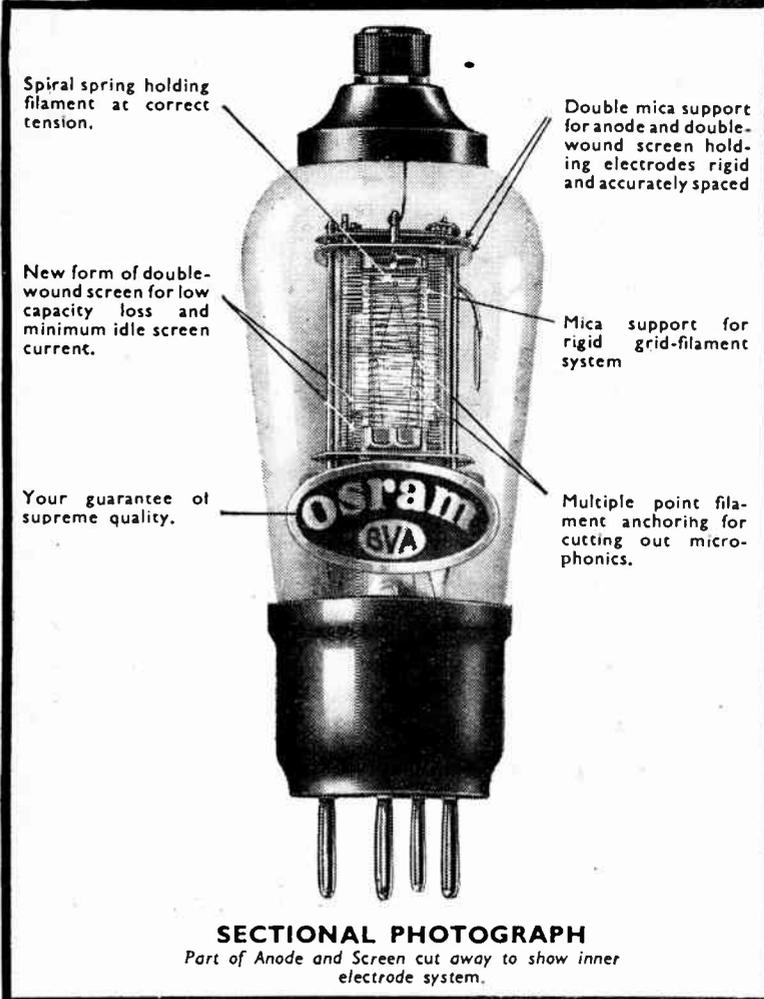


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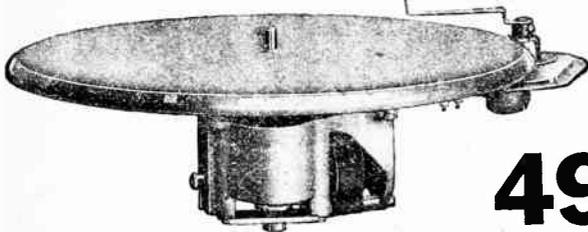
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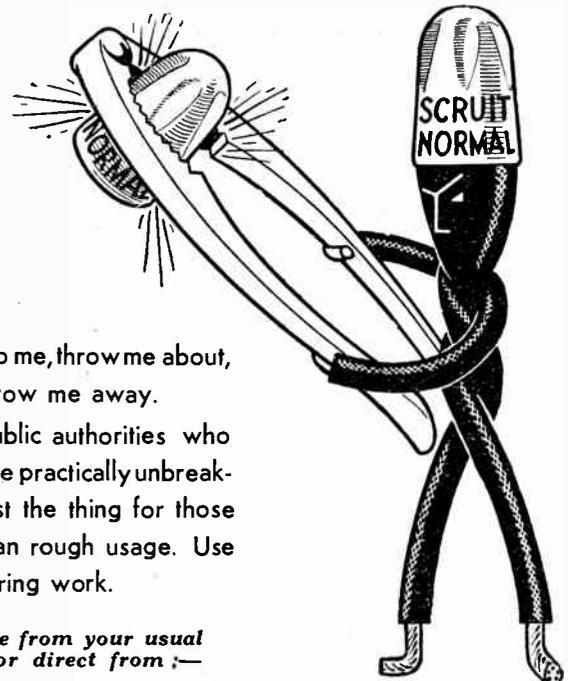
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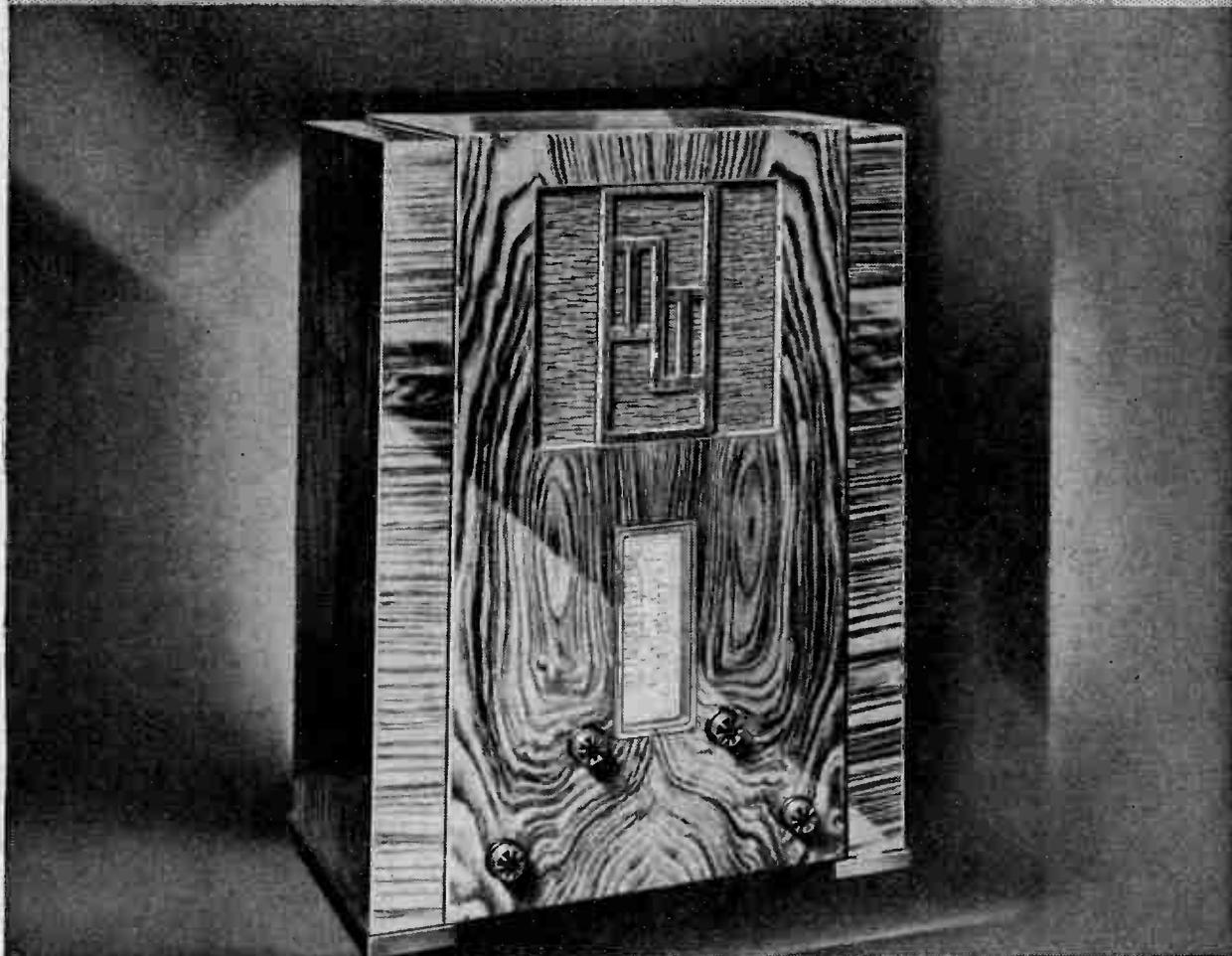
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5th Oct., 1933.

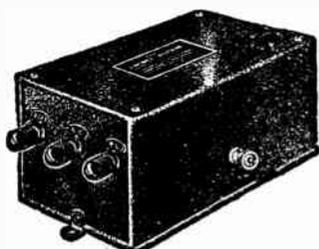
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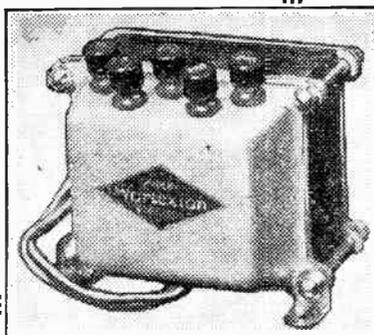
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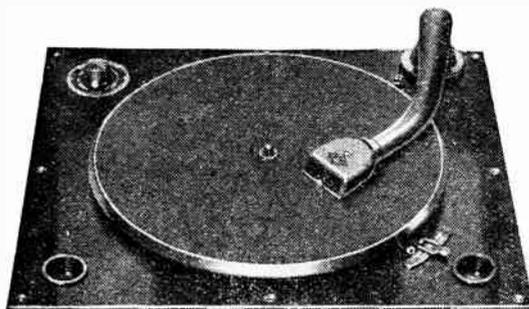
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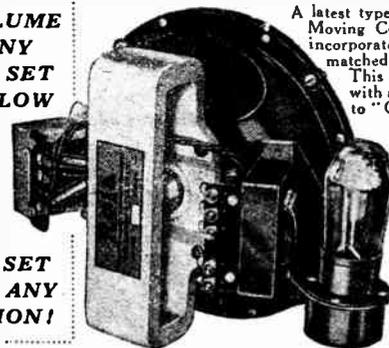
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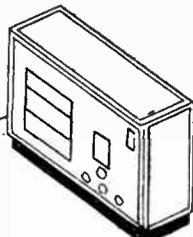


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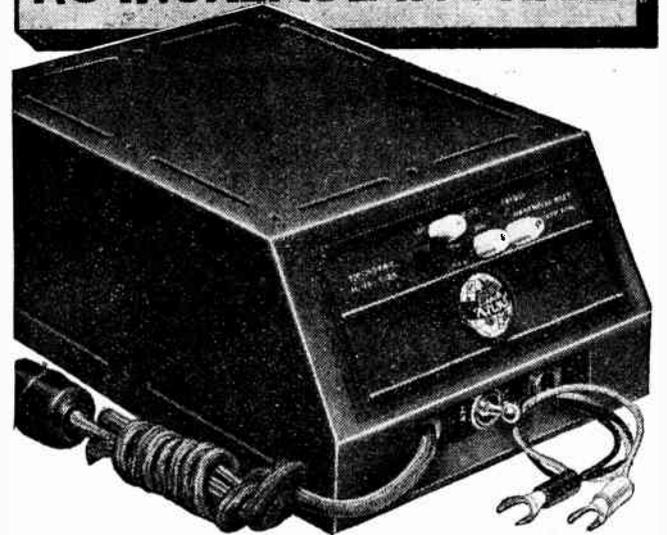
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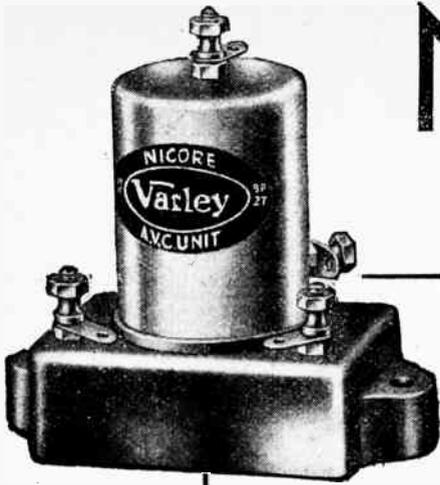
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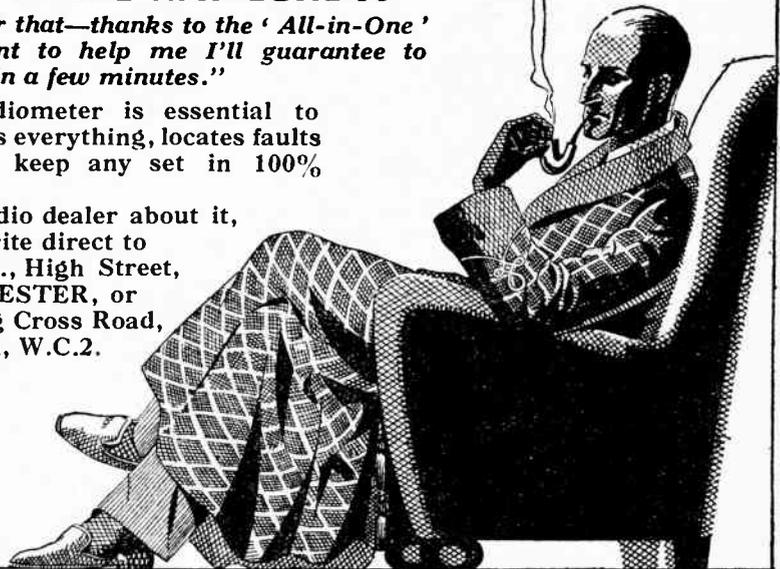
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THE  
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JOURNAL  
23<sup>rd</sup> Year of Publication

No. 738.

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## EDITORIAL COMMENT

### Codicil to Lucerne

#### Technicians Hampered by Political Issues

**T**HE Lucerne Broadcasting Conference was called with every apparent desire on the part of the delegates to set to work to produce order out of chaos and arrange the wavelength distribution of Europe on lines which it was hoped might prove to be foundations of permanence.

The Conference achieved a great deal. A plan was evolved which had every appearance of proving successful, and the majority of the broadcasting authorities of Europe subscribed to it. There were, however, certain exceptions, and in the end it was found that eight countries declined to bring their broadcasting stations into line under the new scheme; and so another conference has just been sitting at Amsterdam with the object of trying to bring in these remaining dissentients.

It requires no great imagination to realise that the success of a new wavelength distribution plan in Europe is dependent upon all countries adopting it and agreeing to abide by the allocation of wavelength made to every transmitter in Europe. Even one or two undisciplined stations can easily wreck a scheme of this nature.

The Amsterdam Conference broke up last week and its result is, unfortunately, most disappointing. Agreement has not been reached, and unless there is a subsequent "settlement out of court," it seems doubtful whether the Lucerne Plan will give any special advantages over the present distribution of wavelengths, because the Plan, in its very conception, depended upon unanimity of acceptance.

Before we attempt to consider the reasons for failure we must refresh our minds as to the constitution of the

Union Internationale de Radiodiffusion, under whose auspices these conferences have been held. The Union is exclusively a technical body. It has no authority to dictate to Governments, nor to interfere with the internal organisation of the Broadcasting authorities. Its purpose is to endeavour to establish broadcasting in Europe on the most satisfactory lines to ensure efficient service to the listeners of each country. Technical improvements in stations and systems are dealt with, but, above all, the problem before the Union has been the allocation of wavelengths to each country on a basis of equity and bearing in mind the paramount necessity for avoiding mutual interference between stations on adjacent wavelength channels.

#### A Political Tool

If these technical matters could be left in the hands of the technical experts to decide we believe that there would soon be found a satisfactory solution. Unfortunately, however, even the Lucerne Plan was subject to the approval of each Government concerned, and here the trouble began. Broadcasting in Europe to-day is no longer guided by the consideration of service to the listener as it once was; it has become a political tool and each Government seems determined that it shall not concede anything to its neighbour. The technical conferences of the Union might carry on for ever unproductively if their work is to become merely subject matter for political disagreement in the end.

The Lucerne Plan, it appears, will still be put into force in January, but it will fall far short of expectations in its scope. Particularly it would seem that on the long-wave band, little or no progress has been made towards a proper solution of the problem of wavelength allocations.

# Simplified A.V.C.

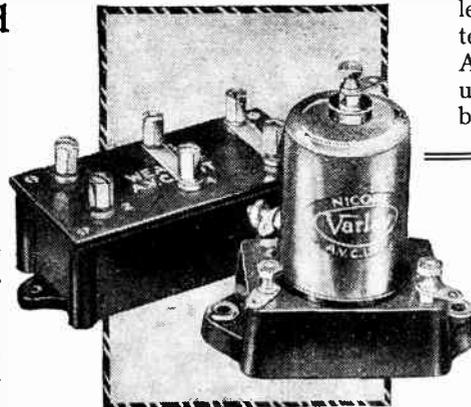
A GOOD deal of attention has been given lately to the subject of automatic volume control so that its inclusion might well be added to the list of modifications wherever it has been decided to retain last season's model for this winter's session. In this article the author explains how the new A.V.C. units can be used to the best advantage.

## How the New Units Can be Applied to Existing Receivers

IT is not always an easy matter to decide how far modifications to an existing receiver can be carried with advantage, for if the set is of an early vintage, alterations that entail considerable expense may not be justified. Yet if the set is to do duty for another season an overhaul, and possibly a few minor alterations, would be well repaid. When reviewing this matter consideration might well be given to the possibility of incorporating automatic volume control, for with the introduction of some inexpensive units it can now be embodied in practically any type of receiver in a simple and

By  
**H. B. DENT**

then fed back to the H.F. or I.F. valves in the form of a negative grid bias. Since this is provided by the carrier wave of the station received it follows that when a strong signal is tuned in, say, one that normally would overload the detector, a negative bias of considerable value is developed; this is passed back to the H.F. stages, restricts the amplification, thereby doing the same work as a manual control.



The Wearite and Varley A.V.C. units mentioned in the text.

The other alteration relates to the grid bias circuits of the valves to be controlled. If the set is battery operated the earth end of the grid circuit would be taken to a tapping on the grid battery, or possibly to a separate grid cell. This lead is removed and extended to connect to the A.V.C. terminal on the unit, and the deposed grid battery inserted between

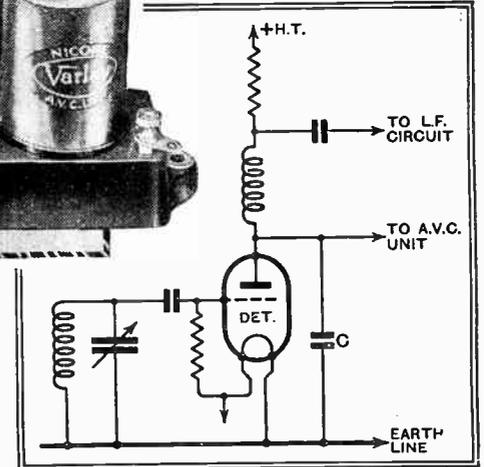


Fig. 2.—When an A.V.C. unit is fitted the by-pass condenser C must be removed.

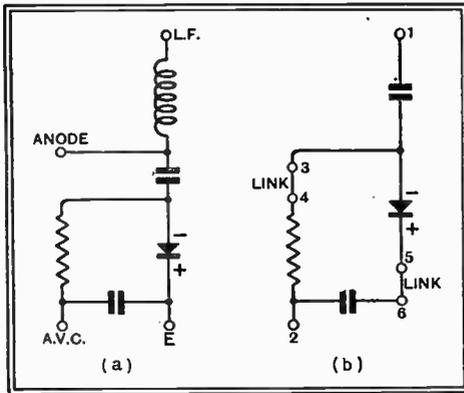


Fig. 1.—Circuit connections of the A.V.C. units showing (a) Varley model, (b) Wearite model.

### Fitting the Unit

In most cases the original detector circuit will include an H.F. by-pass condenser, such as C in Fig. 2, but as this offers an easy path for the H.F. currents, and so virtually short-circuits the unit, it must be removed, as the whole of the hitherto unwanted H.F. in the anode circuit is now required to pass through the A.V.C. unit, where it is utilised to good purpose in providing the control bias. The unit, therefore, detracts nothing from the performance of the set; it is not making use of energy required for other purposes, but only of that which otherwise would be drained carefully to earth.

the unit's earth terminal and the earth line in the set, the change being explained by Fig. 3. Here the grid cell is moved from the old position X to the new position Y.

These circuits show the connections for simple A.V.C. but in the Wearite model the internal connections are so arranged that delayed A.V.C. can be employed if required, the delay voltage being derived from a small grid battery joined to the terminals 5 and 6 after removing the connecting link. There are two other terminals strapped together on this unit, namely, those marked 3 and 4. By removing the link and replacing it by a high-resistance potentiometer the bias voltage fed to the controlled valves can be adjusted to the

straightforward manner. Moreover, the alterations required are of a quite minor nature.

These A.V.C. units, as they are termed, are fitted with the Westector, and one is made by Varley and the other by Wearite. Apart from the fact that their operation is similar, and that the same general principles are involved, the two models have very little in common. For, as will be seen from the theoretical arrangement, Fig. 1, the Varley model includes an H.F. choke, whereas the Wearite model does not; furthermore, the latter has a number of terminals shown joined together by links, their purpose being to widen the scope of the unit and enable it to be used in a variety of different ways.

These units operate in conjunction with the detector valve, and if an H.F. choke is already in use it should be removed when the Varley model is fitted but retained for the Wearite version. The H.F. choke deflects the high-frequency component of the anode current to the A.V.C. circuit, where it is rectified by the Westector into a D.C. voltage; this potential is

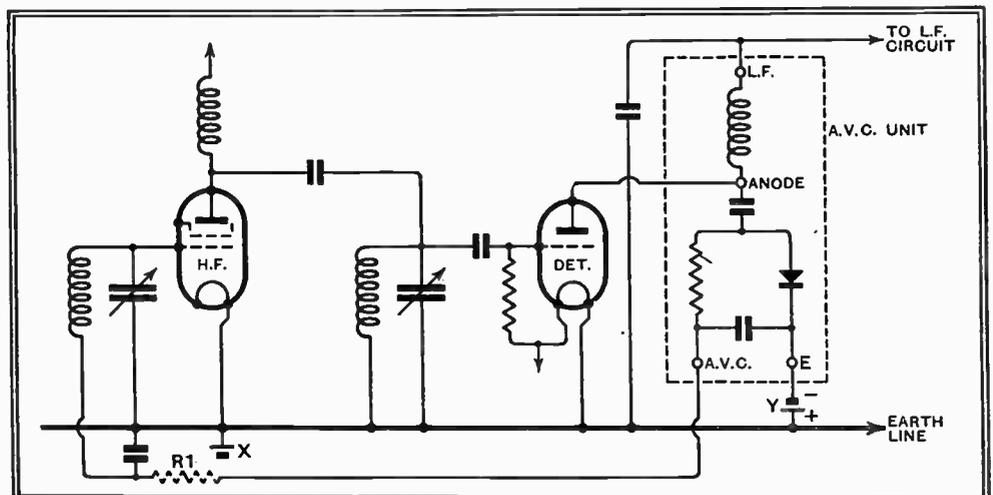


Fig. 3.—Showing the addition of simple A.V.C. to a set; the G.B. battery is changed from X to position Y and if the grid return lead is unduly long a decoupling resistance R1 may be necessary.

**Simplified A.V.C.—**

most suitable value for the best operating conditions. In its simplest form the circuit would be arranged as shown in Fig. 4.

stant frequency. Superheterodynes are enjoying a well-merited popularity in view of their inherent selectivity, so that the units might well be embodied in the de-

catered for. Adding one of these units entails very little alteration, even assuming that an elaboration like delayed and controlled A.V.C. be attempted.

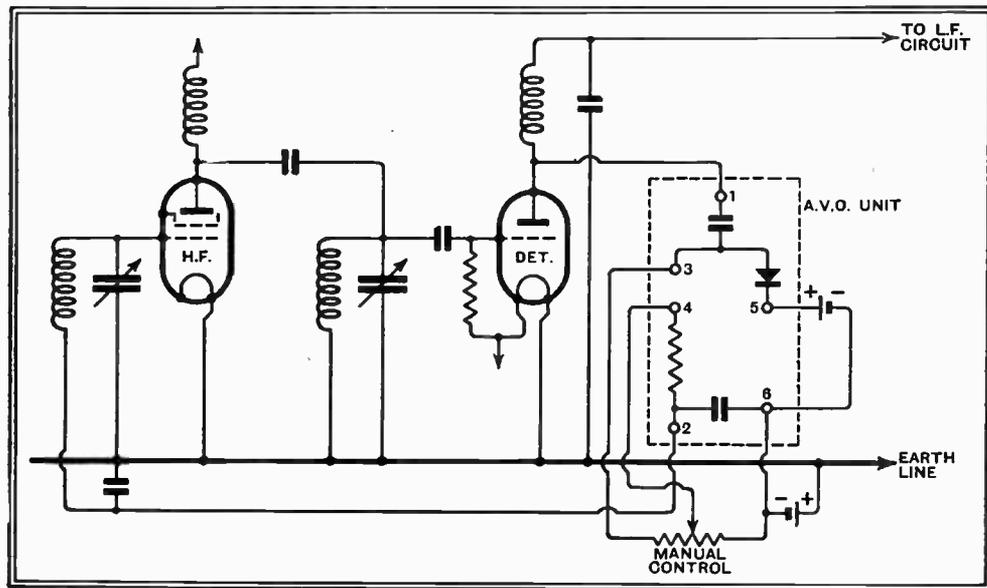


Fig. 4.—Circuit arrangement for delayed and controlled A.V.C.; the manual control is a high resistance potentiometer of 250,000 ohms.

If the manual control is not fitted a fixed resistance of 250,000 ohms should be joined between terminals 3 and 6, but leaving 3 and 4 strapped together.

So far we have limited the discussion to the general application and operation of the units, and straight sets of the more simpler type have served to illustrate these principles. While a fair measure of control is afforded in such cases the particular characteristics of these rectifiers tend to favour frequencies lower than those of the medium broadcast band so that control will be far more marked on the long waves. The curves in Fig. 5 well illustrate this point, and it would seem that the units serve their purpose best in superheterodyne circuits and working in conjunction with the second detector valve where the H.F. potentials are maintained at a con-

sign, or added to existing sets if not so equipped.

They will find, also, a very useful application in the short-wave field where the need for an anti-fading device is so often felt. Consequently, where short-wave converters of the superheterodyne variety are operated in conjunction with a broadcast set, the addition of an A.V.C. unit will prove very beneficial and well justify the small expenses involved. The same would apply to sets in which provision is made for short-wave reception in addition to the normal wavelengths.

Of the more recent *Wireless World* receivers the All Wave Monodial Super could be taken as a very good example of the type of receiver in which A.V.C. is likely to prove most useful, for in this case short-, medium- and long-wave reception is

The skeleton circuit, Fig. 6, shows the essential changes necessary. First, one of the H.F. filter condensers in the anode circuit of the second detector is removed, a lead joined from terminal 1 on the unit to the valve's anode and the grid return leads, hitherto joined to the slider of R10, disconnected and attached to terminal 2 on the unit. A potentiometer of 250,000 ohms is then fitted, and its ends taken to terminals 3 and 6 (after removing the link joining 3 and 4), the sliding member of this is then joined to terminal 4. Terminal 6 is now returned to the slider of R10 and a 1.5-volt grid cell connected in place of the link joining terminals 5 and 6. The grid cell gives the delay voltage and R11 an adjustment for the control bias fed back to the earlier stages.

From the foregoing it will be seen that these small units have a wide field of usefulness, and although only a brief résumé of their application and possibilities has

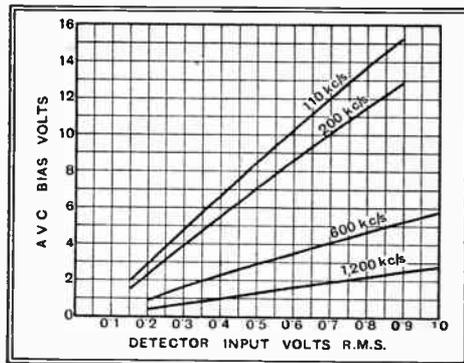


Fig. 5.—Curves showing D.C. output from A.V.C. unit at various frequencies using a leaky grid detector.

been attempted here, it serves to show how one of the latest developments can be most usefully employed in conjunction with existing receivers.

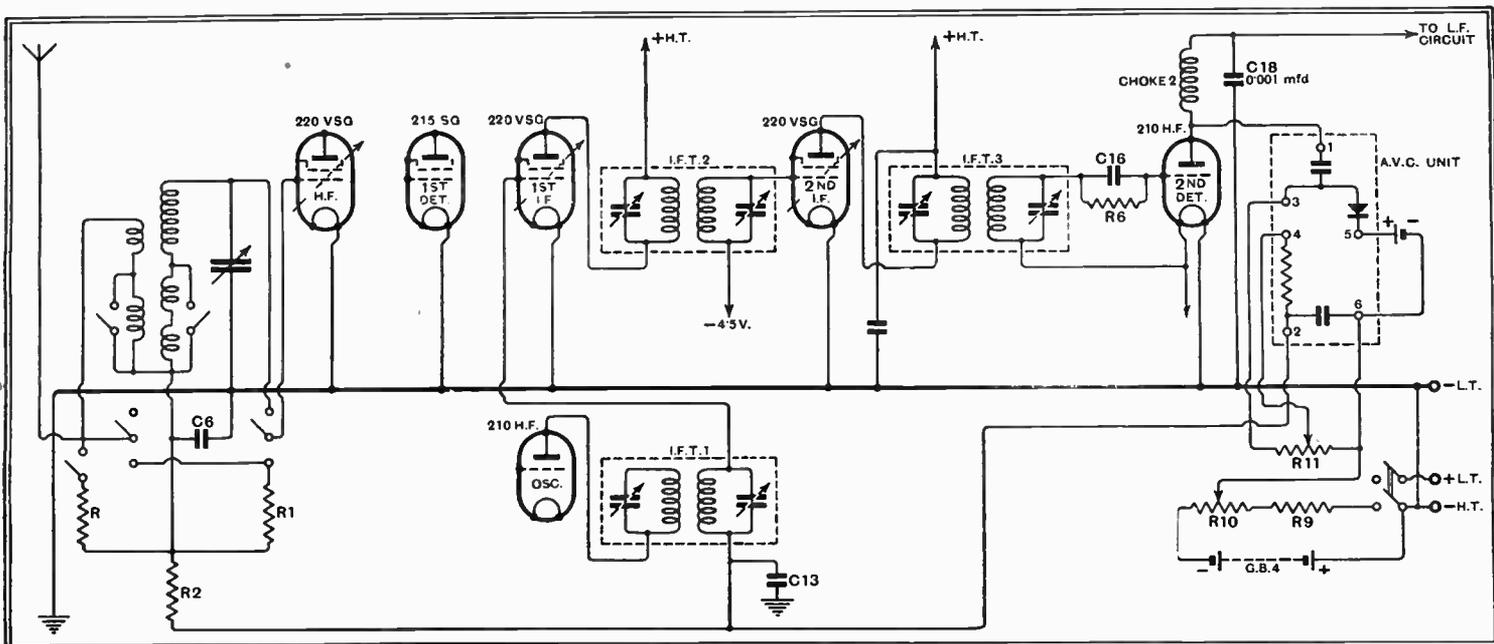
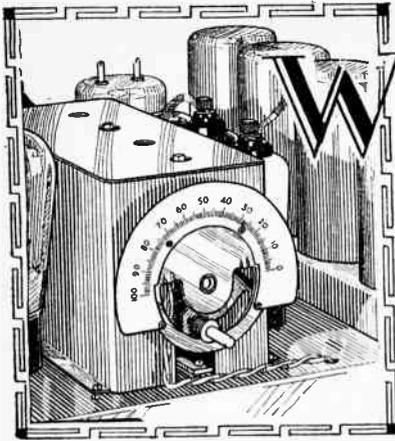
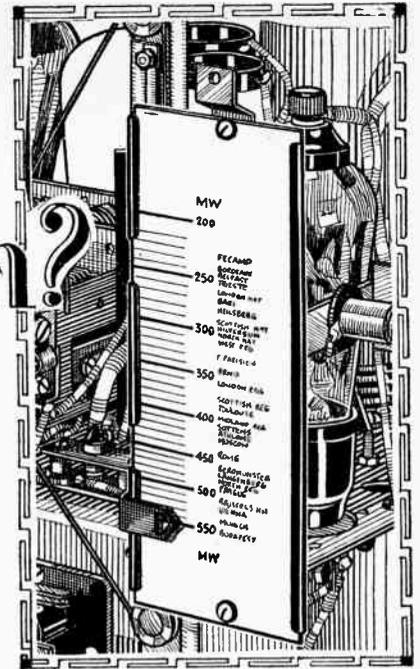


Fig. 6.—Modifications in the circuit of the All Wave Monodial to include delayed and controlled A.V.C., using one of the new units.



# Why Tune by Wavelength?

By R. W. HALLOWS, M.A.



## Numbered Channels : A New Scheme

*SO long as stations remain closely identified with their wavelengths or frequencies, confusion is bound to arise when wavelength changes occur, even of a minor nature. The author puts forward an interesting scheme for the abolition of the familiar scale in favour of numbered channels.*

**G**OOD as it is in most ways, the Lucerne Plan, which is due to come into operation on January 15, raises some rather pretty problems for both set makers and set users. So much use has been made of the station-name tuning dial this season that comparatively few of the bigger sets, of what may be called the domestic type, have anything else. Personally, I doubt whether this kind of dial is really so popular as many manufacturers and designers believe, but that is by the way.

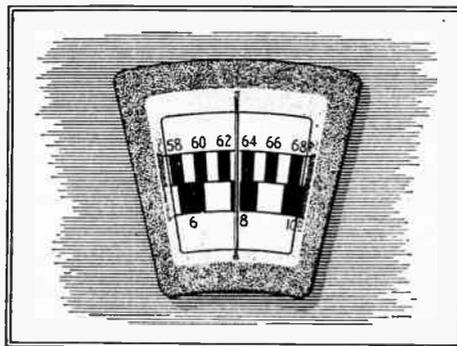
### How Confusion Arises

The really important fact is that any station-name dial which is correctly marked off for present conditions will be utterly incorrect as soon as the Lucerne Plan is in being. Most makers have designed their dials this season so that a new scale showing the "Lucerne" tunings can be substituted at small cost. But this by no means solves the problem. Within a few weeks, for instance, it is probable that Berlin Witzleben will take over Stuttgart's wavelength, whilst Stuttgart will exchange with Munich, and Munich will use the 419.5 wavemetre left vacant by Berlin's move. And it is quite possible that there will be similar wavelength changes or exchanges between stations in other countries between now and the end of the year.

Again, it may be regarded as a certainty that considerable adjustments will be found necessary if and when the Lucerne Plan is put into operation. No one can tell until actual tests have been made whether partners such as Bolzano and Wilno can work harmoniously together on a shared wavelength. Wilno might have to change channels with Tunis or Morocco, whilst the Italian authorities might find it better to make use of the channel for Bari or the second Milan station instead of Bolzano. Any country to which a certain number of channels has

been allotted may find it desirable to alter to some extent the original disposition of its stations. The B.B.C., for example, may possibly discover that better working is obtained if the Scottish Regional exchanges with the Midland, or the North National with the London. Nor is there any reason why (with the consent of the U.I.R., of course) a country should not "swap" one or more of its channels with another.

Though it may be sound enough to arrange for the engraving of one lot of scales now and another for the opening of the Lucerne Plan, it would clearly be uneconomical, even if it were possible, to provide for an indefinite number of replacements. Hence, as time goes on, the existing station-name scales must become less and less correct.



The suggested new tuning dial. The medium- and long-wave divisions each cover a width approximating to that of a frequency channel.

Can some means be devised for retaining the simplicity of station-finding furnished by the "name" dial, and at the same time avoiding the necessity for constant replacements—or the alternative of increasing inaccuracy as month follows month? I believe that it can, and the purpose of the present article is to suggest a method which appears to have many important advantages.

A wavelength marking off for the tuning dial is unsatisfactory, since with the logarithmic variable condenser now used in almost all sets it leads to uncomfortable crowding in some portions of the scale; and, after all, the Lucerne Plan, like its immediate predecessors, has a frequency basis. Then why not kilocycles? The man in the street has demonstrated in the most emphatic manner in the world that, despite the several campaigns that have been made in their favour, he declines utterly and absolutely to think in kilocycles. He has an instinctive distrust of anything that works "widdershins," and to him it is absurd to demonstrate that Fécamp should be higher in the scale than the London National, when he knows that it is lower!

Why not abandon metres and kilocycles alike both for the marking off of tuning dials and for the "ranking" of stations in the printed lists? If the Lucerne Plan is founded upon the kilocycle it has also another even more important basis, the channel. I suggest that if we adopted channel numbers both for tuning dial calibration and for the order of stations in the lists, a great simplification would occur, and the dial problem that now faces designers would cease to exist.

### Numbering the Channels

In the United States of America, where a 10-kilocycle separation between stations prevails, something of the kind already exists, and it is found to work most satisfactorily. There 840 kc/s is known as Channel No. 84, 850 kc/s as Channel No. 85, and so on. With our nominal 9-kilocycle basis we cannot assign channel numbers by the very convenient process of knocking off the final nought from the kilocycle figure. But there seems to be no good reason why the European channels should not be numbered.

Under the Lucerne Plan there are 130

**Why Tune by Wavelength?—**

channels, occupied by 232 stations, existing or projected. Fifteen of these channels are on the long waves, between 1,100 and 1,875 metres; six on the intermediate waves between 696 and 845 metres; and 109 on the medium waves between 200 and 578 metres. My proposal is that these channels should be numbered straight down from No. 1 on 1,875 metres to No. 130 on 200 metres.

The Lucerne list for the long-wave stations would thus read as follows:—

Channel No.	Station.
1	Brasov.
2	Radio-Paris, Syria.
3	Moscow I.
4	Angora, Kaunas, Madrid I, Reykjavik.
5	Konigswusterhausen.
6	Daventry.
7	Minsk.
8	Motala.
9	Huizen, Kharkov.
10	Warsaw.
11	Kalundborg, Portugal.
12	Leningrad.
13	Oslo.
14	Lahti.
15	Moscow II.

Channels Nos. 16 to 21 would be for the intermediate stations; the top of the medium-wave list would begin:—

Channel No.	Station.
22	Hamar, Innsbruck.
23	Ljubljana, Tampare, Finnish C.W.
24	Bolzano, Wilno.
25	Budapest.
26	Beromunster.
27	Athlone, Palermo, Italian C.W.
28	Muhlacker.
29	Madona, Tunis.
30	Vienna.

The Midland Regional would be shown as occupying Channel No. 49, Berlin No. 57, the London Regional No. 61, Hilversum No. 74, and so on down to the 200-metre International Common-wave on Channel No. 130.

It is unlikely that any commercial sets will be made to take in the intermediate channels (Nos. 16 to 21) on wavelengths between 696 and 845 metres, since most of these are assigned to stations comparatively unimportant from the point of view of the British listener. If, therefore, the suggested scheme is adopted his tuning dials will contain two scales, one from Channel No. 1 to Channel No. 15, and the other from Channel No. 22 to Channel No. 130, or as far "down" as the circuits of the set will tune.

At this point it may be well to consider several objections that may have been brewing in the reader's mind. He will already have thought that the long-wave channels are not assigned on a 9-kilocycle basis; and again that, whereas the separation is 8 kc/s in the majority of cases, it is 7 kc/s in some and 9 kc/s in others.

It is not suggested that the dial should be marked off into precise *points*

at which any station will be found. The channel covers a certain frequency-width, and my idea is that the markings should be, as shown in the accompanying drawing, alternate black and white areas of a width corresponding approximately to that of the channels. That is, Daventry will be found within the limits of the light space numbered 6, Huizen within those of the shaded space numbered 9, and so on.

**Ease in Tuning**

If for the long-wave stations the dial spacing is laid out on an 8-kilocycle basis throughout, there will be very little error, as is shown by the following table.

Channel No.	Actual Frequency (K.C.).	Frequency at 8 K.C. Separation.
1	160	160
2	167	168
3	175	176
4	183	184
5	191	192
6	200	200
7	208	208
8	216	216
9	223	224
10	230	232
11	238	240
12	245	248
13	253	256
14	262	264
15	271	272

Since the whole channel would occupy a fairly large space on the tuning dial, and the mid-point of this space would correspond to the calculated frequency, there would be no difficulty in tuning in a desired station or in identifying one that had been tuned in, provided, of course, that the makers' calibration was reasonably accurate.

On the medium waveband the basic channel separation is 9 kilocycles, though in about a dozen instances this is increased

to 10 kilocycles. All of the 10-kilocycle separations, however, occur between 251 and 559.7 metres (Channels Nos. 96 and 24); a satisfactory degree of accuracy in tuning would therefore be obtained if the designer made the mid-points of the channel spaces on his dial correspond to a frequency separation of about 9.2 kilocycles between these limits.

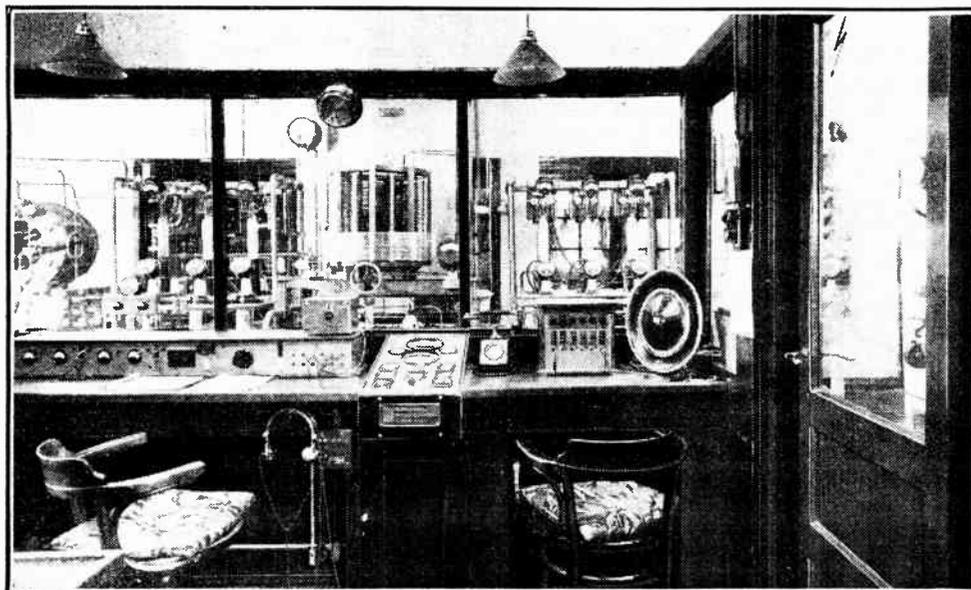
The beauty of the numbered channel system is that the correctness of the tuning dial is utterly unaffected by internal channel exchanges made by any country, or by "swaps" between country and country. Nor is the listener troubled by small adjustments of the frequency of any channels. He is never called upon to memorise anything greater than a three-figure number for any station, and the non-technical man can forget as soon as he likes all about metres and kilocycles, which are in any event meaningless terms to him.

**Do you Agree ?**

The expert does not suffer, for he can readily calibrate his set by means of the division or degree scale for accurate work, making use of the channel markings only as a rough guide.

If manufacturers and the broadcasting authorities will co-operate, there is no reason why the suggested scheme should not be adopted without delay. There is no question that its adoption would simplify matters for the set maker and the set user alike. The scheme has been maturing in my mind for some months now, and I can see no valid objection to it. One is always apt, though, to turn one's own geese into swans. Readers may see some flaw that has not occurred to me, and their opinions on the subject will be most valuable.

Much of the value of the scheme would be lost if it were not widely adopted; all programmes and station lists should refer to "channel numbers."

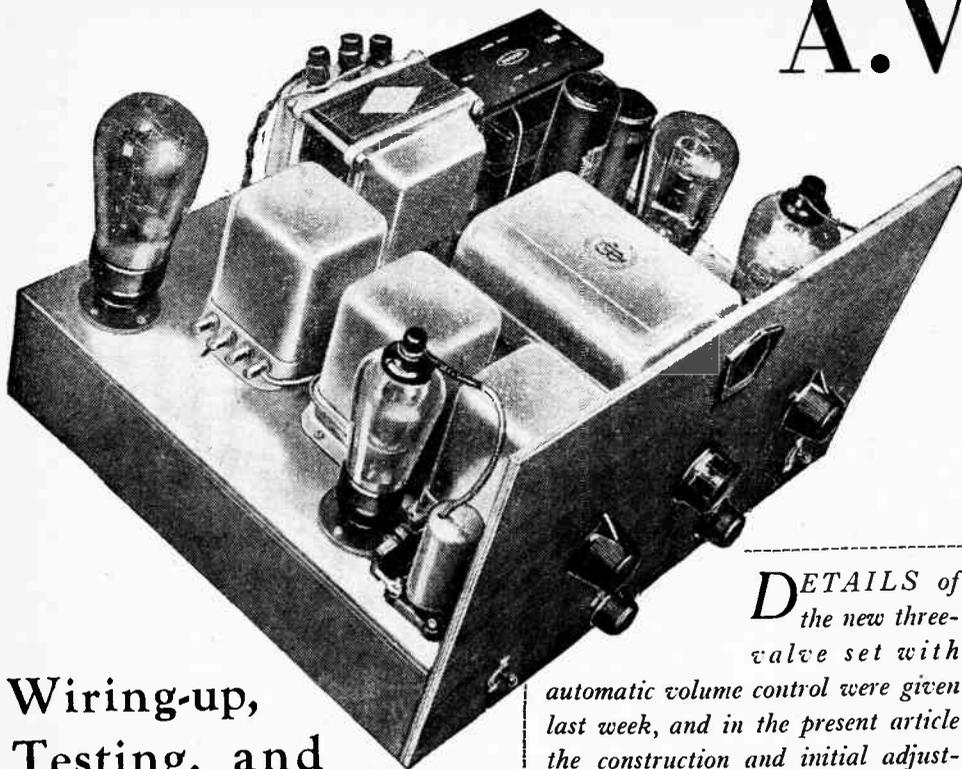


OCCUPYING "CHANNEL No. 9." The control desk at the Huizen medium-wave station, one of the most popular continental transmitters among listeners in this country.

# "The Wireless World"

# A.V.C. Three

## An A.C. Mains Set with the Latest Automatic Volume Control



### Wiring-up, Testing, and Operating Notes

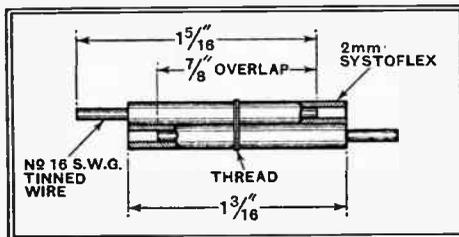
**C**ONSTRUCTIONALLY, there is little to cause difficulty in assembling the receiver. It will be found that many of the terminals on the coils cannot be reached with the gang condenser in position, and it is recommended, therefore, that the mounting of this component be left to the last. The leads to its terminals should be attached before mounting, and it may then be easily dropped into place and connected up. It should be noted that the electrolytic condensers C17 and C18 must be insulated from the metal chassis, since there is some 50 volts difference of potential between the condenser cases and the chassis. The insulation is most easily achieved by mounting the condensers on a small strip of insulating material with a strip of copper foil beneath the condensers themselves for the negative H.T. connections. Large clearance holes can then be drilled in the chassis and the condenser assembly mounted in place.

#### The Filter Coupling

The condenser C1 remains to be dealt with. No component with a sufficiently small capacity is available, and it is necessary for it to be home-made. A minute capacity will suffice, and two  $1\frac{5}{16}$  in. lengths of No. 16 gauge wire form the plates. One end of each wire is soldered to the terminal tags of the fixed plates of the gang condenser sections, tuning the filter, in such a way that the wires overlap by about  $\frac{3}{8}$  in. A piece of thin sleeving is then slipped over each wire to insulate them from one another,

*DETAILS of the new three-valve set with automatic volume control were given last week, and in the present article the construction and initial adjustments are dealt with, while attention is also paid to the operation of the receiver. Although several controls are included, only two are strictly used for tuning, the rest requiring but occasional adjustment.*

and the two tied together to keep them in place. Should it be found on test that the sensitivity of the set falls off excessively on wavelengths above 500 metres, the overlap of the wires should be increased slightly. Conversely, if the selectivity falls off at one end of the scale to any great extent, the overlap should be reduced. It should be pointed out that if care be not exercised in the wiring of the filter circuits, the stray capacities



The filter coupling condenser C1 is constructed from two overlapping lengths of No. 16 gauge wire, and is supported by soldering it to the connecting tags of the gang condenser.

existing here may themselves be too high for correct coupling, and without C1. With the normal arrangement of the wiring, it should be possible without any condenser C1 to receive stations over the whole waveband, but the general sensitivity will be low and the selectivity high.

The initial adjustments are confined to the ganging, and this can readily be

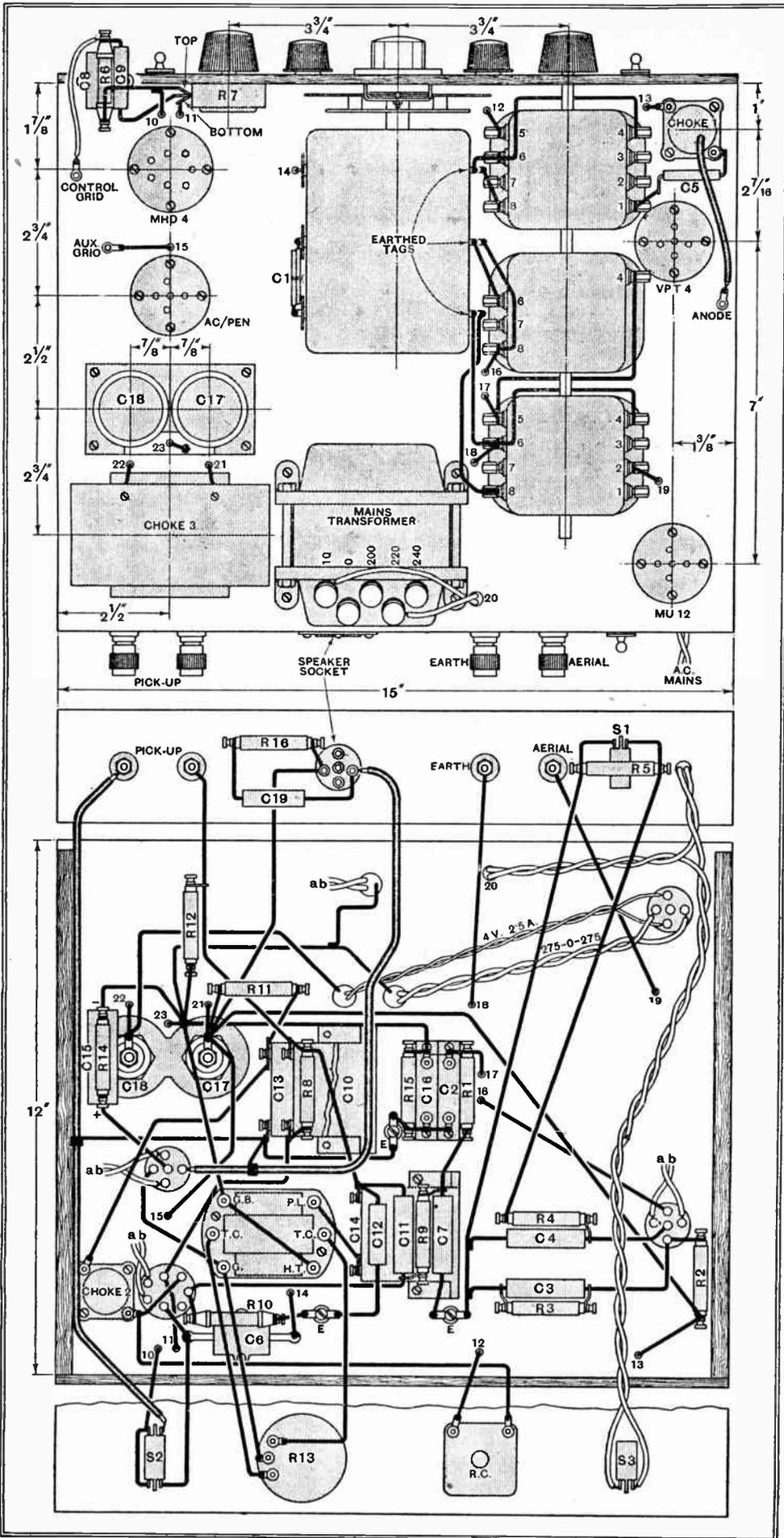
carried out by operating the star-wheels on the gang condenser. The local-distance switch S1 should be closed to give maximum sensitivity, and a station on a very low wavelength tuned in, using as much reaction as possible without the set actually oscillating. If the station be strong enough to bring A.V.C. into action, a meter connected at the point "X" on the circuit diagram must be used as an indicator of signal strength. A meter with a full-scale reading of about 10 mA. is suitable, and the lower the current registered when the set is tuned to a signal the stronger is that signal.

If no meter be available, then a very weak station must be chosen for carrying out the adjustments, so that A.V.C. is inoperative. Each trimmer must be adjusted for optimum signal strength, using as little capacity as possible in any trimmer. If too much trimmer capacity be used the wavelength range will be restricted, and it will be impossible to tune down to 200 metres. If it be found, therefore, that all trimmers are some distance from minimum, they should all be unscrewed slightly, the station retuned at a slightly higher dial setting, and the set re-ganged. The final result should be the trimmer on the intervalve circuit nearly fully unscrewed.

#### The Action of A.V.C.

In general reception the receiver will be found to behave normally on weak signals, for A.V.C. is then inoperative owing to the delay action. When a signal is fairly strong, however, it will be found that reaction makes no appreciable difference to the volume, for the increase of signal strength brought about by the application of reaction is offset by the increased grid bias on the H.F. valve, which results through the employment of A.V.C. On a moderately strong signal the only result of applying reaction is to increase the selectivity and sideband cutting. If interference be experienced, therefore, it may often be avoided simply by increasing reaction without the necessity for simultaneously reducing the volume control setting as in older receivers. The tone will become deeper on applying reaction, and a variation in the setting of the tone control may be needed to offset this.

# How to Wire Up the Receiver



Owing to the wide range of control afforded by the tone control transformer and its resistance R13, only slight pentode compensation is necessary; as a result, full compensation for critical reaction becomes possible and good quality is obtainable even on weak stations. On gramophone, of course, where there is no sideband cutting, the tone control will normally be used at the other end of its range to reduce the upper frequencies rather than to accentuate them. Incidentally, the manual volume control is operative on both radio and gramophone.

Owing to the necessity for applying H.F. potentials to the grid of the duo-diode triode in order to obtain reaction, the input handling capacity of this valve is reduced to about one-half of its normal figure. There is thus a danger of overloading occurring on a strong local station, and to avoid this the local-distance switch S1, which permits an additional 2,000 ohms bias resistance to be thrown in the cathode circuit of the H.F. valve, is fitted. In operation it will be found that the setting of the manual volume control has a slight effect upon the quality of reproduction, and this is unavoidable on account of the necessity for applying H.F. potentials to the control grid, for the presence of C8 means that low and medium frequencies are attenuated by the control more rapidly than high. Owing to the inclusion of tone control, however, this is considered unimportant, for if the tone becomes too high-pitched on reducing volume it is the work of a moment to restore the normal balance with the tone control.

### The Performance

It will be found that the set at first appears less sensitive than the usual three-valve receiver due to the effect of A.V.C. in reducing the amplification on strong signals. A little testing, however, will soon show that the station-getting properties are normal, and that full volume can be obtained from the more powerful Continental stations. On test the receiver proved fully up to standard, and many distant stations were obtainable at a strength and with a degree of quality sufficient for their programmes to be of entertainment value.

The quality of reproduction obtainable, of course, depends to some extent upon the speaker employed, but, owing to the inclusion of tone control, considerable latitude is permissible. No provision is made in the design for the energisation of a moving-coil speaker field, since this would necessitate a rectified output of over 400 volts, and would greatly increase the cost of the mains equipment. The speaker should be fitted with pentode-type output transformer of such ratio that the average primary impedance is about 8,000 ohms.

If the best results are to be obtained a

Full-size blue print of this receiver is available from the Publishers at 1s. 6d. each, post free.

The layout of components and the method of wiring *The Wireless World* A.V.C. Three can readily be seen from these drawings.

**"The Wireless World" A.V.C. Three—**

good aerial is recommended, and on the reception of a fading station it will be necessary to make full use of reaction if the A.V.C. system is to counteract fading to any great degree. A.V.C. can only maintain a constant output on a fading station if the initial sensitivity of the set is sufficient to maintain the output when the signal is at its weakest. The more sensitive the set, therefore, the better the A.V.C. action, and in the case of a simple three-valve arrangement it is necessary to make full use of reaction. Owing to the presence of the tone control transformer this need not affect the quality of reproduction.

*A specimen receiver will be available for inspection by readers at 116 Fleet Street, E.C.4.*

TABLE OF VOLTAGES AND CURRENTS

Valve.	Measured Volts.			Measured Current mA.	
	Anode.	Screen.	Grid.	Anode.	Screen.
H.F. V.P.T.4 .. .. .	170	75	1.5	5.7	2.4
Det. MHD.4 .. .. .	200*	—	—	4.28	—
Output Pen.4.VA.. .. .	242*	256*	20	35	3.9

\* Measured from — H.T.  
Volts across C18 = 280 volts.  
Volts across C17 = 256 volts.  
Heater volts = 4 volts R.M.S.  
Mains voltage = 235 volts R.M.S. (connected to 230 volts tapping).

Total current through Ch3 = 54.5 mA.

All readings taken with Avometer and with the set tuned to no signal.

# News of the Week

## Current Events in Brief Review

### Business or Pleasure

THE most striking piece of electrical apparatus at the Concours Lépine, or Small Inventors' Exhibition, in Paris, was a sewing machine convertible into a wireless set.

### Short Waves for the R.A.F.

THE R.A.F. appears to be deserting the long wave band in favour of the higher frequencies. We learn that, for long-distance communication in the East, the 20-100 metre band is coming into use. A special three-valve receiver has been designed with an amplifier employing two stages of screen grids in push-pull.



**"TO GUGLIELMO MARCONI."**—This bronze statuette—28in. high—has been presented to Marchese Marconi by the American Radio Industry in recognition of his "contribution to the enrichment of human life."

### "Empire Broadcasting" from Denmark

DENMARK is shortly to have an "Empire" broadcasting system similar to the B.B.C. model. Special programmes will be broadcast on short waves from Skamlevaek.

### Arctic Broadcasting

THE world's most northerly broadcasting station is now being built at Vardo, in Norway. This transmitter in the Arctic will be connected to the Oslo station by combined line and radio link.

### Simple but Good

CHILE has evolved a new call sign scheme. After the letters "CE" a station call number is allotted, based on the frequency. Thus, CE58, Santiago, operates on 585 kilocycles, CE88, Valparaiso, on 885 kilocycles, CE92, Temuco, on 925 kilocycles.

### South Pole Calling

REGULAR broadcasts from the forthcoming expedition of Admiral Byrd to the Antarctic are to be relayed by the Columbia network in America, but without doubt many amateurs will tune in direct to the Expedition's three transmitters. These have been allotted the frequencies of 6,650, 6,660, 6,670, 8,820, 8,840, 13,185, 13,200, 13,230, 13,245, 13,260, 17,500, 17,620, 21,515, 21,600 and 21,625 kilocycles.

### Daily Television

TESTS with 30-line television are now being carried out daily from the Crystal Palace on 6.25 metres, but no set schedule has been arranged. The transmissions are being picked up at good strength up to a radius of 30 miles, and it is interesting to note that better results have been achieved farther afield with single-valve receivers than with multi-valve receivers in the near neighbourhood. Not all observers use television receivers, as, of course, it is quite possible to recognise the transmissions on ordinary sets. We shall be glad to receive reports from our readers who have picked up the tests.

### More Power from U.S.

THREE leading American broadcasting stations are already claiming a power of 50 kW as permitted under the new Federal Radio Commission regulations. They are WBZ, Boston-Springfield, WHAM, Rochester, N.Y., and WGN, Chicago.

### Moonbeam Wireless

MOONLIGHT in Italy operated relays which illuminated the Chicago Exhibition on "Marconi Day," October 3rd, when the famous inventor attended the Show and received messages of congratulation from all over America. The selected moonbeam was picked up at the Observatory Arcetri, in Tuscany—the last residence of Galileo—and made to operate a photo-electric cell.

### The Unfinished

WHETHER the Dutch Government censor has the right to "cut" a broadcast speech when once started has been the subject of a legal action which has lasted three years and is expected to be settled this week. On October 8th, 1930, Mr. Zwert Brock, Secretary of the Dutch Radio Association V.A.R.A., had his speech terminated after he had uttered a few words because it had not been submitted to the Wireless Censorship Commission.

### High Hams

OUR congratulations to our contributor, Mr. H. L. O'Heffernan, on securing first place among British competitors in the Fifth International Relay Competition results.

The world's highest score for participants outside the U.S. and Canada was that of the Spanish EAR185, who secured 18,382 points in establishing world contacts. Mr. O'Heffernan, who topped the British list for the fifth year in succession, gained 10,860 points.

Says "Q.S.T.": "It was the biggest, grandest and the hardest-fought battle ever staged by the A.R.R.L."

### Radio Newspaper

A "COMPLETE radio newspaper" is to be broadcast every evening in Oporto. The journal, which will be broadcast by a leading Lisbon newspaper, will include a leading article, feature stories, a serial, magazine section and advertisements.

### Paradox

FRENCH listeners are up in arms against a decision of the Post Office in the Gironde Department that war pensioners with defective hearing are not eligible for free licences. According to the French licence regulations, exemption can be claimed by those who have been maimed and mutilated in the war, but, strangely enough, deafness is not considered to come under this category, even in the case of a wireless listener!

### Valve Technique

A FILM of the key processes in the manufacture of radio receiving valves will be shown at this evening's meeting of the Radio Society of Great Britain, to be held at 6.15 p.m. at the Institution of Electrical Engineers. The lecturer, Mr. Stephen de Laszlo, B.A. (Director of the High Vacuum Valve Co. Ltd.), will deal with "Technique in Valve Manufacture," and discuss the principles underlying thermionic emission and the principle and problems of high vacuum technique in regard to radio receiving valves.

### St. Dunstan's and Wireless

THE war against war blindness goes on at St. Dunstan's, and the Eighteenth Annual Report tells how victory is being achieved. The famous establishment in Regents Park contains many departments, including that of the Electrical Engineer, which gives advice to St. Dunstaners now making their living as wireless set constructors or general electricians. It is interesting to note that the broadcast programmes come to thousands of homes of blind people on apparatus provided by St. Dunstan's.

# America's Latest

## The Broadcasting Palace in Radio City

By A. DINSDALE

**I**N the midst of the gigantic enterprise known as Radio City, New York, the National Broadcasting Company will open its new studios on November 15th next, its seventh anniversary.

The writer has just been privileged to make a tour of the new premises under the guidance of O. B. Hanson, Chief of N.B.C.'s Operations Division, who designed the new studios. While the studios were in most cases structurally complete, they were unfinished, much scaffolding was in evidence, and many men were at work.

The central tower, at the base of which the studios are situated, is seventy storeys or 836ft., in height. Because of the large unsupported spans necessary in the construction of large, unobstructed studios, it was obviously impossible to build the studios within the tower itself, which requires a large number of closely spaced, heavy steel columns to support it. Hence, only the N.B.C. offices are within the tower structure proper; the studios are built within a twelve-storey extension.

In all, there are thirty-five studios in Radio City, covering some 400,000 square feet of space. Sixteen of these studios will be completely equipped and in operation on the formal opening night. Eleven more, including five audition studios, will be complete except for technical equipment. The remaining eight, occupying the sixth and seventh floors, will be left

hear the programme through loud speakers. Private observation booths are provided on these floors for the use of programme sponsors and their guests.

On the ninth floor is the largest studio of all. In fact, it is claimed to be the largest broadcasting studio in the world. It measures 78ft. by 132ft., and is three storeys (35ft.) high.

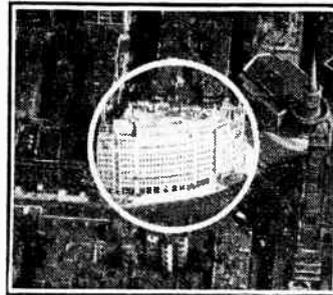
On the tenth floor are four studios arranged clover-leaf fashion around a single central control room. The floor of this control room is a large turntable, upon which the television camera of the future will be mounted, so that it can be focused into only one of the four studios through the sound-proof glass windows. In the meantime this group can also be utilised for the production of dramatic sketches without television, where it is desirable to place an orchestra in one studio, principal actors in a second, crowd noises in a third, and sound effects in a fourth. Up to the present, only one studio has been used for dramatic productions in America, everything being crowded into one room.

All studios have been constructed with an eye to the future possibilities of television. There are no lighting fixtures; all lights are sunk flush with the ceiling, the covering lenses being so arranged that every part of the studio is evenly lighted. There are no shadows anywhere. The possibility of having to use scenery has also been taken into consideration, and in the case of the largest studio two duplicate control rooms are provided, one on the studio floor level and another on the level of the floor above, so that the control-room staff may have a clear view of every part of the studio, even if scenery is being employed.

One of the most important considerations in the design of modern broadcasting studios is that of sound-proofing. European studio designers have largely eschewed steel framework in the construc-

tion of studio buildings, because steel frames have a tendency to conduct sound and mechanical vibration from one studio to another. In America, prevailing architectural practice and other considerations force steel construction on studio designers. In these circumstances, it is necessary to "float" each studio free of the main frame of the building. This is accomplished by building each studio like a box and insulating the box from the building at all contact points. For this purpose 250 tons of rock wool were used in the Radio City studios.

The studio walls consist of a layer of four inches of rock wool



**RADIO CITY**, with the new broadcasting studios in the circle. Administration and other sections of this great entertainment centre occupy the remainder of the building. (Inset) Broadcasting House, London, on approximately the same scale.



**THE WORLD'S LARGEST STUDIO?** Here is a portion of the huge "Auditorium Studio" in Radio City nearing completion. It measures 132 x 78ft. and is three storeys in height. The studio can accommodate 1,000 visitors and a 100-piece orchestra.

entirely unfinished for the time being, but will be available for future development.

The fourth, seventh, and ninth floors are studio floors, while the fifth, eighth, and tenth floors are observation floors for visitors, who can see down into the studios through large sound-proof windows and

faced with "transite," a compressed asbestos material perforated all over with small holes. This is not a very practical wall surface, for it cannot be left bare, it cannot very well be painted, nor can it be covered with wall-paper, which would cover up the perforations and present a rather hard, reflecting surface. The problem is being solved by gluing a specially woven fabric over all studio walls and ceilings. The fabric does not interfere with the acoustical treatment, and permits "breathing" through the fabric and transite. Different coloured fabrics are used in different studios.

**America's Latest—**

In some of the studios heavy drapes, suspended on rails, are provided to vary the acoustics to suit different circumstances. In others, great panels can be slid back in the walls to reveal hard reflecting surfaces. These panels are motor-driven, and controlled by switches in the studio control room. It is interesting to note that these hard surfaces are not flat, but divided up into narrow inclined sections which fit together in obtuse V angles. This is done to obtain an even dispersal of all sound frequencies, thus avoiding distressing peaks at resonant frequencies.

As is the common practice in American broadcasting, each studio has its own control room, the output of which goes to a centrally located master control room on the sixth floor, whence it is routed over wires to the local transmitters and to the rest of the nation-wide networks. Like the studios, the master control room is visible to the public through glass windows.

Also on the sixth floor, in addition to master control, are the main equipment room, the power room, the battery room, technical laboratory, operating and maintenance shops, telegraph and traffic rooms for communication with network stations, and the switching booths, which look like an automatic telephone exchange and contain 400 panels.

**Delayed Speech Effects**

A special control room has been installed for use in so-called "special events" programmes, where various parts of the broadcast may come from planes, foreign countries, ships, or pack-transmitters carried on the backs of announcers. Such complicated programmes are by no means rare in America.

Up to the present, America has not set much store by the so-called "echo chambers" developed by the B.B.C. some years ago. According to Mr. Hanson, however, Radio City is going to go one better than the B.B.C. in this respect. In addition to the mechanical control which is possible by adjustment within the echo room (adjustment of the acoustics of the room and of the distance between the loud speaker and the microphone), N.B.C. proposes at Radio City to control the period of reverberation, or echo, by means of a controllable delay circuit. In addition to this control there will be a gain control for the echo pick-up mike. Thus, the echo may be fed into the programme at any desired volume level, and with any degree of delay, or reverberation. A performance coming from a small studio could thus be made to sound as if it were coming from the vastness of an empty Olympia.

In addition to the thirty-five studios there are numerous "green-rooms" and dressing-rooms for the artists, lounges, reception rooms, musicians' rest rooms and locker rooms, storage lockers for musical instruments, sound effects, and other props, and the executive offices of the N.B.C.

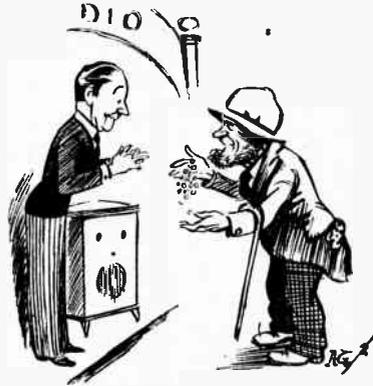
# UNBIASED

**By FREE GRID****Gold Standard**

**M**ANY and varied are the stunts employed by commercial concerns in the interests of publicity, and for the most part they are commendably cute. If ever there was a trade which should be in the van of progress in this matter, it should be the radio one, but what are we to think when leading members of it allow their publicity agents to churn out such hoary old tales as that of the man who turns up at a certain showroom or exhibition stand and pays for his purchase in golden sovereigns?

The tale, like that of Alfred and the cakes, is quite a pretty one, and, personally speaking, I swallowed it readily enough when it first appeared at the Motor Show a few years back. On that occasion, however, it at least had the merit of novelty.

I must confess, however, that the publicity merchant who has just trotted it out again has been distinctly original in using the farmer as the central figure in the story. If he really thinks that a farmer is such a fool as to pay over thirty pounds



A pretty tale.

for a twenty-guinea article, then it is high time that he spent a week on a farm. It is obvious, I think, that in rehashing this threadbare publicity stunt, he had forgotten that we had departed from the gold standard since the tale was last employed. Better luck next time.

**The Voice that Soothes**

**I** AM considerably astonished at the practically unanimous verdict which has been given by women against the lady announcer who still delights the hearts of male listeners. At least it is my experience that the verdict is an adverse one, all the females numbered among my acquaintance seeming to dislike the innovation wholeheartedly.

It is totally incomprehensible to me, for I should have thought that the appearance of a woman in a position hitherto sacrosanct to men would have been hailed with

delight by her fellow-women. I have been so impressed by the hostility shown by the womenfolk of my own home circle that I am wondering if my readers have had a similar experience, and should be glad to hear from them about it so that we could compare notes.

**Comparisons are Odorous**

**I**T is said that comparisons are always odious, but that will not deter me from making them in the case of the two great provincial radio shows at Glasgow and Manchester. I think, however, that "odorous" would be a more appropriate word than "odious" in this case, since Manchester insists on holding the show in a disused market place in a noisome back street, whereas Glasgow provides a fine modern hall, which is large, commodious, of no mean architectural beauty, and situated in one of the main thoroughfares of the city. In addition, the arrangements for attending to the inner man are infinitely superior.

This having been said in favour of the Glasgow show, there is, however, nothing more to add. Manchester was far and away the better show of the two, if only for the fact that manufacturers themselves exhibited there in almost as large numbers as at Olympia instead of leaving much of it to the local agents, as seemed to be the case in the Scottish city. Apart from this, the interest shown by the immediate natives and those from neighbouring kraals is far greater in the case of the city of smoke and shawls. They are not only far keener on home construction ("Nobbut the best, lad"), but possess far greater technical knowledge.

**Cruelty to Guinea Pigs**

**I** SEE that a group of American scientists has issued a statement to the effect that it is only a question of time before wireless waves have the effect of turning human beings into half-wits. They base their startling announcement on the results of experiments carried out on certain guinea pigs whose brain tissues have been definitely damaged as the result of being kept in the studio of a certain New York station.

Personally speaking, I am of the opinion that it is not the wireless waves which have turned the guinea pigs into half-wits, but the effect of some of the programmes. Indeed, I consider it a waste of time to have conducted the experiments on the unfortunate guinea pigs, as surely the same deductions could have been made by examining the brain tissues of certain performers who, judging by their efforts at the microphone, seem to have progressed a long way beyond the half-wit stage.

# The Crystal Cell

## A New Light Modulator for Television

By ERNEST H. TRAUB

WITH all mechanical television systems there has always been the same persistent demand for more light. Among the hitherto known light sources the neon lamp is the most common. Whilst it has the undoubted advantage that it is easy to modulate, the light efficiency is inadequate for modern television receivers, where only a small fraction of the light can be used. Mercury and sodium lamps are brighter and give a more pleasant colour, but fail to follow frequencies over 50,000 cycles. The Kerr cell, on the other hand, gives quite good light, although the actual efficiency is poor. It is, moreover, difficult to modulate with ordinary output voltages, and its characteristic is not linear so that it does not produce true black and white gradation.

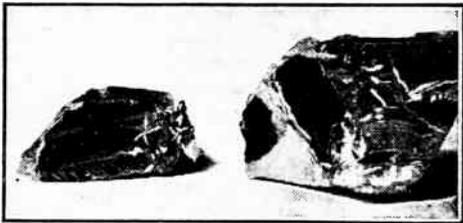


Fig. 1.—Zinc sulphide crystal in its natural form.

The ideal of the television engineer would be a light source of high efficiency, easy to modulate, giving pure white light, and having a true linear characteristic. It must, in addition, have absolutely no lag, even at frequencies running into six figures. The prospects for further research in gas discharge lamps seem rather poor, as practically all combinations of gases, using both the negative plate and the positive column, have been unproductively tried. The more hopeful path lies in the direction of a light valve, such as the Kerr cell, but without the latter's shortcomings.

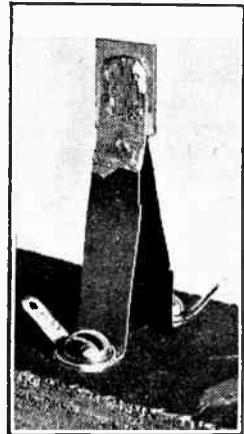
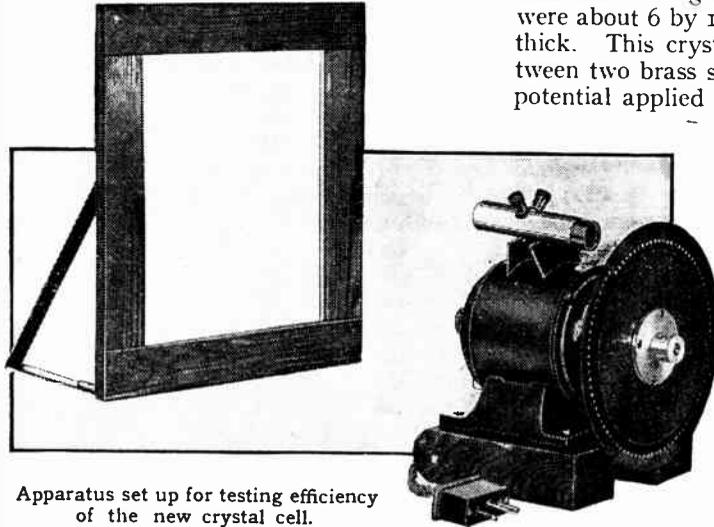


Fig. 2.—Cut and ground crystal placed between metal conductors.

Working systematically on the lines indicated above, von Okolicsanyi, a well-known Hungarian television investigator, who is best known for his Mirror Screw scanner, searched for a light valve that would, in addition to the properties outlined above, fulfil the further demands



Apparatus set up for testing efficiency of the new crystal cell.

that it should be cheap to produce, easy to handle and require no attention. This brought him to the conclusion that the substance needed should be a solid with a high Kerr constant and of great durability in order to avoid the inconvenience of liquids such as nitro-benzol. The solid must be sufficiently hard, but yet be easy to cut and polish. Lastly, the substance must be as clear as water and perfectly transparent.

### Nature of the Crystal

Okolicsanyi, therefore, continued his search among *inorganic crystals*, and tested many of these for electrical double refraction. This is known to occur to some degree in quartz, tourmalin and sodium chloride crystals. Electrical double refraction is a secondary effect in which the light is influenced indirectly by the electric field, i.e., through a dielectric. The static field directs the molecules of the crystal, according to the field strength, increasing or decreasing the angle of rotation in the polarised plane proportionately. It was found that such an effect was confined to cubic crystals, which could in turn be divided into two groups: the regular rock salt type, and the acentric group, in which the eventual solution of the problem was found, namely, the *zinc sulphide crystal* (Fig. 1).

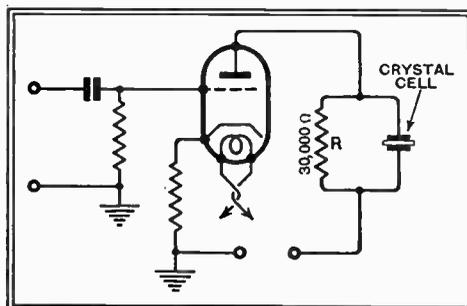


Fig. 3.—The circuit employed with the crystal cell.

For experimental purposes a small plate of crystal such as shown in Fig. 2 was cut and ground. The dimensions were about 6 by 10 millimetres and 1 mm. thick. This crystal plate was placed between two brass springs and the electrical potential applied to the two terminals, as shown.

The crystal was then placed between two crossed Nicol prisms, and set up in a television receiver. To the great joy of the inventor a perfectly good bright image appeared, which seemed to him to fulfil the demands of an ideal light valve.

For commercial use the whole light valve is set up in a metal tube about 4 inches long, which contains the crystal, the Nicol prisms and two concentrating lenses. To prove the absolute superiority of the crystal cell, a receiver was constructed using a go hole Nipkow disc, which is optically the least efficient of all scanners. The disc is of 10 inches diameter, the holes being only one-tenth of a millimetre square. Using only a small 30 watt lamp as the light source an image was projected

on to a ground-glass screen, as shown in the photograph, the size being about one foot square.

Advantages claimed for the crystal cell over the ordinary nitro-benzol Kerr cell are:—

(1) Solid, therefore no evaporation or smell as in the case of nitro-benzol.

(2) Smaller, thus allowing the whole electro-optical system to be built into a single unit.

(3) Better light efficiency due to closer spacing of Nicols and crystal. Efficiency about 35 per cent. compared with 10 per cent.

(4) Infinite durability.

(5) Linear characteristic.

(6) *Smaller capacity*, requiring as a result only one-tenth of the power needed with the nitro-benzol cell. As the cell can be placed directly in the anode circuit of the output valve a resistance of only 30,000 ohms is required (Fig. 3). The potential is about 400 volts, so that



Fig. 4.—The crystal mounted between Nicol prisms. The two terminals are for the applied potential across the crystal.

**The Crystal Cell.—**

the power needed can be calculated at about 5 watts. This figure can be obtained with any powerful mains receiver.

The circuit arrangement employed is shown in Fig. 3. Okolicsanyi has therefore succeeded in finding a light valve that is suitable for any mechanical television receiver where a concentrated source of modulated light is required. This light source is more efficient in all respects than any other one previously known.

It is, moreover, absolutely without lag. It is stated that measurements have been made, when it was found that the frequency curve shows no sign of falling off even at 350,000 cycles!

Even though the new cell is ideal for home television receivers from a technical point of view, the price is a further important factor in its favour. The price of the complete electro-optical unit, as shown in Fig. 4, is stated by the inventor to be under £5.

**BEHIND THE SCENES****"Down-Hearted" Delegates at Amsterdam**

By Our Special Representative

**D**ELEGATES representing the broadcasting organisations of twenty-four European countries were present at the International Broadcasting Union's meeting at Amsterdam which was held from October 4th to the 12th. In addition, a number of countries sent Government representatives, drawn from the postal administrations, to act as "observers," some of these coming from as far afield as Algeria and Turkey.

Strict secrecy was observed until an official communiqué was issued on Thursday, October 12th. The main aim of the Amsterdam Conference, according to the communiqué, had been to devise ways and means of putting the Lucerne Plan into practice with the least possible disturbance to listeners. This difficult task was not made easier by the fact that certain Governments had still refrained from signing the Convention. However, according to the communiqué, the difficulties are confined to the long waveband, and even here the hope was held out that a *modus vivendi* could be arrived at by reason of the fact that certain of the stations scheduled in the Lucerne Plan would not be operating on January 15th, when the Plan comes into effect.

According to the communiqué certain technical decisions have been arrived at which are being communicated to the Governments, and investigations have been made to see whether the wavelength problem can be settled on a technical basis. For instance, the Union is considering the use of anti-fading aerials and the synchronisation of transmitters.

I am able to state that the Amsterdam Conference decided only after long discussion *not* to alter the Lucerne Plan, a decision which was rejected point blank by the Russian delegates, who declared that the whole of that country's wave distribution had been rearranged and could not, therefore, comply with the Lucerne Plan.

Holland, one of the eight non-signatories to the Plan, has consulted international law experts on the question of the retention of its long wavelength. It is considered that the International Court at the Hague will probably agree to arbitrate on whether Holland should be required to sacrifice this wave in accordance with the Lucerne Plan.

All that was effected at Amsterdam, it would appear, was an agreement among the technical experts regarding certain modifications in the Lucerne distribution of the long waves, the new aim being to take advantage of the fact that not all the claimants will be working when the scheme comes into operation. *What will happen when they are all ready to transmit is not explained.*

Despite Government modifications, it appears that the medium waves will be "all right," an opinion which can only be confirmed, or otherwise, at midnight on January 15th, 1934.

The delegates at Amsterdam appeared to be downhearted, and the conviction grew that the meeting, to no small extent, had been a waste of time and money, even if the medium waves are "all right." For the question of Luxembourg was left untouched, and Luxembourg, with its 200 kilowatts, may easily wreck whatever frail arrangement is arrived at for the distribution of the long waves!

**DISTANT RECEPTION NOTES****Wavelength Wanderings of Small Stations**

**A** CORRESPONDENT who writes from Stourbridge tells me that he suffers from a considerable amount of morse interference when listening to the Midland National on 1554.4 metres. He asks whether I can tell him where it comes from. I am afraid that I cannot, for I have not noticed any such interference for a very long time in my own locality. Possibly some other reader may be able to supply the information.

It occurs to me that the interference may possibly be a harmonic of a commercial station working on about 3,100 metres. These harmonics can be troublesome at times, and often they are much worse in some localities than in others.

A week or two ago I mentioned that the station interfering with Huizen was a Roumanian. I have since learnt that it is Brasov, which, under the Lucerne plan, will have the exclusive use of the 1,875-metre wavelength. Apparently it is putting in a little practice beforehand! When the Plan comes into force, Huizen is allotted a wavelength of 1,345 metres to be shared with the Russian station Kharkov.

Readers should note, by the way, that Huizen and Hilversum have now made their quarterly exchange once more, so that Huizen is genuinely Huizen on 1,875 metres, and Hilversum genuinely Hilversum on 296.1 metres.

**Medium Waveband Jumble**

An instance of what even one small station can do in the way of causing interference is to be found nowadays on the band of wavelengths that lies between Rome's 441 metres and Beromünster's 459 metres. This small patch contains nominally two common-wave channels on 453.2 and 447.1 metres respectively. Recently Radio Agen has taken to working a fraction of a kilocycle above its normal frequency. In an attempt at self-defence, several of the numerous stations using the 453.2-metre channel have made slight wavelength changes, and this has caused similar changes to be made in the other common-wave channel. The net result is one of the most priceless jumbles that has ever been heard on the medium waveband.

Atmospherics were very bad for some little time whilst the weather was making up its mind about breaking after the long dry spell. Once the rain came there was a big improvement. I have no doubt, too, that the rain will have another beneficial effect in many instances. Not a few listeners bury their earth connections in chalky or gravelly soil instead of going down the extra few inches required to reach the heavier sub-soil. These have doubtless

found a considerable increase in all-round signal strength recently owing to the moistening of the soil.

The 60-kilowatt Mühlacker station does not yet seem to have closed down, for the programmes are still strongly received. Is it a case of business as usual during alterations?

On the long waves, Radio-Paris, Warsaw, Luxembourg, and Oslo are the best stations at the moment. Huizen is excellent on nights when Brasov is silent, but Kalundborg is seldom free from the unwelcome accompaniment of Monte Ceneri. Zeesen varies greatly from day to day.

Excellent reception of a large number of stations is now possible on the medium waveband, though there are many which are affected by occasional heterodynes due to wavelength wandering on the part of small stations. The best of the stations on this band are Budapest, Florence, Prague, Langenberg, Beromünster, Rome, Katowice, Toulouse, Midi, Leipzig, Strasbourg, Poste Parisien, Hilversum, Heilsberg, and Nürnberg. **D. EXER.**

**FOREIGN BROADCAST GUIDE****FECAMP**

(FRANCE).

Geographical position: 49° 45' N.; 0° 23' E.  
Approximate airline from London: 114 miles.

Wavelength: 225.9 m. Frequency: 1,328 kcs.  
Power: 10 kw.

Standard time: Greenwich Mean Time.

**Standard Daily Transmissions.**

*Week Days:* English concerts, 11.00; 11.30; 16.30.  
Children's Corner: 17.30; 22.30. French concerts: 12.00; 12.45; 18.00; 20.30. English News Bulletin: 00.05. Latest French News: 01.00. Dance Music: 01.15.

*Sundays:* Continuous sponsored programmes for British listeners and French wireless entertainments from 11.00 until 01.30.

Announcers: Man and woman.  
Call: *Ici Radio Normandie* (also in English at certain periods of the day and night).

Opening Signal: For French broadcasts: (song) *Nos Vieux Pommiers* (gramophone record); for English transmissions: a fanfare of trumpets.

Interval Signal: Bell (irregular).

Time Signal: Carillon and chimes from the old Benedictine Monastery at Fécamp.

Closes down as other French stations with good-night greetings followed by popular local song: *Ma Normandie*. At the end of the English broadcasts the I.B.C. good-night melody is played.

## The Wireless World

FOREIGN PROGRAMME  
SUPPLEMENT

## ATHLONE

25 kc/s, 413 metres; 60 kW. Relayed by York, 1,337 kc/s, 224.4 metres.—8.30 p.m., Time Signal. 8.31, Concert of Opera Music by the Station Orchestra. Soloists: Leslie Jones (Baritone) and Ben Williams (Tenor). 9.30, The Adventures of Ellis Palmer. 10.15, Irish Music by the Station Orchestra. 10.25, Gaelic Song Recital. 10.35, Uilleann Pipe solos by A. J. Keane. 10.45, Irish Music by the Station Orchestra. 11.0, Time Signal, News, Weather Report and Close Down.

## BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—11.0 a.m., Chimes and Weather. 1.0 p.m., Gramophone Music. In the interval at 1.30, Theatre Notes. 2.0, Sextet Concert. 3.0, Programme for Hospitals and other Benevolent institutions, with Gramophone Records. 4.0 to 5.30, Interval. 5.30, Agricultural Talk in Catalan, followed by Gramophone Music. 6.0, Concert by the Station Orchestra. 6.30, Song Recital by Eusebi Carasusan. 7.0, Concert by the Station Orchestra and Concepció Allua (Songs). 8.0, Dance Music, relayed from the Hollywood Bar. 9.0, Extracts from Musical Comedies on Gramophone Records. 0.45, Chess Lesson. 11.0 (approx), Close Down.

## BARI

112 kc/s, 269.8 metres; 20 kW.—9.0 to 9.45 a.m., See Rome. 9.45, Bible Reading. 10.0 to 11.0, See Turin. 11.30 See Rome. 11.45, See Turin. 12 Noon to 1.0 p.m., Programme to be announced. 1.0 till Close Down, See Rome.

ASLE.—See Schweizerischer Landessender.

## BERLIN

DEUTSCHLANDSENDER (REICHSENER), 183.5 kc/s, 1,635 metres; 60 kW.—15 a.m., Gymnastics from Berlin (Funkstunde). 5.30, Today's Motto. 5.35, Programme from Hamburg. 7.15, Agricultural Programme. 7.55, Service and Chimes from Berlin (Funkstunde). 9.5, Weather from Berlin (Funkstunde). 10.0, Reading of Poems. 0.30, See Leipzig. 11.0 Orchestral Concert conducted by Thieme. 11.55, Time Signal. 12 (Noon), Gramophone Concert of Ballet Music and Waltzes. 1.0 p.m., Der Bauernführer (The Peasant's Leader)—Radio play for Young People. 2.0, Songs by Children. 2.20, Programme for Women. 2.45, Reading. 3.0, Gramophone Concert of Classical Music. 3.30, See Munich. 4.0, See Langenberg. 4.45, Concert of Light Music on Gramophone Records. 5.40, Talk: The Germanic Epic Song. 6.0, Rural Programme. 7.0, Gustav Frenssen reads from his own works, on his Seventieth Birthday. 6.50, Sports Notes. 7.0, Orchestral Concert conducted by Hans Hörner, relayed from the Laich Saal; Symphony in A (Mozart); Pianoconcerto in C Minor (Beethoven); Vierzehn, Der Freischütz (Weber). 8.0, Chirans im Bootshaus—A Farewell to Water Sports. 9.0, News. 9.45, Weather. 1.0, See Munich.

## BERLIN

UNKSTUNDE.—715 kc/s, 419.5 metres; 1.5 W.—10.30 a.m., See Leipzig. 11.0, See Hamburg. 1.0 to 1.30 p.m., Interval. 1.30, Programme for Young People. 2.15, Talk: Berlin Curiousities. 2.30, Orchestral Concert, conducted by Alfred Engel. 3.5 to 5.35, Radio Report from Potsdam of the second Half of the International Football Match Brandenburg v. North Italy. 3.35, concert (contd.). 5.0, A Programme for Old People—Songs, Talk and Pianoforte Music. 6.0, A Family at the Microphone. 6.30, Report of a Visit to a Berlin amputee. 6.50, Sports Notes. 7.0, Lottery announcements. 7.5, Max and Moritz—Ursache Oratorio in Six Parts after Wilhelm Busch (Georg Schuler). The Berlin Wireless Orchestra and Choir, conducted by

## SUNDAY

OCTOBER THE TWENTY-SECOND

the Composer. 8.0, Concert by the Wireless Orchestra, conducted by Waldemar von Vuitée. 9.0, News. 9.15 (approx.), Dance Music from the Eden Pavilion. In the interval, from 10.0 to 10.10, Topical Talk. 12 Midnight, Close Down.

BERNE.—See Schweizerischer Landessender. BERMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—11.15 a.m., Concert by the Bratislava Sokol Band. 12.30 p.m., See Prague. 1.0, Agricultural Talk. 1.15, See Prague. 1.25 to 1.30, Hydrographic Report. 3.0, Orchestral Concert from Kosice, 1,022 kc/s, 293 metres. 4.30, Relay from Brezno. 6.0, See Prague. 6.20, See Moravsko-Ostrava. 6.50, Madame de la Vallière—Operetta in Four Acts (Mory), by the Zora Vocal Union and the Station Orchestra. 9.20, See Prague. 10.10 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—11.0 a.m. (from Gleiwitz), Programme by the Upper Silesian Hitler Jugend. 12 Noon, Concert from Heilsberg. 1.0 p.m., Talk: The Vegetable Market. 1.20, Talk on Photography. 1.35, Talk on Meteorology. 2.0, Recital of Bandion Duets. 2.30, Programme for Children. 3.0, Dance Music and Light Music, from Bad Altheide. In the interval from 3.50 to 4.10, Radio Report of the Unveiling of the Andreas-Baude at Waldenburg. 5.0, Tales. 5.20, Radio Report, from Duisberg, of the Second Half of the International Football Match—Germany v. Belgium. 5.50, Talk: Winter Coats. 6.0, Gipsy Music and Poetry—Talk with Gramophone Illustrations. 6.50, Talk: Productions of German Plays at the Lobethaler. 7.0, Radio Parade—Variety Programme, relayed from the Konzerthaus. In the interval from 8.0 to 8.10, News. 9.0, Time and News. 9.30, Dance Music from the Konzerthaus. 12 Midnight, Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—5.0 p.m., German Transmission; Concert by a Salon Trio. 6.0, See Prague. 6.20, See Moravsko-Ostrava. 6.50, See Bratislava. 9.20, See Prague. 10.10 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—10.0 a.m., Gramophone Concert of Music by Lalo. 11.0, Concert by the Small Station Orchestra, conducted by Leemans. 12 Noon, Concert, relayed from the Grand Hotel, Antwerp. Conductor: André Fellemann. 1.0 p.m., Le Journal Parlé. 1.10, Programme by Mickey's Club Jazz Attraction. 1.30, Songs by Mme. Bolotine. Aria from Sanson and Delilah (Saint-Saëns); Les hercaux (Fauré); Old Spanish Song (Aubert). 1.40, Programme by Mickey's Club Jazz Attraction (contd.). 5.0, Concert by the Radio Orchestra, conducted by Franz André. 5.30, Football Results. 6.0, Pianoforte Recital by Mile. Gabrielle Tambuysen. 6.30, Music by the Berlin Philharmonic Orchestra (on Gramophone Records). 7.15, Religious Address. 7.30, Music

Talk. 8.0, Olivier le simple—Opera (Vreuls). In the interval at 8.45, Recitation of Poems. 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—10.0 a.m., Concert by the Small Station Orchestra. 11.0, Gramophone Music. 12 Noon, Programme by Mickey's Club Jazz Attraction. 12.30 p.m., Song Recital by Mme. Bolotine. 1.0, Le Journal Parlé. 1.10, Concert, relayed from the Grand Hotel, Antwerp. Conductor: André Fellemann. 5.0, Concert, relayed from the Century Hotel, Antwerp. 5.30 (approx.), Sports Notes. 6.0, Gramophone Concert. 6.30, Concert by the Small Station Orchestra. 7.15, Religious Address. 7.30, Le Journal Parlé. 7.55, Music Talk. 8.0, Programme by the Radio Orchestra, conducted by Franz André. Soloist: Boyarino (Songs and Balalaika Music). 8.45, Recitations. 9.0, Concert by the Radio Orchestra, conducted by Franz André. Soloist: Clément Doucet (Pianoforte). Russian and Romanian Dances (Bareh); Finale from the Violin Concerto (Mendelssohn); Pianoforte Solos, Foxtrot (Pollack); Waltz, Wienerblut (Strauss); African Suite (Coleridge-Taylor); Viennese Pieces (Kreisler). 10.0, Le Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert of Light Music by the Jean Mateo Orchestra. In an interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Gramophone Music. 6.40, Talk. 7.0, Concert by the Station Orchestra. Soloist: Aida Ibeta (Songs); Arias from (a) Aida (Verdi), (b) Tannhäuser (Wagner), (c) Fidelio (Beethoven); Overture, Banditenstreich (Suppé); Dance Suite from The Bartered Bride (Smetana); Selection from Die Faschingsfee (Kálmán); Hellmesbergeriana (Ischpold); Potpourri of Popular Romanian Songs (Bartók); Hora Si arcanu (Brodiceanu). In an interval at 8.0, Talk. 8.45, Radio Journal.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 5.45 p.m. till Close Down.—8.15 a.m., News. 9.0, Divine Service from the Reformed Church. 10.0, Catholic Service Relay, followed by Orchestral Concert, conducted by Ludwig Rajter. Soloist: Ilonka Feher (Violin). 1.0 p.m., Gramophone Concert. 2.45, Dulvimer Recital by Andreas Krudy. In the interval, Agricultural Talk. 3.30, Talk. 4.0, Military Band Concert, conducted by Friesay. 5.15, Lecture Recital: Liszt. 5.45, Hungarian Folk Song Recital by Lenke Zsögon and Béla Venczel, accompanied by the Alexander Bura Gipsy Band. 7.15, Two One-Act Plays (Zilahy). 8.0, News. 8.15, Pianoforte Recital by Emanuel Hegyi. 9.0, Humorous Programme. 9.30, Concert by the Rezső Horvath Gipsy Band, relayed from the Café Emke. Soloist: Imro László (Songs).

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—7.0 a.m., Gymnastics for Women. 7.15, Gymnastics. 8.0 to 8.30, Talk. 9.0, Divine Service relayed from the Cathedral. 10.30, Weather and News. 11.0, Time and Chimes from the Town Hall. 11.5, Concert by the

Radio Orchestra, conducted by Launy Gröndahl: Overture, Yelva (Reissiger); Two Siamese Folk Songs; Southern Rhapsody, Virginia (Wood); Death and the Maiden (Schubert); Overture, Romeo and Juliet (Svendson). 12 Noon, Talk in English: The City Guilds. 12.20 p.m., Talk in German: Pre-War German Lyrics. 12.40, Talk in French. 1.0, Gramophone Music. 1.30, Accordion Solos. 1.55, Programme for Children. 2.25, The Gipsy Baron—Operetta in Three Acts (Joh. Strauss) (concert version) relayed from the State Broadcasting Building. 4.0 (also relayed by Skamlebaek on 31.51 metres) Divine Service relayed from Holmens Kirke. 5.20, Talk: Moorish Art. 5.50, Weather, News and Sports Results. 6.15, Time Signal. 6.30, Talk. 7.0, Chimes from the Town Hall. 7.5, Danish Marches and Waltzes by a Military Band. 7.25, Military Band Concert of Music by General de Meza, with Introductory Talk. 8.15, Gramophone Music. 8.30, The Hansen Family—Sketch (Jens Locher). 8.45, Dance Marches and Waltzes (contd.). 9.5, News. 9.15, Reading (Theodor Storm). 9.25, Concert: Coronation March from The Prophet (Meyerbeer); Jubel-Ouverture (Weber); Selection from Lohengrin (Wagner); Melody (Lincke). 10.0, Dance Music relayed from the Ritz Restaurant. In the interval at 11.0, Time and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12.30 p.m., Programme in English by the I.B.C. 11.0 a.m., Happy Hour. Part 1: Orchestral Concert. Signature Tune; March, La Zarine (Ganne); Animal Antics (Wark); Selection from The Chocolate Soldier (O. Straus) (Choral); Somewhere a Voice is calling (Tate); Who ate our Nelly; Waltz, Dreams on the Ocean (Gungl); Amina (Lincke); Love and Life in Vienna (Penard); Part II. Organ Recital: American Patrol (Mecham); The Organ Grinder (Stept); Valse Pondrée (Popy); Song: Bless this House (Taylor); Verschmähte Liebe (Lincke); A Cuckoo in the Nest (Sievier); Reminiscences of Gilbert and Sullivan; Signature Tune. 12 Noon, Variety Concert: There's a good time coming; That's a good girl (Gershwin); Moonlight and Roses (Moré); The Chicken Reel; Please, Mr. Hemingway (Silver); Selection from Queen High; Help yourself to happiness; El Relicario (Padilla); Give me a Kiss Sylvia (Scollard); Lighthouse Blues; Funny Face; S'Wonderful. 12.30, Programme in French. 2.30 to 7.30, Programme in English by the I.B.C. 2.30, Orchestral Concert: Southern Rhapsody (Hosmer); In Tulip Time beside the Water Mill (Ailbott); The Fortune Teller (Herbert); Song: My Mother's Garden (Hanley); Selection from Give me a ring (Bronnos); Liebes ständchen (von Blon); Stephanie Gavotte (Czibulka); Selection from Sari (Kálmán). 3.0, Light Music: Fairy Tale (Heykens); The Way to the Heart (Lincke); The Clatter of the Clogs (Flynn); Song: Throw open wide your window (Cáson); Heartaches (Klener); Velela Medley (Varney); Pianoforte Solo: Let love take care of you (van Phillips); Gridiron Club March (Souza). 3.30, Concert: Coronation March from The Prophet (Meyerbeer); Hearts and Flowers (Czibulka); Song: The Blue Danube (Strauss); Glow-worm Idyll (Lincke); Selection from Madame Butterfly (Puccini); Song: Frühlingsstimmen (Strauss); Grand March from Aida (Verdi); Schubertiana (arr. Finck). 4.0, Judge Rutherford's Address. 4.15, The I.B.C. Nursery Corner. 5.0, Concert of Gramophone Records: The Match Parade (Webbe); The Grass is getting Greener all the time (Burke); Sam's Medal

OCT. 22nd **SUNDAY** continued

(Hogan); Flor de Cuba (Conyers); I had to go and find another job (Scott); Roll up the Carpet (Klages); Old Spotted Cow (Stanley); Selection from Music in the Air. 5.30, I.B.C. Members' Request Hour: Colonel Bogey (Alford); Largo (Nelson and Ager); Wiedersehen, my dear (Nelson and Ager); The Jolly Sailor (Carter); I hear you calling me (Marshall); Her name is Mary (Sievier); The Old Rustic bridge by the Mill (arr. Mill); Old Comrades (Teike). 6.0, The Rationalist Press Broadcast: March from Tannhäuser (Wagner); Speech by Lord Snell of Plumstead C.B.E. (formerly Under-Secretary for India) on the Work and Aims of the Rationalist Press Association; Selection from I Paggiacci (Leoncavallo). 6.15, Accordion Band: Yip-I-addy-I-ay (Flynn); Accordion Solo: Annette (Phillips); After the Ball (Harris); Accordion Nights. 6.30, Socapools' Concert of Dance Music by Joe Moss' Band from the Kit Kat Restaurant (Electrical Transcriptions): Isn't it Heavenly (Hamburg); Mary Rose (Parr-Davies); Sentimental Gentleman from Georgia (Arden); Under a blanket of Blue (Symes); Reflections in the Water (Loeb); Happy Ending (Parr-Davies). 7.0, Military Music: Pop and Circumstance (Elgar); Wood Nymphs (Coates); Nibelungen March (Wagner); Cradle Song (Brahms); Selection from The Pirates of Penzance (Sullivan); Variation and Dance Circassienne from La Source (Delibes); Valse trieste (Sibelius); Classical Memories (arr. Erwin). 9.0 to 2.0 a.m. (Monday), Programme in English by the I.B.C. 9.0, Concert of Dance Music: Signature Tune, Happy Feet; Lazybones (Carmichael); Under a blanket of Blue (Symes); Seven years with the wrong woman (Miller); Love is the thing (Washington); I wish I had Wings (Woods); Mademoiselle (Nesbitt); Let's call it a Day (Brown); Sweet Dreams, Pretty Lady (Hanley); Signature Tune, Happy Feet. 9.30, Talkie Time; Tunes from the Talkies; Signature Tune, Sittin' in the Dark; 'Twixt the Devil and the Deep Blue Sea (Eyton); Sweetheart Darlin' (Stophart); Talking to you about me (Snyder); Mrs. Bartholomew (Ellis); Pianoforte Solo: Selection from Forty-Second Street (Dubin); There's Magic in the Air (Eyton); In the Park in Paris (Woods); Smilin' Through (Penn); Signature Tune. 10.0, Octet Concert; Mignon Gavotte (Thomas); Les Millions d'Arlequin (Drigo); Song: The Pipes of Pan (Monckton); Chant sans Paroles (Tchaikovsky); Minuet in G (Beethoven); Song: When the House is asleep (Padgett); Hungarian Dance in D Major (Brahms); Ballet Music from Rosamunde (Schubert). 10.30, Concert of Dance Music: Don't blame me (Fields); Egypt (Wallace); It's not a Secret any more (Blue); I always keep my girl out late (Abraham); Aloha Oe! (Liliuokalani); Look what you've done (Rudy); Learn to Croon (Coslow); There's a Cabin in the Pines (Hill); I'll take an option on you (Rainey). 11.0, Concert: Signature Tune, Happy Days are here again; Hold your man; Happy as the day is long (Koehler); I've found the right girl (Lupino); You're an old Smoothie (Whiting); Flor de Cuba (Conyers); Sing another line (Carson); Blue Cloud (Ewing); Hold your man (Freed); Signature Tune, Happy days are here again. 11.30, Concert by the I.B.C. (Ireland), Ltd.: Signature Tune, Come back to Erin; Selection from He Wanted Adventure (Waller); Song of the Tramp (Sievier); A Good Old Irish Stew; Rosa Mia (Guizur); Selection from The Charm School (Moretti); Song: The Lass from County Mayo (Browne); Viola Solo: Oh could I but express in Song; Selection from The Quaker Girl (Monckton); Signature Tune, Come back to Erin. 12.5 a.m. (Monday), The I.B.C. Late News Bulletin. 12.10 (approx.), Club Concert for Devizes Listeners: Signature Tune, The Chum Song; When my little Pomcranian (Little); Isn't this a night for love (Burton); I'll show you off (Abraham); Then the moon came out (Miller); My Wishing Song (Burke); Adorable (Whiting); Two Buck Tim from Timbuctoo (Goodhart); Let's call it a day (Brown); P.C. 132 (Munroe); Tick Tock (Vienna); Honeysuckle Rose (Waller); Avalon (Rose); At the Old Pig and Whistle (Butler); Signature Tune. 1.0, Orchestral Concert: Signature Tune, Bells of Normandy; Chewing Gum (Kassel); I cover the Waterfront (Heymann); Twelfth Street Rag (Huday); Thank Heaven for you (Robin); I raise my hat (Franz); Down the Old Ox Road (Coslow); Lover (Rodgers); Hold me (Schuster); Somebody stole my gal (Wood); Sweep (Ellis); This lovely Rose (Sievier); You don't understand (Furbur); Heebie Jeebies (Venuti); Stay out of my dreams (Washington); My! oh My! (Revel); One Tiny Tear (Connely); Signature Tune. 2.0 a.m., I.B.C. Good-night Melody and Close Down.

**FLENSBURG.**—See Hamburg.

**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—10.30 a.m., See Leipzig. 11.0 to 12.15 p.m., See Stuttgart. 12.15, Gramophone Concert of Light Music. 12.45, Talks arranged by the Wiesbaden Board of Agriculture. 1.30, Programme for Children. 2.15, Relay of the Celebrations for the Final Day of the National Handicraft Week from St. Paul's Church. 3.0, Concert by the Station Or-

chestra, conducted by Dr. Reinhold Merten: Soloists: Signund Bleier (Violin) and Minnie Lensch (Soprano). In the interval from 4.0 to 4.45, See Langenberg. 5.0, Radio Report from the Autumn Market Fair at Friedberg. 5.25, Humorous Interlude (arr. Freyberg). 5.50, Programme to be announced. 6.20, Sports Notes. 6.30, Talk: The Grand Duke's Library in Darmstadt. 7.0 to 9.0, See Langenberg. 9.0, Time and News. 9.20, See Stuttgart. 9.30, Local News. 9.45, See Stuttgart. 11.0, Serenade on Gramophone Records. 1.0 a.m. (Monday), Close Down.

**FREDRIKSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—10.30 a.m., See Leipzig. 11.0, Concert by the Small Station Orchestra, conducted by Adolf Secker. In the interval at 11.55, Time and Weather. 1.0 p.m. (from Kiel), Programme for Children. 1.50, Weber Concert of Chamber Music. 2.35, Wind Instrument Concert. 3.35, Thé Dansant. In the interval, Short Sketch. 5.0, De Aukshon—Dialect Comedy in One Act (August Hinrichs). 5.45, Concert of Folk Music. 6.35, Sports Notes and Weather. 7.0, Classical Concert of Viennese Music by the Philharmonic Orchestra, conducted by Richard Richter, relayed from the Musikhalle. Soloists: Ilse Grunewald (Soprano) and Bernhard Hamann (Violin). Overture, The Magic Flute (Mozart); Violin Concerto in D (Mozart); Two Pieces (Schubert): (a) Moment musical, (b) Ave Maria; Ah perfido—Concert Aria for Soprano and Orchestra (Beethoven); The Eighth Symphony (Beethoven). News in the interval. 9.0, Second News. 9.20, Review of the Political, Cultural and Artistic Events of the Past Week. 9.35, Programme from Berlin (Funkstunde). 12 Midnight (approx.), Close Down.

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—10.30 a.m., See Leipzig. 11.0, Concert by the Small Station Orchestra, conducted by Eugen Wilcken. 1.0 p.m., Talk on Chess. 1.30, Programme for Young People. 1.55, Humorous Items in East Prussian Dialect. 2.15, Talk: The Hunting Exhibition in Braunsberg. 2.20, Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner. Soloists: Ilonka von Ferenczy (Soprano) and August Hiewers (Violin). 4.0, See Langenberg. 4.45, Pianoforte Recital of Music by Great Masters. 5.15, Talk: Schooling for Young and Old. 5.30, Reading (Walter Persich). 5.50, Chamber Music of Old Königsberg—Recital, with Commentary by Müller-Bjattan 6.25, Reading (Wiecherl). 6.50, Sports Notes. 7.0, Concert by the Small Station Orchestra, conducted by Eugen Wilcken. 9.0, News. 9.15 (approx.), Dance Music from Berlin (Funkstunde). 11.0 (approx.), Close Down.

**HILVERSUM**

1,013 kc/s, 296.1 metres (7 kW up to 5.40 p.m., and 20 kW from 5.40 p.m.).—8.40 to 11.40 a.m., Programme of the Workers' Radio Society (V.A.R.A.). 8.40, Pigeon-Flying and Football Notes. 8.43, Horticultural Talk. 9.10, Organ Recital by Johan Jong. 9.40, Recitations and Gramophone Music. 10.0, Concert by the V.A.R.A. Orchestra, conducted by Ilugo de Groot. Soloist: Yvonne Fabrè (Songs). In the interval at 10.40, Recitations. 11.40 to 4.40 p.m., Programme of the General Broadcasting Company (A.V.R.O.). 11.40, Organ Recital by Pierre Palla, with Violin Solos by Boris Lensky. 12.20 Songs by the Crescendo Male Voice Choir. 12.40, Concert by Hans Schindler and his Orchestra. 1.40, Book Review. 2.10, Second Symphony (Gustav Mahler), by the Concertgebouw Orchestra, conducted by Eduard van Beinum, relayed from the Concertgebouw, Amsterdam. Soloists: To van der Shys (Soprano), and Maartje Offers (Contralto). 3.40, Gramophone Music. 4.25, News. 4.40, Programme for Children, arranged by the V.A.R.A. 5.40, Religious Programme of the Liberal Protestant Radio Society (V.P.R.O.). 7.40 till Close Down, A.V.R.O. Programme. 7.40, Time and News. 7.55, Concert by the Concertgebouw Orchestra, conducted by Eduard van Beinum, relayed from the Concertgebouw, Amsterdam. Soloists: Ethel Bartlett and Rae Robertson. Double Concerto (Bach); Double Concerto

(Mozart). 8.55, Concert by the Wireless Orchestra, conducted by Albert van Raalte. Soloist: Dusolina Giannini (Soprano). In the interval at 9.55, Gramophone Music. 10.55, Concert by Hans Schindler and his Orchestra. 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW, until 3.40 p.m. Transmitted from Kootwijk on 50 kW from 3.40 p.m.—8.10 to 9.10 a.m., Programme of the Catholic Radio Society (K.R.O.). Children's Mass from Rotterdam. 9.10 to 11.55, Programme of the Christian Radio Society (N.C.R.V.). 9.10, Sacred Music on Gramophone Records. 9.30, Divine Service from Scheveningen, followed by Sacred Music on Gramophone Records. 11.55 to 4.40 p.m., Programme of the K.R.O. 11.55, Sextet Concert. 12.40, Talk. 1.0, Concert (contd.). 1.50, Literary Talk. 2.10, Concert by the K.R.O. Orchestra, conducted by Woud. 2.40, Gramophone Music. 2.55, Talk for Women. 3.10, Gramophone Music. 3.40, Concert (contd.). 4.10, Programme for Hospitals. 4.40 to 7.25, Programme of the N.C.R.V. 4.40, Recital of Sacred Music. 5.30, Divine Service from Klundert, followed by Sacred Music on Gramophone Records. 7.25 till Close Down, Programme of the K.R.O. 7.25, Football Results. 7.30, Talk. 7.55, Concert by the K.R.O. Boys. 8.40, News. 8.45, Concert by the Station Orchestra, conducted by Gerritsen: Overture, Prometheus (Beethoven); Dances (Beethoven); Symphony No. 3 in A minor (Mendelssohn). 9.35, Gramophone Music. 9.55, News. 10.0, Concert (contd.): Selection from Le roi s'amuse (Delibes). 10.20, Choral Epilogue. 10.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 a.m., Sports Notes and Amusement Guide. 8.15, Radio Concert. In an interval at 8.45, News. 10.0, Request Half Hour. 10.30 till Close Down, Programme in English by the I.B.C. 10.30, Concert of Light Music: Selection from The Maid of the Mountains (Fraser-Simson); Stardust (Carmichael); Song: You've got me crying again (Jones); Live, Laugh and Love (Heymann); Mazurka from Coppélia (Delibes); Pianoforte Selection from Cat and the Fiddle (Kern); Saschinka (Schirmann). 11.0, Military Band Concert: Military March (Schubert); Medley of British Songs; Wood Nymphs (Coates); March, Old Comrades (Teike); Danse des Eclairpes; Scene d'amour from La Source (Delibes); The Parade of the Tin Soldiers (Jesse); Gaiety Echoes. 11.30, Orchestral Concert of Light Music: The Skaters' Waltz (Waldteufel); Play, Fiddle, Play (Lawrence); Shining Moon; Selection from The Song of Songs (Moya); Rosa Mia (Guizur); Serenade (Heykens); Waltz, Wine, Woman and Song (Strauss); The Grasshoppers' Dance (Bucalossi). 12 Midnight, Dance Music: Hold me; The lady I love; Maybe I love you too much; Harlem Fuss; I'm one of the Lads of Valencia; My Heart's To Let; The King's Navee; Moon Song; One little Word led to another; Isn't it Romantic?; Drifting down the Shalimar; Piccaninies' Heaven; Waltzing in a Dream; Butterflies in the Rain; How are you?; Standing on the Corner. 1.0 a.m. (Monday), I.B.C. Good-night Melody and Close Down.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—10.30 a.m., See Leipzig. 11.0 to 12.15 p.m., See Stuttgart. 12.15, Musical Programme. 1.30, See Frankfurt. 2.30, Chamber Music. 2.45 Talk: Parents and Children. 3.0, See Frankfurt. 4.0, Radio Report of the International Football Match, Germany v. Belgium, relayed from Duisburg. 4.45, Gramophone Records of Light Music. 5.0, Reading in Dialect. 5.20, Light Music by the Fröhliche Fünf. 5.50, Talk: Josef Pon-en and Thomas Mann. 6.0, Rondo for two Pianofortes, Op. 73 (Chopin), on Gramophone Records. 6.10, Das Abendspiel—(Paul Schaff). 6.45, Sports Notes. 7.0, Variety Programme. 8.10, Concert by the Station Orchestra, conducted by Buschköter. Soloists: Adelhild Ilolz (Soprano), and Walter Schneiderhan (Violin). 9.0, See Frankfurt. 9.20, See Stuttgart. 9.30, News. 9.45, See Stuttgart. 11.0, Programme to be Announced. 1.0 a.m. (Monday), Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—10.30 a.m., Ich habe genug—Cantata (Bach), by the Gewandhaus Orchestra, the Choir of St. Thomas, and Soloist. 11.0, Concert by the Station Orchestra, conducted by Hilmar Weber.

In the interval from 12 Noon to 12.25 p.m. Reading. 1.0, Weather and Time. 1.5, The Programme of the Week. 1.25, Agriculture: Notes. 1.35, Hallo, here is the Radio Zoo. 2.0, Trio in A minor, Op. 77b (Reger), by the Leipzig String Trio. 2.40, Talk: As German Exchange Student in Italy. 3.0, (from Dresden), Popular Concert. 4.30, Talk by Paul Fechter: New Principles in Art Appreciation. 5.0, Talk: A Musical Tour in the Baltic Provinces. 5.20, Pianoforte Recital of Classic Waltzes. 5.50, Talk: The Court Theatres of Central Germany. 6.35, Reminiscences of Felix Dahn. 7.0, Concert by the Leipzig Symphony Orchestra, conducted by Theodor Blumer. Soloists: Charlotte Boerner (Soprano) and Fritz Schertel ('cello). 9.0, News. 9.15 (approx.), Programme to be announced. 10.0, Dance Music Relay. 11.0 (approx.), Close Down. LINZ.—See Vienna.

**LUXEMBOURG**

252 kc/s, 1,191 metres; 200 kW.—12.0 Noon, Concert by the Radio Orchestra. 1.0, Gramophone Music. 7.0 till Close Down, English Programme. 7.0, Symphony Music on Gramophone Records: Violin Concerto (Elgar) Spanish Caprice (Rimsky-Korsakov). 7.45, Concert by the Radio Orchestra, conducted by Henri Pénis: Overture, William Tell (Rossini); Humoresque (Dvorák); Muzelndes Lütchen (Jensen); Hungaria Rhapsody, No. 2 (Liszt). 8.25, Violin Concerto (Dvorák), by André Cassedanne and the Radio Orchestra. 8.50, News in French. 9.0, Concert by the Station Trio. 9.30, Gramophone Music. 9.45, News in German. 9.55, English Songs on Gramophone Records. 10.15, Dance Music.

**MADRID**

ARANJUEZ (EAO), 10,000 kc/s, 30 metres 20 kW.—10.30 p.m., Concert of Light Music. In the interval at 10.45, Humorous Talk. 11.35, Talk. 11.45, Light Music. 12 Midnight to 12.30 a.m. (Monday), Concert by the I.B.C. (Ireland), Ltd.: Signature Tune, Come back to Erin; The Blue Danube; Only a Rose Pleas; Marta; The Russian Princess; The Flower of Hawaii; A Penny for your Thoughts; Just like in a Story Book; Signature Tune, Come back to Erin. 12.30, I.B.C. Good-night Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—8.0 to 9.0 a.m., Topical Review. 11.30, Municipal Band Concert, relayed from the Retiro. 2.0, Chimes, Time, Theatre Notes and Popular Concert. 4.0 to 7.0, Interval. 7.0, Chimes, Announcements and Dance Music relayed from the Ritz Hotel. 9.30, Chimes and Time. 9.35 (approx.), Variety Programme, followed by Dance Music, relayed from the Alkazar Dance Hall. 12 Midnight, Chimes. 1.0 to 2.0 a.m., Programme in English by the I.B.C. Popular Concert: Two Buck Tim from Timbuctoo (Goodhart); No I am in love; The Song of a Slave (Grener P.C. 123 (Butler); Dream Tangles (Schmann); Blue Prelude (Bishop); Under a Blanket of Blue (Symes); Learn to Croon (Coslow); Love is the thing (Washington Arrogancia; Moonstruck (Coslow); Spee; Easy; It's time to sing Sweet Adeline again (Davies); Margie (Davies); You're charming (Turk); Oh! Peter (Wiedoeft). 2.0, I.B.C. Good-night Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—6.20 p.m. Talk on Broadcasting Technique: Artificial Sounds. 6.50, See Bratislava. 9.20, S. Prague. 10.10 (approx.), Close Down.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 535 metres; and Nürnberg, 1,256 kc/s, 525 metres.—10.30 a.m., See Leipzig. 11.0, Concert from the Feldherrnhalle. 12 (Noon), Time, Weather and Programme Announcements. 12.10 p.m., Agricultural Talk. 12.30, Gramophone Concert of Light Music. 1.30, Chess Lesson. 2.0, Zither Solos. 2.20, I schlimmen Schuhe—Play (Trude Geisler). 2.40, Recital of German Songs, with Lute accompaniment. 3.10, Talk on Mythology. 3.30, Concert conducted by Erik Kloss. In the interval at 4.0 to 4.45, Radio Report of the International Football Match, Germany v. Belgium, relayed from Duisheim. In the second interval, Talk. 5.25, Talk on the following Transmission. 5.35, D. Rosenkavalier—Opera in Three Acts (Richard Strauss), relayed from the Nation Theatre. In the intervals, Sports Notes and News. 9.20, Time and News. 10.0, Serenade conducted by Erich Kloss. 11.0 (approx.), Close Down.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 45 metres; and Rjukan, 671 kc/s, 447.1 metres. 12 Noon, Symphony Concert, conducted

OCT. 22nd **SUNDAY** continued

Kiehlund. Soloist: Erik Bye (Bass). 4.0, Concert of Gramophone Music. 5.15, Agricultural Programme. 5.45, Readings. 6.15, Weather and News. 6.30, Recital of Karl Loewe Songs by Robert Dahl. 7.0, Time Signal. 7.1, Talk. 7.30, Concert by the Station Orchestra, conducted by Kramm. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Recitations. 9.45, Dance Music on Gramophone Records.

**OSTERSUND**.—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—9.25 a.m., Bible Reading. 9.40, Sacred Music. 10.5, Agricultural Talk. 11.45, Giornale Radio. 12 Noon to 1.0 p.m., Light Music. In the interval at 12.30, Time, Announcements and Weather. 4.30 to 5.30, Gramophone Music. 7.0, Doppolavoro Announcements and Giornale Radio. 7.20, Gramophone Music. In the intervals at 7.25, Sports Notes, and at 7.30, Time and Announcements. 7.45, Symphony Concert, conducted by La Rosa Parodi; Symphony No. 8 (Beethoven); Preludio infonico (Gavazzeni); Hiver-Printemps (Bach); Dances from Prince Igor (Borodin). In the intervals, Talk: Elizabeth Barrett Browning. After the Concert, News and Gramophone Music. 10.0, Giornale Radio.

**PARIS**

**EIFFEL TOWER**, Call FLE, 207.5 kc/s, 445.7 metres; 13 kW. Time Signals (on 1,650 metres) at 9.26 a.m. and 10.26 p.m. Preliminary and 6-dot Signals.—12.30 p.m., Concert by the Jean Bos Orchestra: Selection from The Count of Luxembourg (Lohár); Hungarian Czardas from The Dollar Princess (Fall); Overture, Oberon (Weber); Chant d'automne (Tchaikovsky); election from L'enfant prodigue (Debussy); Two Melodies (Grieg). In the interval at 4.0, News and Press Review. 2.0, Interval. 4.45, Le Journal Parlé. 7.30, Gramophone Concert; Part 1: Liszt Music in Commemoration of the Composer's Birth: Les reludes; Pianoforte Concerto; Rhapsody No. 2; Part 2, Light Music: Carnival (Guiraud). The Chinese Story Teller (Heinz); La lettre à Manon (Gillet). 8.20, The Italian Girl in Algiers—Opera (Rossini), played from the Opera-Comique.

**PARIS**

**POSTE PARISIEN**, 914 kc/s, 328.2 metres; 9 kW.—10.0 a.m., Gramophone Music. 10.10, Press Review. 10.30, Old French Songs (on Gramophone Records). 11.0, Concert. Overture, Zampa (Hérold); Waltz, Tales from the Vienna Woods (Joh. Strauss); Charm of the Orient (Dickers); Ronde des lutins (Nérini); Legy (Filippucci); Rag Doll (Brown); Suite from Gendriillon (Massenet); Charmaine (Rapé); Siciliana (Bocherini); Fantasia

on Melodies by Moretti; Pamplona (Cocleux). 12.10 p.m., Interval. 12.15, Sound Film Music on Gramophone Records. 12.45, Sponsored Programme. 12.50, Paul Weill in his Repertoire. 1.20, Interval. 1.30, Gramophone Music. 2.0 to 7.0, Interval. 7.0, Le Journal Parlé. 7.5, Sports Review. 7.15, Gramophone Music. 7.30, Catholic Review. 8.0, Rimsky Korsakov Music on Gramophone Records. 8.15, Interval. 8.30, Mais ne te promène pas donc pas toute nue—Comedy in One Act (Georges Feydeau). 9.0, Interval. 9.15, Sponsored Programme. 10.30, News.

**PARIS**

**RADIO PARIS**. Call CFR, 174 kc/s, 1,725 metres; 75 kW.—7.45 a.m., Gramophone Music. 8.0, Press Review and Weather. 8.30, Physical Culture. 10.0, Elementary Book-keeping Lesson. 10.20, Advanced Book-keeping Lesson. 12 Noon, Religious Address. 12.20 p.m., Sacred Music: Fugue in G minor (Bach); Confiteor Tibi; Tocata in A flat (de la Tombelle). 12.30, Gramophone Concert: Overture, Benvenuto Cellini (Berlioz); Meditation from Thaïs (Massenet); Masques et Bergamasques (Fauré); Aria from Benvenuto Cellini (Diaz); La poupée d'Arlequin (Darcy); Le temps des lilas (Chanson); Rédemption (Fraeuk); Magali (Mistral); Pot-pourri of Spanish Melodies (Oras); Granada (Nin); Prelude (Rachmaninov); Crépuscule (Almaby). In the interval at 12.45, Press Review, News and Weather. 1.30 to 2.30, Programme in English by the I.B.C. 1.30, Concert of Gramophone Records: Finlandia (Sibelius); Italian Serenade (Hugo Wolf); Selection from The Sleeping Beauty (Tchaikovsky); Sons in Feuillee (Thomé); Le Clocher de Dampierre et son carillon; La Berrichonne (Wachs). 2.0, Concert of Dance Music: Signature Time, Happy Feet; Happy as the Day is Long; Dinner at Eight; They all do the Rumba; Don't blame me; Sentimental Gentleman from Georgia; Hold your Man; There's a Cabin in the Pine; Heading for a Wedding; Signature Time, Happy Feet. 3.0 to 3.30, I.B.C. Programme in English by the I.B.C.: Clarke's Atlas Orchestral Concert: Grand March (Blake); Selection from W. H. Squire's Songs; Destiny Waltz (Baynes); Selection from Iolanthe (Sullivan); Selection from Hold Everything (de Sylva). 3.30 to 4.0, Popular Concert. 5.30, Concert of Light Music. 7.0, Variety Concert. 8.0, Gramophone Records. 8.30, The Italian Girl in Algiers—Opera (Rossini), relayed from the Théâtre National de l'Opera

Comique. In the interval at 9.15, Press Review and News.

**PITTSBURGH**

**KDKA**, 980 kc/s, 306 metres; 50 kW. Relay by W8XX on 48.86 metres and 25.27 metres.—5.30 to 6.30 p.m., Radio City Concert, from New York. 7.0, Boys of Wyne-castle. 7.15 to 10.0, New York Relay. 7.15, Autumn Idyll. 7.30, Variety Concert. 8.0, National Opera Concert. 9.0, Gould and Sheffer. 9.15, Morin Sisters. 9.30, Organ Recital. 10.0, Vesper Services. 10.30, Grand Hotel, from New York. 11.0, Pathé News. 11.15, Weather and Sports Notes. 11.30, Happy Felton's Orchestra. 12 Midnight to 2.45 a.m. (Monday), New York Relay. 12 Midnight, Vincent Lopez Orchestra. 12.30, Great Moments in History. 1.0, Light Opera Nights. 2.0, Gulf Headliners. 2.30, Walter Winchell. 2.45, Marvellous Melodies. 3.0, Mountain Music, from New York.

**PORSGRUND**.—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—10.10 a.m., Septet in E flat, Op. 20 (Beethoven). 11.0, Chimes and News. 11.15, See Bratislava. 12.30 p.m., Humorous Programme. 1.0, Talk for Farmers. 1.15, Announcements. 2.30, The Station Master—Farce in Three Acts relayed from the Burian Theatre. 5.0, German Transmission: Going Home—Four Poems (Lasker-Schüler) to Orchestral Accompaniment; Saul—Musical Drama (Reutter), followed by News in German. 6.0, Time and News. 6.5, Reading. 6.20, See Moravska-Ostrava. 6.50 to 9.20, See Bratislava. 9.20, News and Sports Notes. 9.40, Modern Czech Dance Music on Two Pianofortes. 10.10 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**SOTTENS**, 743 kc/s, 403 metres; 25 kW.; and **Geneva**, 395 kc/s, 760 metres.—8.55 a.m. (from Lausanne) Chimes. 9.0 (from Lausanne), Protestant Service. 10.0 (from Lausanne), Gramophone Concert. 11.30, News and Weather. 11.40, Concert by the Wireless Military Band, relayed from London. 12.30 p.m. (from Lausanne), Concert of Wine Festival Songs on Gramophone Records. 1.0, Interval. 2.0, Vintage Festival Concert by the Radio Lausanne Orchestra and the Martigny Choral Society, with Commentaries, relayed from Martigny. 4.0, Interval. 5.0 (from Lausanne), Pianoforte Recital. 6.0 (from Lausanne), Reli-

gions Address. 6.30 (from Lausanne), Sports Notes. 7.0 (from Lausanne), Concert by the Löffler Vocal and Instrumental Quartet. 8.0, Concert by the Radio-Suisse Romande Orchestra, conducted by Echenard. 9.0, News and Weather. 9.15 (approx.), Close Down.

**RJUKAN**.—See Oslo.

**ROME**

**Call 1RO**, 680 kc/s, 441 metres; 50 kW. Relay by Naples, 941 kc/s, 319 metres; **Milan (Vigentino)**, 662 kc/s, 453.2 metres from 8.0 p.m. (approx.) and **2RO**, 11,810 kc/s, 25.4 metres from 4.15 p.m.—9.0 a.m., Announcements and Sports Notes. 9.30, Agricultural Report. 9.45, Bible Reading. 10.0 to 11.0 (approx.). See Turin. 11.30, Gramophone Music. 11.45 to 1.0 p.m., See Turin. 1.0 to 1.15 p.m. (approx.), Time and Announcements. 2.30 (approx.), International Football Match, Italy v. Hungary, relayed from Budapest. 4.0, Sports Notes. 4.15, Vocal and Instrumental Concert: Bruna Franchi (Violin), Vella Capuano (Soprano), Carlo Platania (Baritone) and Giuseppina Marciano (Songs). In the interval at 5.0, Sports Notes. 5.30 to 5.40 (approx.), Weather. 6.30, News. 6.45, Pianoforte Solos. 7.0, Time and Announcements. 7.25, Sports Notes. 8.0, Two Operas (Mascagni), conducted by the Composer, relayed from the Argentina Theatre: (a) Pinotta—Opera in One Act, (b) Cavalleria rusticana—Opera in One Act. In the intervals, Talk and Poetry Reading. After the Programme, Giornale Radio.

**SALZBURG**.—See Vienna.

**SCHENECTADY**

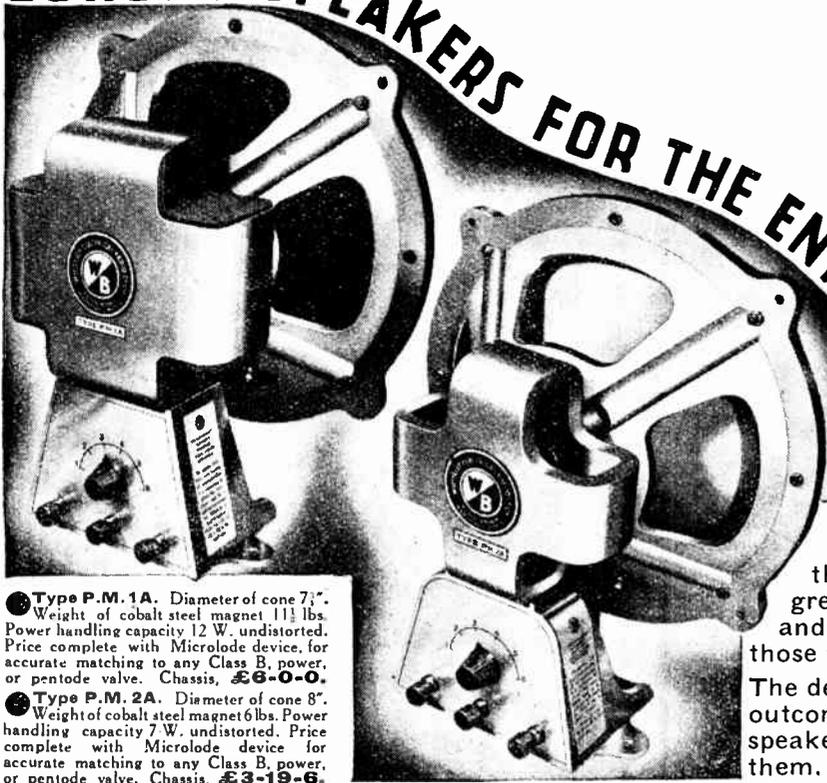
**WGY**, 790 kc/s, 379.5 metres; 50 kW. Relay at intervals by **W2XAF** on 31.48 metres, and by **W2XAD** on 19.56 metres.—7.0 p.m. to 8.45 p.m., New York Relay. 7.0, Gene Arnold and the Commodores. 7.15, Pop Concert. 7.45, Gems of Melody. 8.0, Wayne King's Orchestra. 8.30, Radio Pulpit. 12.45 a.m. to 3.30 a.m. (Monday), New York Relay. 12.45, Songs by Wendell Hall. 1.0, Popular Programme. 2.0, Manhattan Merry-Go-Round. 2.30, American Album of Familiar Music. 3.0, Jack Benny; Frank Black's Orchestra. 3.30, Impressions of Italy, from New York, followed by Programme Resume.

**SCHWEIZERISCHER**

**LANDESENDER**

**BEROMUNSTER**, 653 kc/s, 450 metres; 60 kW.; **Basle**, 1,229 kc/s, 244.1 metres; and **Berne**, 1,220 kc/s, 245.9 metres.—9.0 a.m. (from Basle), Protestant Service. 9.45 (from Basle), Old Swiss Chamber Music by the Bentz Quartet. 10.30 (from Basle), Literary Programme. 11.0 (from Basle), Gramophone Music. 11.30, Time, Weather and News. 11.40 (from Zurich), Concert by the Radio

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OCT. 22nd SUNDAY continued

Orchestra. 12.30 p.m., Concert by the Wireless Military Band, relayed from London. 1.30, Interval. 3.0 (from Basle). Variety Concert on Gramophone Records. 4.0 (from Basle), Agricultural Programme. 5.30, from Basle). Talk on Swiss Week. 6.0, (from Basle), Gramophone Concert of Swiss Music. 6.50 (from Basle), Variety Programme. 7.50, News. 8.0 (from Basle). Organ Recital, relayed from the Cathedral. 9.15 (from Basle), Sports Notes and Close Down.

SOTTENS.—See Radio-Suisse Romande.

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Östersund, 389 kc/s, 770 metres, and Sundsvall, 554 kc/s, 542 metres.—8.0 a.m., Rural Programme. 8.30, Gramophone Music. 9.10, Programme for Workers. 10.0, Divine Service. 11.45 to 12 Noon, Weather. 1.0 p.m., Choral Concert, relayed from the Cathedral, Uppsala, 662 kc/s, 453.2 metres. 2.0, Gramophone Music. 3.0, Elementary English Lesson. 3.30, Programme for Children. 4.5, 'Cello Recital by Gustav Gröndahl: Sonata in G minor (Beeches); Largo (Mareello); Elegy (Faure); Minuet (Debussy). 4.30, Reading. 5.0, Evensong. 6.35, Orchestral Concert, conducted by Nils Grevillius. 7.50, The fantastic Battle—Play (Bailly). 9.0, Military Band Concert, conducted by Per Grundström. 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—9.30 a.m., Orchestral Concert, conducted by Maurice de Villers. 10.45, Protestant Service in German. 11.30, Catholic Service. 12 Noon, Tchaikovsky Music on Gramophone Records. 12.45, News. 1.0, Time Signal. 1.1, Radio Report on the Vintage in Alsace. 2.30, Agricultural Talk. 2.45, Interval. 3.30, Light Music on Gramophone Records. 4.15, Talk: The Red Cross Society. 4.30, Symphony Concert by the Pasdeloup Concert Society, relayed from Paris. 6.30, Medical Talk in German. 6.45, Sports Notes. 7.0, Light Music on Gramophone Records. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Dramatic Programme: (a) Obsessions—One-Act Radio Play (Cita and Suzanne Malard). (b) Le bon grain—One-Act Play (Boussac de St. Mare). (c) Parrain—Comedy in Three Acts (Oudon). In an interval at 9.30, Press Review. 10.30, Dance Music, relayed from the Savoy. 12 Midnight (approx.), Close Down.

STUTTART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570

metres.—10.30 a.m., See Leipzig. 11.0, Richard Strauss Concert by the Station Orchestra, conducted by Ferdinand Probst: Soloist: Prof. Bassermann (Violin); Concerto for Violin and Orchestra, Op. 8; Symphonic Poem, Don Juan. 12 (Noon), Topical Talk. 12.15 p.m., Gramophone Records of Light Music. 1.15 (from Karlsruhe), Talk: The Noble Traditions of German Handwork. 1.30, See Frankfurt. 2.30, Choral Concert. 3.0, See Frankfurt. 5.0, Our Homeland—a Sequence of Relays—No. 41—The Vintage Festival in the Bottwar Valley. 5.45, Sports Notes. 6.0 (from Karlsruhe), Talk, with Gramophone Illustrations: Memories of the Seaside. 6.40, From Pirna to Burma—the Humour of the Nations. 7.10 (approx.) to 9.0, See Langenberg. 9.0, See Frankfurt. 9.20, Talk: You must know... 9.30, Local News. 9.45, Hasenpfeffer—a Merry Hunting Programme. 11.0, Serenade from Frankfurt. 1.0 a.m. (Monday), Close Down.

SUNDSVALL.—See Stockholm.

TOULOUSE

RADIOPHONIE DU MIDI; 779 kc/s, 385 metres; 8 kW.—11.0 a.m., Dance Refrains. 11.15, Military Music. 11.30, Sound Film Music. 11.45, Accordion Music. 12.0 Noon, Concert by a Symphony Orchestra. 12.30 p.m., Catholic Service. 12.45, Popular Melodies. 1.0, Amusement Guide, Market Prices and Time. 1.5, Music by a Viennese Orchestra. 1.15, Opera Music: Selection from Tannhäuser (Wagner); Sigurd (Reyer); Così fan tutte (Mozart); L'Africaine (Meyerbeer); and Prince Igor (Borodin). 1.45, Protestant Service. 2.0, Light Music. 2.15, Agricultural Talk. 2.30, Extracts from the Tales of Hoffmann—Opera (Offenbach). 2.45, Orchestral Music. 3.15, Chansonnnettes. 3.30, Concert by a Viennese Orchestra. 4.0, Operetta Music. 4.15, Concert of Opera Music: Extracts from Rigoletto (Verdi), The Huguenots (Meyerbeer), Aida (Verdi), and La Bohème (Puccini). 4.45, Music by an Argentine Orchestra. 5.0, Thé dansant. 5.45, Military Music. 6.0, News. 6.15, Sound-Film Music. 6.30, Hunting Horn Solos. 6.45, Accordion Music. 7.0, Popular Orchestral Melodies. 7.15, News and Racing Results. 7.30, Operetta Music. 8.0, Extracts from Operas: L'Africaine (Meyerbeer), Lohengrin (Wagner), and Samson and Delilah (Saint-Saëns). 8.15, Popular Melodies. 8.30, Music by a Viennese Orchestra. 8.45, Choral Music.

9.0, Symphony No. 6—the Pastoral (Beethoven). 9.45, Opera Music. 10.15, North African News and Local News. 10.30, Concert for Listeners in Morocco. 11.0, Music by an Argentine Orchestra. 11.15, Light Music. 11.30, Chansonnnettes. 11.45, Saxophone Solos. 12.0 Midnight, News, Weather and Announcements. 12.5 a.m. (Monday), Music by a Viennese Orchestra. 12.15, Popular Music. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—8.40 a.m., See Turin. 8.55, Mass from the Cathedral of San Giusto. 10.0, Religious Address. 10.20, Agricultural Talk. 11.0 (approx.) till Close Down, See Turin.

TRONDHEIM.—See Oslo.

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres, Genoa, 959 kc/s, 312.8 metres.—8.40 to 8.55 a.m., Giornale Radio. 9.40, Agricultural Talk. 10.0, Mass from the Church of the Annunciation, Florence. 11.0 to 11.15, Bible Reading. 11.30, Gramophone Music. 11.45, Request Music. 12 Noon to 12.15 p.m. (approx.), Time Signal and Announcements. 12.15 (approx.) to 1.0, Variety Concert. 2.30 (approx.), International Football Match, Italy v. Hungary, relayed from Budapest. 3.0, Gramophone Music. 4.0 to 5.0, Concert of Light Music. In the intervals, Football and General Sports Results. 5.0, Second Sports Results. 5.15 to 5.20, Weather. 6.0, Time and Football Report. 6.15, Gramophone Music. 7.0, Time, Announcements. 7.30, La Collona della Regina, Musical Play (Storuci). 8.0, Talk. 8.15, Variety Programme. 9.15, News. 9.30, Dance Music. 10.0, Giornale Radio.

VIENNA

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres, and Salzburg, 1,373 kc/s, 218.5 metres.—9.0 a.m., Recital of Bach Pianoforte and Organ Music. 9.30, Talk: The Art of enjoying oneself. 9.50, Recital of Songs by Anton Tausche (Bartone). 10.20, Religious Programme. 11.0, Concert by the Wiener Symphoniker, conducted by Carl Alwin. Soloist: Cornelius Czarniawski

(Pianoforte). 1.30 p.m., Time, Programme Announcements and Press Review. 1.45, Agricultural Talk. 2.5, Review of Religious Books. 2.30, Wind Instrument Concert. 2.45, Radio Report of the Austria Prize from the Freudenau Race Course. 3.15, Concert (contd.). 4.0, Talk: The Klobitz Family. 4.30, Chamber Music by the Popa Grama Quartet: String Quartet in A Minor, Op. 29 (Schubert); String Quartet in G (Pfitz Rieger). 5.30, Johanna Wessely and Fritz Weinger read from their own Works. 6.0, Concert by the Wiener Symphoniker, conducted by Rudolf Niltus. Soloist: Richard Obroposov (Violin). In an interval at 6.30, Time, Sports Notes and Announcements. 7.30, The Duchess of Chicago—Operetta on Two Acts (Kálmán). In the interval at 8.45, News. 9.45, Announcements. 9.55, Gramophone Concert of Light Music.

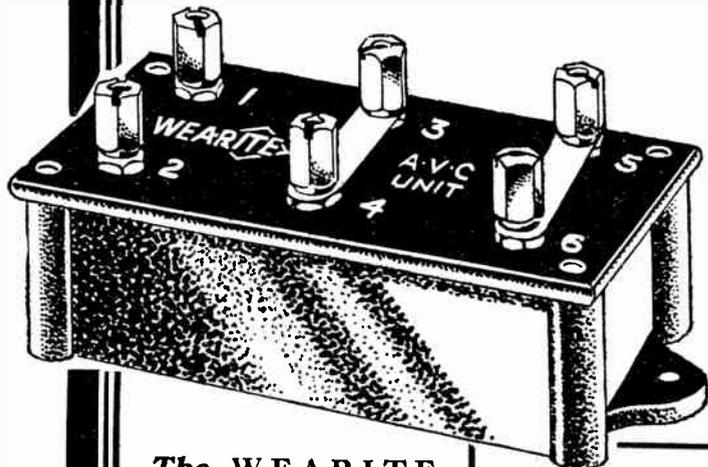
WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—8.0 a.m., Time Signal and Sacred Music. 8.5, Gymnastics. 8.20, Gramophone Music. In an interval at 8.35, Radio Journal. 8.52, Hints for the Housewife. 8.55, Programme Announcements. 9.0, Divine Service, relayed from Cracow, 959 kc/s, 312.3 metres. 9.45, Sacred Music on Gramophone Records. 10.57, Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Programme Announcements. 11.10, Weather Report. 11.15, Concert of Operetta Music by the Philharmonic Orchestra, conducted by Gorzyski. Soloists: Dudiez (Soprano) and Wawrzakowicz (Tenor). In an interval at 12 Noon, Talk. 1.0 p.m., Agricultural Talk. 1.15, Agricultural Prices. 1.20, Concert of Polish Songs by the Zaremba Choir. Soloist: Karwowska (Soprano). 2.0, Agricultural Talk. 2.20, Programme from Lwów 788 kc/s, 381 metres. In the interval, News 3.0, Programme for Children. 3.30, Gramophone Music. 3.45, Recitations. 1.0, Talk. 4.15, Talk, relayed from Cracow. 5.0, Dramatic Programme. 5.40, Dance Music on Gramophone Records. 6.5, Miscellaneous. 6.30, Topical Talk for Young People. 6.45, Programme Announcements. 6.50, Concert by the Station Orchestra, conducted by Nawrot. Soloist: Ola Obarski (Songs). Festival March (Kasperek) Indian Ballet Suite from Lakmé (Delibes) Songs; Intermezzo, Bib et Bob (Domaret) Waltz, Vision (Waldteufel); Songs; Overture, Chal Romano (Kettelbey); Gallantry (Kettelbey); Mazurka (Namyslowski). 7.50, Radio Journal. 8.0, Topical Talk. 8.15, Humorous Programme, relayed from Lwów 9.15, Sports Notes. 9.25, Dance Music from the Adria Café. 10.0, Aviation Weather Report and Police Notes. 10.5, Dance Music Relay (contd.).

ZURICH.—See Schweizerischer Landessender

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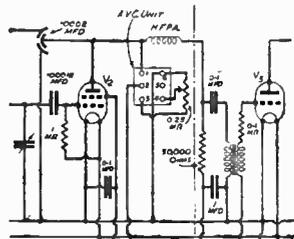


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**ALGIERS**

824 kc/s, 364 metres; 13 kW.—7.20 p.m., Songs from Operetta. 7.55, News. 8.0, Time and Lottery Results. 8.10, Concert by the Station Orchestra: Overture, Euryanthe (Weber); Waltz, Iberia (Grieg); Selection from Tosea (Puccini); Selection from Messidor (Bruneau); Spanish Dance (Gounod); Italian Dance (Gounod); Tambourin chinois (Kreisler); Selection from Etienne Marcel (Saint-Saëns). In the intervals at 8.45, News, and at 8.50, Gramophone Music. 9.30, News. 9.35, Songs from Sound Films. 9.55, News.

**ATHLONE**

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations, and Gramophone Concert. 6.0, Programme for Children. 6.45, News. 7.0, Gaelic Talk. 7.15, Talk by Captain C. J. McGuinness: Life in the Arctic Circle. 7.30, Time Signal. 7.31, The Station Orchestra. 7.45, Contralto Solos by Nora Finn. 8.0, The Station Orchestra. 8.10, Tenor Solos by Ben Williams. 8.25, Soprano Solos by Edie O'Dwyer. 8.40, Concert by the Folies Revue Company, with the Station Orchestra. 9.30 to 10.30, Programme by the I.B.C. (Ireland) Ltd. 9.30, Concert of Dance Music: Home-made Heaven (Rainger); Stormy Weather (Arlen); The Whisper Waltz (Burke); Good-night but not Good-bye (Michael). 9.45, The Adana Concert: Fairy Tale (Heykens); Trio: St. Louis Blues (Hady); Pianoforte Solo: Selection from A Bedtime Story; Swanee (Gershwin). 10.0, Concert arranged by the International Broadcasting Company (Ireland) Ltd.: In the Park in Paris (Rainger); Street of Dreams (Young); Sarita Tango; Racking Commentary; Le Million (Bernard); Lucky Xylophone (Inns); Hello, Montreal (Warren); The Whisper Waltz (Burke). 10.30, I.B.C. Good-night Melody, followed by News and Weather. 10.40, Gaelic Programme. 11.0 (approx.), Close Down.

**BARCELONA**

EAJ1, 860, kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert. Selection from This (Massenet); Serenata a Toscanini (Murzilli); Romanca (Cui); Minuet (Paderewsky); Selection from Martha (Flotow); Melody (Fauré); Turkish Rondo (Mozart). 7.0, Request Gramophone Records. 7.20, Sports Notes. 7.30, Exchange and Talk in Catalan. 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices. 9.5, Humorous Review of the Week in Verse. 9.15, Concert of Sardanas. 10.0, Concert by the Station Orchestra. Overture, The Merry Wives of Windsor (Nicolaï); Piece (Mozzovsky); Dance of the Hours from La Gioconda (Ponchielli). After the Concert, Light Music, relayed from the Café Españaol. In the interval at 11.0, News. 12 Midnight (approx.), Close Down.

**BARI**

1,112 kc/s, 269.8 metres; 20 kW.—11.30 a.m., Quintet Concert. 12 Noon to 3.30 p.m., See Rome. 3.30, Gramophone Music. 3.55 to 5.35, See Rome. 5.35, News in Albanian. 5.45 (approx.) till Close Down, See Rome.

**BASEL**.—See Schweizerischer Landessender.

**BELGRADE**

697 kc/s, 430.4 metres; 2.8 kW.—6.0 p.m., Talk. 6.30, Song Recital. 7.0, 'Cello Recital. 7.30, Concert by the Station Orchestra. 8.30, Concert of National Songs by Mme. Milivojevic and the Station Orchestra. 9.0, Time and News, followed by Cigány Music from the Djordjevic Restaurant. 9.50, Dance Music on Gramophone Records.

**BERLIN**

**DEUTSCHLANDSENDER (REICHSENDER)**, 183.5 kc/s, 1,635 metres; 60 kW.—11.0 a.m., Weather. 11.5, Gramophone Concert: Schubert Paraphrase for Pianoforte Trio; Waltz, Daisy (Dacre); Fascination (Marchetti); Overture, Zampa (Hérold); Turkish March (Mozart); Waltz in E Minor (Chopin); Kuss Walzer (Strauss); Wiegenlied (Weber); 'Zuschau (Bohm); Waltz, Wolga, Wolga (Noack); Die Hydropathen (Gungl). 11.55, Time Signal. 12.45 p.m., News. 1.0, Gramophone Concert: Scherzo and March from the Sixth Symphony (Tchaikovsky); Scherzo capriccioso (Dvorák); Kubelik-Serenade (Drdla); Souvenir (Drdla); Liebestraum No. 3 (Liszt); Die Flöte von Sansouci (Graener); Tarantella (Liszt); Movement from the Italian Caprice (Tchaikovsky). 2.0, Talk for Women. 2.30, Weather and Exchange. 2.45, Review of Books. 3.0, Concert from Breslau. 4.0, Talk: National Health and Schools. 4.25, Violin Recital. 4.40, Song Recital by Gertrud Callam (Coloratura Soprano): Two Songs (Mozart): (a) Mia speranza adorata, (b) Aria from Il re pastore, Aria from Ariadne auf Naxos (Richard Strauss). 5.0, Poems. 5.6, Talk for Young People. 5.15, Radio Report from a Commercial Training College. 5.45, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, To-day's Memo. 7.15, Talk: A Music Collection. 7.45, Marien-Kantata (Contata of the Virgin Mary)—for Soloists, Choir and Orchestra. Op. 99 (Graener), relayed from the Sing-

akademie. The Philharmonic Orchestra, conducted by Prof. Georg Schumann, the Singakademie Choir, Frau von Forbacher, Hilde Elgers, Heinz Marten and Prof. Albert Fiacher. 8.25, Variety Programme. 9.0, News, followed by a Report of a Gymnastic Display (on Gramophone Records). 9.45, Weather. 10.0, Concert from Hamburg. 11.0 (approx.), Close Down.

**BERLIN**

**FUNKSTUNDE**, 715 kc/s, 419.5 metres; 1.5 kW.—3.30 p.m., Concert from the Haus Vaterland. Waltz, Mein Baden (Komzak); Wedding Day on Trolldhaugen (Grieg); Spring Serenade (Lacombe); Serenata appassionata (Steiner); Tango: Kleiner Mann, was nun? (Böhmet-Busch); Waltz: An der Donau wenn der Wein blüht (Melichar-Grothe); Tango: (Lesso-Valerio); Mein Berlin, du mein Berliq (Steinger-Amberg); Potpourri, Servus Wien (Dostal). 4.30, The Model German: Interviews with Dietrich Eckart, Arno Ilolz and Ernst Stadler. 4.50, Animal Tales in Dialect. 5.10, String Trio in C Sharp Minor (Ernst Lothar von Knorr), for Violin, Viola, Cello and Soprano, after Der siebente Ring (Stefan George). 5.30, Funkstunde informs its Listeners... 5.45, Topical Talk. 6.0, Transmission for all German Stations. Concert in Memory of Rudolf Peterka. The Berlin Wireless Orchestra, conducted by Otto Frickhoefer. Triumph des Lebens, Op. 8, Rhapsodie Prelude for Augmented Orchestra (Rudolf Peterka); The Eroica Symphony (Beethoven). 7.0, Lottery Announcements. 7.5, Programme, relayed from the Municipal Theatre, Stettin. 9.0, Weather and News. 9.15 (approx.), Dance Music from the Zoological Gardens. In the interval from 10.0 to 10.5, A Warning by the Chief of Police. 11.0 (approx.), Close Down.

**BERNE**.—See Schweizerischer Landessender.

**BEROMUNSTER**. — See Schweizerischer Landessender.

**BODEN**.—See Stockholm.

**BODO**.—See Oslo.

**BRATISLAVA**

1,076 kc/s, 279 metres; 14 kW.—5.0 p.m., Concert by the Station Quartet. 5.55, Talk for Housewives. 6.0, See Prague. 6.10, See Brno. 7.25, See Prague. 8.0, Choral and Instrumental Concert arranged by the Cathedral Union for Sacred Music, relayed from the St. Martin's Cathedral. Conductor: Prof. Alex Albrecht. 9.0, See Prague. 9.15 (approx.), Close Down.

**BREMEN**.—See Hamburg.

**BRESLAU**

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.5 p.m., Lortzing Concert on Gramophone Records. Overture, Der Waffenschmid; Selection from Czar and Carpenter; Selection from Der Wildschütz; Ballet Music from Undine; Aria from Undine; Bass Solo from Der Waffenschmid; Potpourri of Lortzing Music. 12.45, Time and News. 1.10, German Songs from the Fourteenth to the Nineteenth Century—Recital by Margarete Forner (Soprano): Nachtlied (Nägeli); Pomeranian Folk Song (Birlinger Greclius); Der Rosenstock (Himmel); Waldvögelin; Hoffnung (Reichardt); Frühlingsliebe (Schulz); Die rechte Stimmung (Telemann); Das Lösegeld (Reichardt); Mondeshelle Weinlich; Folk Song, Die Lore (arr. Silcher). 1.40, Programme arranged by the Post Office, with Gramophone Records. 2.0, Market Prices. 2.15, Review of Nature Books. 2.35, Talk on Astrology. 3.0, Concert by the Station Orchestra, conducted by Rischka. Beethoven-Ouverture, conducted by Schubert-Abend in Alt-Wien (Ralf); From the Kinderalbum (Tchaikovsky); Waltz from Faust (Gounod); Ballet Music from Rienzi (Wagner); Andalusian Serenade (Eilenberg); A Mignonne (Schütt); Prayer and Temple Dance (Grieg); Romance (Kahnst); Melody (Staub); Immer höher (Gangherger). 4.45, Market Prices, followed by Archaeological Talk. 5.10, Topical Talk. 5.30, Talk: New Laws. 6.50, Meat Market Prices. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, News. 7.10, Concert by the Station Orchestra, conducted by Topitz. Overture, Turandot (Weber); Selection from Tosca (Puccini); Selection from Das Nachtlager in Granada (Kreutzer); Ballet Suite, Les Petits Riens (Mozart); Waltz from Eugene Onegin (Tchaikovsky); Old Syrian Play and Dance Music (Pachernegg). In an interval from 7.45 to 8.15, Reading from the Works of Hans Carossa. 9.0, See Munich. 9.20, Time and News. 9.45, Wireless Technical Talk. 9.55, Talk on the Cinema. 10.15 (approx.), Close Down.

**COPENHAGEN**

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time and Chimes from the Town Hall. 11.5 to 1.0 p.m., String Ensemble Concert, relayed from the Hotel d'Angleterre. 2.20, Talk for the Housewife. 2.30, Concert by Carl Rydahl's Instrumental Ensemble: Overture, Deux vieilles gardes (Delibes); Waltz, Le retour de printemps (Waldteufel); Selection from Thaïs (Massenet); Intimité (Mozzowsky); Barcarolle, Le beau rêve (Flégier); Adagio and Fantomime from Les petits riens (Mozart); Reading; Ballet Overture (Lincke); Waltz, Ballerine (Gillet); Selection from Countess Maritza (Kálmán); Intermezzo, Peppina (Mamburo); Abendlied (Schumann); Humoresque (Dvorak); Spanish March (Gyldmark). 4.30, Exchange and Fish Market Prices. 4.45, Talk in German: Vienna and Berlin. 5.15, English Lesson for Beginners. 5.45, Weather Forecast and Announcements. 6.0, News. 6.15, Time Signal. 6.30, Talk. 7.0, Chimes from the Town Hall. 7.5, With the Microphone among the Danish Weavers. 7.30, Dupuy Concert by the Radio Orchestra, conducted by Emil Reesen. Soloist: Erik Thomsen (Flute). Overture, Youth and Madness; Flute Concerto; March No. 1 in F. In the interval, Talk: Don Juan. 8.30, Song Recital by Per Knudsen. 8.45, News. 9.0, Concert by the Station Symphony Orchestra, conducted by Emil Reesen. Soloists: Ole Frösig (Clarinet), Rudolf Dietzmann ('Cello) and Folmer Jensen (Pianoforte). Symphony in C (Bangert); Suite for Clarinet, 'Cello and Pianoforte (Sehested). 10.0, Dance Music, relayed from the Lodberg Restaurant. 11.30 (approx.), Close Down.

**CORK**.—See Athlone.

**DANZIG**.—See Heilsberg.

**DRESDEN**.—See Leipzig.

**FECAMP**

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. till 12 Noon, Programme in English by the I.B.C. 11.0, Happy Hour: Part I—Orchestral Music; Signature Tune; A Radio Roundabout (Noack); Xylophonia (Green); Romance (Löhrr); The Golden Musical Box (Krome); Snappy Sticks (Robbins); Wiener Praterleben (Translatour); Pride of the Wolfines (Sousa); Part II—Request Programme of Banjo Solos: Orchestra: Danse Bagatelle (Bourdon); Cracker Jack (Roser); Fashionette (Glogaw); Orchestra: The Toy-maker's Dream (Golden); Flapperette (Greer); St. Louis Blues (Hardy); The Wedding of the Painted Doll (Brown); Orchestra: That Tiny Teashop (Raymond); Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.30, The I.B.C. Nursery Corner. 5.0, Concert of Sea Shanties for Chichester and Bognor; Signature Tune, The Night by the Sea; A Life on the Ocean Wave (Binding); The Drunken Sailor (arr. Terry); One Dollar Fifty a Day; A Rovin' (Terry); The Middy March (Alford); Rio Grande (arr. Harris); Shenandoah (Terry); Selection from Nautical Moments (arr. Winter). 5.30, Orchestral Concert for Hastings and Eastbourne; Vienna, City of my Dreams (Sieczynski); The Warbler's Serenade (Perry); Night Aboard the Saucy Sue; The Valley of the Poppies (Ancliffe); Selection from Wild Violets (Stolz); Song, Cloze Props (Charles); Birthday Serenade (Lincke); Demande et Réponse (Coleridge-Taylor); Signature Tune. 6.0, Programme in French. 10.0 (approx.) till Close Down, Programme in English by the I.B.C.: Signature Tune. Bells of Normandy; At the Old Pig and Whistle; I bring a Song; Flor de Cuba; Let's make it up; I always keep my Girl out late; Sundown in a Little Green Hollow; Happy as the Day is long; Aloha Oe! Isn't it Heavenly; Sweet Dreams, Pretty Lady; Carry me back to Green Green Pastures; Wood Violets; Lazybones; Wedding of the Dragonflies; Don't blame me; P.C. 123 (The Policeman's Song); Louisiana Lullaby; Signature Tune. 11.0, Talkie Time; Tunes from the Talkies; Signature Tune, Sittin' in the Dark; The Good Companions; Louisville Lullaby; Falling in Love again (Hollander); The Moment I saw you (Gay); I lost my Girl from Memphis; Make a Talkie (Clapham and Dwyer); To-day I feel so Happy (Carter); Selection from Music in the Air; Signature Tune. 11.30, Club Concert for Salisbury Listeners: Part I—Orchestral and Organ Music; Signature Tune, The Chum Song; Waltz, Gold and Silver (Lehar); Around the Volga (Borchert); In the Camp of the Ancient Britons (Ketelbey); Organ Solo: Sweet and Low (Barbny); Waltz, Tales from the Vienna Woods (Joh. Strauss); Bells across the Meadow (Ketelbey); Organ Solo: Träumerei (Schumann); Waltz from The Gipsy Princess (Kálmán). 12.5 a.m. (Tuesday), Late News Bulletin in English. 12.10 (approx.), Club Concert: Part II—I'll take an Option on you (Rainger); Tea for Two, from No, No, Nanette (Youmans); If you were the only Girl in the World; I've got to pass your House to get to my House (Brown); Forever (Sievier); Signature Tune. 12.30, Light Music: Poor Butterfly (Bendix); A Girl like Nina (Abraham); Xylophone Solo: Dance of the Marionettes (Gaston); Five-Fifteen (Hall); Louisiana Lullaby (Newman); War Marching Songs; Ding Dong Ding (Hargreaves); Old Music Hall Memories. 1.0,

**BRNO**

878 kc/s, 342 metres; 35 kW.—6.10 p.m., From Town to Village—a Musical Potpourri (arranged by V. Konupka). A Vocal Quartet, Folk Band and the Station Orchestra, conducted by J. Polasek. Soloists: M. Bakalová and J. Jaros (Songs). 7.10, Talk. 7.25, See Prague. 8.0, Janacek Concert arranged by the Club of Moravian Composers, relayed from the Czech Club House. 8.40, Reading. 9.0, See Prague. 9.30 (approx.), Close Down.

**BRUSSELS (No. 1)**

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra: Marche processionnelle (Wéry); Gracieuses pirouettes (Wéry); Causerie intime (Deveux); Darnoiselle et Darnoiselle (Daneau); Danse lente (César Franck); Flute Solo: Souvenir de Spa (Meurice); Printemps d'amour (Kalkman); Oh peut-on être mieux? (Grétry); Sérénade païenne (Demaret); Selection from The Pink Lady (Caryll). 1.0 p.m., Le Journal Parlé. 1.10, Gramophone Music. 5.0, Concert by the Station Symphony Orchestra, conducted by Meulemans. Souvenirs (Jehin); Fantaisie burlesque (Rogister); Symphony in G Minor (Mozart). 6.0, Talk on the Walloon Language. 6.15, Gramophone Music. 6.30, Concert by the Small Station Orchestra, conducted by Leemans. 7.15, Talk: The Walloon Movement. 7.30, Theatre Notes and Film Review. 8.0, Concert by the Station Symphony Orchestra, conducted by Meulemans Soloist: Mlle. Berthe Parmentier (Songs). Contredanse et gigue (Grétry); Les danseuses de Kerlouan (Daneau); Cœur d'ognon (Dupuis); Songs: (a) Souvenance (César Franck), (b) Songs from Fleurs d'après-midi (Samuel); Fantasia on Angevin Themes (Lekeu); Waltz caprice (Jehin). 9.0, Gramophone Music: Quartet inachevé (Lekeu); Pianoforte Concerto in C Minor (Rachmaninoff). 10.0, Le Journal Parlé.

**BRUSSELS (No. 2)**

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—12 Noon, Gramophone Concert. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Die schöne Galathee (Suppé); Flute Solo: Seherzo, Fanfaluca (Gillon); Ballet Music from Les petits riens (Mozart); Waltz, Roses from the South (Joh. Strauss); Selection from The Cid (Massenet); Scene and Waltz from Gretna Green (Guiraud); March, The Phantom Brigade (Myddleton); Melody (Candiolo). 5.0, Gramophone Music. 5.45, Programme for Children. 6.30, Ballet Music on Gramophone Records. 7.12, News. 7.15, Talk for Ex-Servicemen. 7.30, Theatre Notes. 8.0, Gramophone Music: Schelerazade (Rimsky-Korsakov); Finlandia (Sibelius). 8.45, Reading (Timmermans). 9.0, Concert by the Station Symphony Orchestra, conducted by Meulemans: Overture, Tannhäuser (Wagner); La forêt enchantée (d'Indy); Two Songs (Baeyens); Fantasia on Flemish Motives (de Boeck); Ballet Music from Hérodiade (Massenet); Waltz, La Housarde (Ganne). 10.0, Le Journal Parlé.

**BUCHAREST**

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra: Polish March (Leopold); Waltz-Intermezzo (Siede); Overture, The Caliph of Bagdad (Boieldieu); Chinese Suite (Niemann); Selection from Mignon (Thomas). 5.0, Radio Journal. 5.15, Song Recital. 5.30, Concert (contd.). Selection from Frederica (Lehar); Chaconne (Durand); Characteristic Piece (Eilenberg); Danse lente (Franck); Oriental Fantasia (Rust). 6.0, Educational Talk. 6.20, Symphony Music on Gramophone Records. 6.40, Talk. 7.0, Introductory Talk to the following Transmission. 7.10, Pianoforte Recital by Nadia Chebab: Sonata (P. E. Bach); Sonata (Haydn). 7.30, Talk. 7.45, Song Recital. 8.15, Quintet in F Minor (César Franck). 8.45, Radio Journal. 9.0, Romanian Music by the Station Orchestra.

**BUDAPEST**

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 6.40 p.m. (approx.) till Close Down.—4.0 p.m., Orchestral Concert, relayed from the Café Spolarich. 4.40, Talk. 5.10, Recital of Pianoforte Duets by Berzsenyi and Stefan Villax. 6.0, Reading. 6.40, Jubilee Concert by the Philharmonic Society, conducted by Ernst Dohnányi. Soloists: Maria Basildes (Songs) and Ernst Dohnányi (Pianoforte). Festival Overture (Erkel); Hungarian Folk Songs (Bela Bartok); Hungarian Dances (Kodály); Variations (Dohnányi); Pianoforte Solo: Hungarian Fantasia (Liszt); Symphony No. 1 (Beethoven). 9.0, News. 9.15 (approx.). Concert by the Béla Bodrics Cigány Band from the Café Partia. 10.30, Dance Music from the Café Partia.

**CASSEL**.—See Frankfurt.

OCT. 23rd **MONDAY** continued

Dance Music: Signature Tune, Bells of Normandy; Egypt; Limehouse Blues; You're getting to be a habit with me; I've found the Right Girl; My Moonlight Madonna; Sing Another Line; I'm getting Sentimental over you; I'll show you off; Whistling under the Moon; Cornflowers and Poppies; Oh! Johanna; Let's call it a Day; Stay out of my Dreams; Adorable; Learn to Croon; Blue Cloud; Signature Tune. 2.0, I.B.C. Good-night Melody and Close Down.

**FLENSBURG.**—See Hamburg.

**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, 1,220 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News. 12.35 to 1.30, See Langenberg. 2.30, Weather Report. 2.40, Time and Economic Notes. 3.0 to 5.35, See Stuttgart. 5.35, Talk by Rudolf Dillmann: German Types. 5.50, Weather and Programme Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Topical Talk. 7.10, First Monday Concert of the Frankfurt Orchestral Society, relayed from the Saalbau. The Frankfurt Symphony Orchestra, conducted by Hans Rosbaud. Soloists: Karin Brauzell (Contralto). Symphony in E Flat, No. 39 (Haydn); Aria from La Cenerentola (Rossini); Four Songs with Orchestral Accompaniment (Brahms): (a) O Tod, wie bitter bist du, (b) Wenn ich mit Menschen und mit Engelszungen redete, (c) Der Mond steht über dem Berge, (d) Meine Liebe ist grün; Symphony No. 2 in D, Op. 73 (Brahms). 9.0, Time and News. 9.20, See Stuttgart. 9.30, Local News. 9.45, Light Music. 10.0, Programme from Budapest. 11.0, See Langenberg. 12 Midnight, Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

406 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hannover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m., Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Die Hermannsschlacht—a German Drama (Christian Dietrich Grabbe, arranged for Radio). 8.0, Ballad Concert by the Station Choir and Soloists: Normannenzug—for Soloists and Male Voice Choir (Max Bruch); Herr Oint (Loewe); Mixed Choir: Die Glocken zu Speyer (Loewe); Ballad based on Variations on a Norwegian Folk Melody (Grieg). Two Pieces for Male Voice Choir: (a) Schön Torö, (b) Ung Ole (Grieg); Bass: Baritone Solo, Fiddler Lång (Mattiesen); Es war einmal ein König—Ballad for Mixed Choir and Soloists (Otto Walling). 9.0, News. 9.20 (from Kiel), Orchestral concert, conducted by Hans Döring: March, Zigeunerleben (Osceit); Selection from Preciosa (Weber); Serenade (Kark); Overture, Poet and Peasant (Suppé); Waltz, Marienkrieger (Strauss); Selection from Der Feldprediger (Müllbeker); Rosenstunde (Lindsay-Thiemer); Waltz, Was der Wald erzählt (Zimmer); Was Blumen träumen (Translatour); Intermezzo Tanzelfchen (Kauler); March, Deutschlands Ruhm (Schroder).

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—10.30 a.m., Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Il signore Brusolino (Rossini); Selection from Le Villi (Puccini); Overture, Le cheval de bronze (Auber); Eine Walzer Route (Hildebrandt); Two Pieces (Schmalstich): (a) Der Eremit, (b) Die launische Yvette; Selection from The Circus Princess (Kálmán); March, Grenzmarklänge (Schmidt). 12.15 to 1.30 p.m., Landscape in Music—Gramophone Concert: Scene by the Stream from the Symphony No. 6 in F (Beethoven); Two Pieces from Le Fontane di Roma (Respighi); Die Moldau (Smetana); Siegfried's Rhine Journey from The Ring of the Gods (Wagner); Summer Night on the River (Delius); In the Steppes of Central Asia (Borodin); In a Chinese Temple Garden (Krtelhey). In the interval at 12.20 and 1.0, News. 1.40, Talk on Handicrafts for Girls. 2.0, Market Prices. 2.30, Talk on Engineering. 3.0, Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Anacreon (Cherubini); Selection from Othello (Verdi); Suite, Tanzbilder (Köhler); Kavalier-Walzer (Nedbal); Japanese Suite (Yoshitomo); Overture to an Opera (Lincke); Selection from Das Pensement (Suppé). In the interval at 3.50, Book Review. 4.40, Concert of Chamber Music: Quintet in B flat for Flute, Oboe, Clarinet, Horn and Bassoon (Haydn); Quintet in E flat for Piano, Flute, Oboe, Clarinet, Horn and Bassoon (Mozart). 5.15, Market Prices. 5.25 (from Danzig), Talk: The Dan-

zig Fish Market. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, News and Weather. 7.5, The Political Song—a Discussion. 7.25, Zither Recital. 8.0, One Act Plays. 9.0, News. 9.20, Elementary English Lesson.

**HILVERSUM**

1,013 kc/s, 296.1 metres (7 kW. up to 5.40 p.m.), and 20 kW. from 5.40 p.m.—Programme of the General Broadcasting Company (A.V.R.O.) 11.40 a.m., Time Signal. 11.41, Concert by the Wireless Orchestra, conducted by Nico Treep: Overture, Martha (Flotow); Second Suite from L'Arlesienne (Bizet); Réve (d'Ambrosio); Aubade (d'Ambrosio); Persian Scene (Rust); Interlude of Gramophone Records; Selection from The Barber of Seville (Rossini); Melody (Rubinstein); Song without Words (Tchaikovsky); Waltz, Gold and Silver (Lehár); Hungarian Dances Nos. 5 and 6 (Brahms); Interlude of Gramophone Records; Selection from A Kiss in Spring (Kálmán); Im Prater blühen wieder die Bäume (Stolz); Glow-Worm Idyll (Lincke); March, Per aspera ad astra (Ürbach). 1.55 p.m., Interval. 2.10, Song and Piano forte Recital by Edith Walden and Chris Veelo: Aria, Alma del core (Caldara); Canzonetta (Pasquino); Aria from The Magic Flute (Mozart); Song: To Sylvia (Schubert); Song: Zuleika (Schubert); Piano forte Sonata, Op. 31, No. 3 (Beethoven); Songs: (a) Le Colibri (Chausson), (b) Ma poupée chérie (de Séverac), (c) Bal des fleurs (Jongen), (d) To Dreamland (Zagjijn), (e) Cecilia (Voo-moen). (f) The Young Year (Mortelmann); Piano forte Solos: (a) Choses du soir (Grovelez), (b) Chanson d'anctère (Grovelez). 3.10, Gramophone Music. 3.40, Cornelius Cotelbar and his Orchestra, relayed from the Carlton Hotel, Amsterdam. 4.10, Talk with Gramophone Illustrations. 5.10, Popular Music by Hans Schindler and his Orchestra. 6.40, Talk. 7.10, Piano forte and Violin Sonata in C minor, Op. 45 (Grieg) played by Henriette Bosman and Francis Koenig. 7.40, Time, Weather and News. 7.40, Part Relay of the Revue, O bedoel je dat, from the Theatre Carré, Amsterdam. 8.55, Gramophone Music. 9.10, Concert by the Wireless Orchestra, conducted by Nico Treep: Overture, Rund um die Liebe (O. Strauss); Selection from The Merry Peasant (Fall); Chinese Story-tellers (Dreyer); Piece (Moret); Interlude of gramophone Records; Hungarian Waltz Rhapsody (Lindsay-Thiemer); Humoresque (Dvorak); Liebesfreud (Kreisler); Nautical Moments (Winter); Waiting (Ancliffe); March Medley (Clere). 10.40, News. 10.50, Gramophone Music. 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. until 3.40 p.m. Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—Programme of the Christian Radio Society (N.C.R.V.)—11.40 a.m., Police Notes. 11.55, Gramophone Music. 12.10 p.m., Organ Recital by Jan Zwart: Two Chorals (Zwart); Prelude and Fugue (Bach); Variations (Böhm); Pastorale, Recitative and Choral (Karg-Elert); Fantasia on Sacred Songs (Zwart); Evocation à la Chapelle Sixtine (Liszt); Scherzo (Vierne); Finale from Psalm No. 99 (Zwart). 1.40, Broadcast for Schools. 2.15, Gramophone Music. 2.25, Gastronomic Talk. 2.55, Dressmaking Lesson. 3.25, Interval. 3.40, Bible Reading with Songs and Organ Solos. 4.40, Concert by the Hartvelt Trio: Concerto No. 4 (Rameau); Sonata in G Minor (Purcell); Largo in E Minor (Leclair); Concerto Royal No. 4 (Couperin); Sonata in F (Handel); Gramophone Records; Trio, Op. 1, No. 3 (Beethoven). 6.10, Answers to Correspondents. 6.40, Police Notes. 6.55, Religious News. 7.10, Answers to Correspondents (contd.). 7.40, Concert by the Arnhem Orchestra, conducted by Jaap Spanderman. Soloist: Mme. v. d. Rosière-v. Emmerick (Contralto). Overture, Euryanthe (Weber); Songs (Mahler): (a) Ich bin der Welt abhanden gekommen, (b) Um Mitternacht; In the Steppes of Central Asia (Borodin); Symphonic Poem, Romeo and Juliet (Tchaikovsky); Two Arias from Samson and Delilah (Saint-Saëns); Dance of the Sylphs, Dance of the Fireflies and Hungarian March from The Damnation of Faust (Berlioz); Les Préludes (Liszt). In the interval at 8.40, Talk, and at 9.40 (approx.), Press Review. 10.10, Gramophone Music. 11.10 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—11.0 a.m., Concert by the Station Orchestra, conducted by Werner Göhrce: Overture, The Water Carrier (Cherubini); Ballet Music from Faust

(Gounod); Cavatina (Raff); Selection from Hansel and Gretel (Humperdick); Rose mousse (Bosc); Blumenfestler (Blon); Selection from Eva (Lehár). 12.15 p.m., See Frankfurt. 12.25, News. 12.35, Gramophone Records of Marches and Dances: Homage March (Wagner); Third Movement from the Fifth Symphony (Tchaikovsky); March and Dance from Prince Igor (Borodin); March from Sigurd Jorsalfar (Grieg); Symphonic Dance (Grieg); Slav March (Tchaikovsky); Dance (Debussy); Scherzo and March from The Love for the Three Oranges (Prokofiev). 1.30, Meat Market Prices. 2.0, Talk: A Visit to the Annette von Droste Hülshoff Museum in Münster. 2.30, Exchange. 2.50, Political Announcements. 3.0 to 5.35, See Stuttgart. 5.35, Agricultural Talk. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0 to 9.20, See Frankfurt. 9.20, See Stuttgart. 9.30, News. 9.45, See Frankfurt. 10.0, Programme from Budapest. 11.0, Classical Music on Gramophone Records: Symphony No. 7 in A (Beethoven); Suite in B Minor, No. 2 (Bach). 12 Midnight, Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 369.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.5 a.m., Robert Schumann Chamber Music. 12.15 p.m., News. 12.30, Concert of Opera Music on Gramophone Records: Prelude and Prologue to I Pagliacci (Leoncavallo); Song from Tiedland (d'Albert); Aria from Carmen (Bizet); Song from The Hermit's Bell (Maillart); Duets from Undine (Lortzing); Aria from Don Giovanni (Mozart); Song from The Flying Dutchman (Wagner); Aria from Aida (Verdi); Song: Hab mir's gelobt, ihn lieb zu haben (Richard Strauss); Overture, The Merry Wives of Windsor (Nicolaï). 1.15, News. 1.30, Notes on Art. 1.40, Talk for Women. 2.0, Talk: Treasures of Art in the Home. 2.35, Exchange Rates. 3.0, See Breslau. 4.0, German Classics: Reading from Oktavian. 4.20, Soloist Concert: Kurt Rieger (Baritone) and Emil Klinger (Piano forte). Two Songs (Brahms): (a) Wenn du nur zuwelen lüchelst, (b) Der kuss; Two Songs (Richard Strauss): (a) Du meines Herzens Kronelein, (b) Dei Nacht; Two Movements from the Sonata, Op. 19 (Nicodé); Three Songs (Brahms): (a) Sehnsucht, (b) Die Nachtigall, (c) Unbewegte laue Luft. 4.50, Exchange, Weather and Time. 5.0, Italian Lesson. 5.30, Talk: False Prophets and Marxists, Deceivers of the People. 5.50, Review of the Day's News. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.5, Songs to the Lute. 8.0, Der Tod in Genf (Friedrich Schreyvogel). 9.0, News. 9.15 (approx.), Programme to be announced. 10.0, Concert by the Leipzig Symphony Orchestra, conducted by Hilmar Weber: Selection from Lohengrin (Wagner); Hungarian Rhapsody No. 2 in C Minor (Liszt); Two Lyric Pieces (Grieg): (a) Abend im Hochgebirge, (b) An der Wiege; Ballet Music from Anstijn (Marschner); Waltz, Ein Fest in Valencia (Voigt); Selection from William Tell (Rossini). 11.30 (approx.), Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Gramophone Music. 6.30, News for Listeners Abroad. 7.0, Humorous Programme. 8.30, Time and News, followed by Concert by the Station Orchestra. 10.0 (approx.), Close Down.

**LUXEMBOURG**

252 kc/s, 1,191 metres; 200 kW.—Swiss Evening. 7.0, Gramophone Music: Symphonic Piece, Rugby (Honegger); Pacific 231 (Honegger); Pastorale d'été (Honegger). 7.30, Recitations. 7.40, Song Recital by Marie-Thérèse Grosfils De Cuyper: La chère maison (Jaques-Daleroze); La Chanson à la lune (Jaques-Daleroze); Le Cœur de ma Mère (Jaques-Daleroze); Serenade (Raff); The Rosary (Nevin). 8.0, Concert by the Radio Orchestra, conducted by Henri Pensis: Finlandia (Sibelius); Ständchen (R. Strauss); Chant sans paroles (Tchaikovsky); Suite from Coppélia (Delibes); Slav Dance No. 6 (Dvorak). 8.50, News in French. 9.0, Concert of Waltzes and Marches by the Radio Orchestra, conducted by Henri Pensis. 9.45, News in German. 9.55, Gramophone Music. 10.15, Dance Music on Gramophone Records.

**LOWO**

788 kc/s, 381 metres; 16 kW.—6.5 p.m., Announcements. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 10.5, Gramophone Music. 10.30 (approx.), Close Down.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—6.15 p.m., Radio Journal. 7.30, Gramophone Music. 7.40, Radio Gazette for Lyons

and the South-East. 8.30, Concert of Chamber Music. After the Concert, News.

**MADRID**

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Concert of Light Music. In the interval at 10.45, Radio Notes. 11.35, Sports Notes. 11.45, Light Music. 12 Midnight to 12.30 a.m. (Tuesday), Programme in English by the I.B.C.: Montana Call; Oh, Sailor, behave; Kissing is no Sin; Sweet Hawaiian Dreams; On a little Street in Honolulu; Selection from Congress Dances; March from The Vagabond King; Now I'm in Love. 12.30, I.B.C. Good-night Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Radio Journal and Dance Music. 8.15, Topical Review. 8.30 (approx.), Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Musil. Introductions to Acts II and IV of Carmen (Bizet); Ballet Suite from Kassy; (Delibes); Legend No. 4 from Op. 5 (Dvorak); Johann Strauss Potpourri (Korn gold); Součská (Krtan); Serenade (Kaas); Polka (Sieg); March (Cerny). 3.50, See Prague. 5.5, Nature Talk. 5.15, Talk for Workers. 5.25, See Prague. 5.50, German Transmission: Gramophone Concert. 6.0 See Prague. 6.10, See Brno. 7.25, See Prague. 8.0, See Brno. 9.0, See Prague. 9.15 (approx.), Close Down.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 10 kW.—10.45 a.m., Weather Forecast. 1.4 p.m., Weather Report. 2.0, Bizet Concert 3.0, German Lesson. 3.30, Poland-Literary and Musical Programme. 4.30, Concert by a Society of Amateurs. 5.30, Opera-ta Concert. 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 551 metres; and Nürnberg, 1,256 kc/s, 236 metres.—3.30 p.m., Concert from Coburg 4.15, Sextet Concert: Waltz, Samt um Seide (Ziehrer); A Wedding Day on Troid haugen (Grieg); Prize Song from The Mastersingers (Wagner); Arabesque Nos. 1 and 2 (Debussy). 4.45, Talk: Bruckner and the German Spirit. 5.5, Recital of contemporary Songs by Anton Maria Topit: (Tenor); Minnelied (Hans Hermann); Unkenschung (Schattmann); Two Songs (Fran. Kinzl); (a) Gefängnishof, (b) Worte Hitlers Ein Eiland liegt im Abendgold (Liebau); Two Pictures (Mattausch); Das Glück (Rössler); Sehnsucht (Hans Sachs); Two Songs (Walter Schütt); Als ich dich kamm gesellen, (b) Daheim. 5.25, Reading from General Balbo (F. von Poturzyn). 5.45 Time, Weather, and Market Prices. 6.0 Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Military Band Concert from Coburg. 8.0 Bruckner's Fourth Symphony, relayed from the Odeon. 9.0, Austria. 9.23, Time and News. 10.0, Dance Music. 11.0 (approx.), Close Down.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar 527 kc/s, 574.7 metres; Notodden, 471 kc/s, 442.1 metres; Porsgrund, 662 kc/s, 453 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Concert by the Radio Ensemble 5.0, German Lesson. 5.30, Theatre Review 6.0, Announcements, Weather and News. 6.30 Talk. 7.0, Time Signal. 7.1, Concert by the Bergen Radio Orchestra. Soloists: Dagun Solheim (Piano forte) and Ruth Stabe (Songs). Sonata No. 1, Op. 27 (Beethoven) Humoresque-Bagatelles for Piano forte (Cai Nielsen); Selection, Das Nachtlager i Granada (Kreutzer); Réve angélique (Rubin stein); Kvernslatt (Monrad Johansen); So regn (Trygve Torjussen); Minuet in B Minor (Schubert); Kein Halmlein wächst auf Erde (Bach); Das Rosenband (Schubert); Wandlerten (Brahms); Sylvelin (Sinding) Songs (Grieg): (a) Hoffnung, (b) Solveig' Lied. 8.10, Recitations. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Choral Concert.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m. Dopolavoro Notes, Tourist Talk, Agricoltura Report. Report of the Royal Geographical Society and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Chamber Music Soloists: Paladino (Cello), Giacchino (Piano

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forte) and Cacioppo (Soprano). 'Cello Sonata in A (Beethoven); Songs: (a) Dichterliebe (Schumann), (b) Vergin d'Atene (Cimino); Nocturne in F sharp (Chopin); Songs: (a) Mistica (Tirindelli), (b) Voce e'notte (De Curtis); Sonata in F for 'Cello and Pianoforte (Pizzetti). After the Concert, Gramophone Music. 10.0, Giornale Radio.

PARIS

EFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (preliminary) and 9.26 a.m.—8.45 p.m., Le Journal Parlé. 7.30, Orchestral Concert, conducted by Flament: Orchestral Concert (Ganne); Crépuscule oriental (Fosse); Méharis (Coindreau); Au pas lent des caravanes ('courtioux); Turkish March (Musorgsky); Turkish March (Mozart); In a Steppes of Central Asia (Borodin); In a Persian Market (Ketiljev); Persiane Dance (Guiraud); Arab March (Ganne); Orientale (Sporck); La caravane passe (Letory); Arab Dance (Tchaikovsky); Orientale (Dick); Hindu Dance (Rimsky-Korsakov); Pagode au crépuscule (Flament); Chant Birman (Messager). In the interval at 8.0, News and Talk on Home Affairs. 9.0 (approx.). Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Music: Rhapsody, España (Chabrier); Scherzo (Lalo); Tarantella (Cui). 7.15, Le Journal Parlé. 7.30, The Latest Dance Records. 8.0, Talk on Motors. 8.5, Medical Talk. 8.15, Interval. 8.30, Humorous Programme by Max Régner and his Chansonniers. 9.0, Commentary on a Legal Case. 9.15, Gramophone Concert. 10.30, News.

PARIS

RADIO-PARIS, Call CFF, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture (contd.). 7.45, Gramophone Music. 8.0, Press Review and Weather. 12.0 Noon, Gramophone Concert; Part I: Music by Liszt: Mazepa, Liebestraum. Mephisto-Walzer. Les préludes; Part II: Music of Other Lands: Italy: Neapolitan Songs: (a) Lusinga (de Curtis), (b) O Sole mio (di Capua), (c) Santa Lucia (Mario); Spain, Blanca (Arquelladas); Capercueta (Romero and Flores); Lagarandera (Guerrero); Buleria; Media Granadina; Russia; Chorus of the Black Hussars; Lullaby; Rain; Echo of the Valleys; Popular Ukrainian Song; Swiss-Land, Popular Song; Song of Teclno; Czechoslovakia, Mela Babka; Lital Bucka; England, Dinah; Dream River; I'm gonna Charleston. In the intervals at 1.0, Exchange, News and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.20, Market Prices. 6.30, Agricultural Talk. 6.50, Film Review. 7.0, Book Review. 7.20, Gramophone Music. 7.45, News and Horticultural Talk. 8.0, Le sire de Vergy—Opérette (Terra). In the intervals, 8.30, News, Weather and Sports Notes, at 8.40, Talk by Paul Reboux, and at 9.15, Press Review. 10.0, Gramophone Music. 10.30 (approx.). Close Down.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by WSKX on 48.86 metres and 25.27 metres.—7.0 p.m., Musical Originalities, from New York. 7.30, KDKA Home Forum. 8.0, Programme to be announced. 8.15, Words and Music, from New York. 8.45, Human Values. 9.0, Betty and Bob, from New York. 9.15, Radio Guild, from New York. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, Press News-Reeler. 11.15, Sports Notes by Pat Haley. 11.30, Pittsburgh Spotlights. 11.45 to 3.0 a.m. (Tuesday), New York Relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15, Baby Rose Marie. 12.30, Variety Programme. 1.0, The Nomads. 1.30, Potinich and Perlmutter. 1.45, Red Davis. 2.0, Silver Minstrels. 2.30, Melody Moments. 3.0, Silver Toppers.

PORSGRUND.—See Oslo.

POZNAN

896 kc/s, 335 metres; 1.9 kW.—6.5 p.m., Miscellaneous Items. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 7.0, See Warsaw. 9.30, Time Signal and Sports Notes. 9.40, Talk: Giants and Dwarfs in the Animal Kingdom. 9.45 till Close Down, Programme from Warsaw.

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Moravská-Ostrava. 3.50, Programme for Children in Honour of Czechoslovakia's Liberation, October 28th, 1918: Gramophone Music, Recitations, and Talk. 4.5, Gramophone Music. 4.15, Reading. 4.25, Gramophone Music. 4.35, English Lesson. 4.50, Gramophone Music. 5.5, Agricultural Programme. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission, Programme Announcements, Review of Events, and Topical Talk. 6.0, Time, News, and Weather. 6.10, See Brno. 7.25, Recital of Negro Folk Songs from South America, with Harp and Flute Accompaniment. 8.0, Time Signal. 8.1, Concert by the Station Orchestra, conducted by Brock; Soloist, Zathurecky (Violin). 9.0, Time, Weather,

News, and Sports Notes. 9.15, Talk in German: Journalism in Czechoslovakia. 9.30 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.10 to 6.15 a.m. (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Gramophone Concert of French-Swiss Composers. 12 Noon (from Lausanne), Financial Notes. 12.10 p.m. (from Lausanne), Gramophone Concert. 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0, See Schweizerischer-Landesender (Beromunster). 5.0 (from Lausanne), Concert by the Lausanne Small Station Orchestra, conducted by Moser. 5.55 (from Lausanne), Italian Lesson. 6.20 (from Lausanne), Medical Talk. 6.45 (from Lausanne), Radio Chronicle. 6.59 (from Lausanne), Weather Report. 7.0 (from Lausanne), Violin Recital by André Loew: Extracts from My Country (Smetana); Chanson aboire et à danser (César Artok); Habanera (Ravel); Spanish Dance (Falla-Kriener); Oriental Dance (Granados); Scherzo-Tarantella (Wieniawski). 7.30 (from Lausanne), Inù Song Recital by Blanche Meylan-Schüttel: (a) Les petits bateaux, (b) Gynol, (c) Sonnee les matins, (d) Valse fleurie. 7.50 (from Lausanne), Readings. 8.10 (from Lausanne), Popular Concert by the Radio-Lausanne Small Station Orchestra: Soloist: Dottésio (Siffuse-chanteuse). 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

RIGA

572 kc/s, 525 metres; 15 kW.—6.5 p.m., Harp Recital. 6.30, Sketches and Dialogues. 7.0, News. 7.20, Famous Artists on Gramophone Records. 8.0, Weather and News. 8.15, Sketches and Dialogues, followed by Popular Concert on Gramophone Records. 9.0 (approx.), Close Down.

RJUKAN.—See Oslo.

ROME

Call 1R0, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres, from 7.45 p.m. and 12, 11.80, kc/s, 25.4 metres, from 4.15 p.m.—2.0 Noon, Concert of Opera and Variety Music on Gramophone Records. In the interval at 12.30 p.m., Giornale Radio and Exchange. 1.0 to 1.15 (approx.), Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15, Vocal and Instrumental Concert; Luigi Biondi (Violin), Mario Cavagnis (Tenor), and Virginia Brunetti (Soprano); Violin Solos: (a) Largo (Milk), (b) Capriccio viennois (Kreisler); Tenor Solo: Aria from Lohengrin (Wagner); Duet: Minuet (Beloch); Violin Solos: (a) Andalusian Romance (Sarasate), (b) Moto perpetuo (Ries); Aria and Duet from Carmen (Bizet). 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopelavoro and Tourist Reports. 6.10, Agricultural Notes and Market Prices. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.5, Gramophone Music. 7.30, Giornale Radio and Sports Notes. 7.45, Orchestral Concert, conducted by Culotta. In the interval, Talk. 10.0, Giornale Radio.

SALZBURG.—See Vienna.

SCHENECTADY

(WGY), 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres, and by W2XAD on 19.56 metres.—7.30 p.m., Revolving Stage, from New York. 8.0, Health Hunters. 8.15, Soloist, from New York. 8.30 to 8.45, Woman's Radio Review, from New York. 12.45 a.m. (Tuesday), Stock Reports. 1.0, News of the Day; Poetry and Historical Items. 1.30 to 4.0, New York Relay. 1.30, Floyd Gibbons. 2.0, Popular Programme. 2.30, Ship of Joy. 3.0, Contented Programme. 3.30, Jules Lande, Troubadour of the Violin. 4.0, Programme Résumé.

SCHWEIZERISCHER LANDESENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.10 to 6.5 a.m. (from Berne), Gymnastics. 11.0 (from Basle), Gramophone Music. 11.29, Time Signal from Neuchâtel Observatory. Weather and News. 11.40 (from Basle), Gramophone Music. 12.25 p.m. (from Basle), Time, Weather, and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Basle), Programme for Women. 3.0 (from Basle), Gramophone Concert. 4.0 (from Basle), Concert by the Kremono Orchestra. 5.0 (from Basle), Programme for Children. 5.30 (from Zürich), Talk on the Tenth Anniversary of the Turkish Republic. 6.0, Time and Weather. 6.5 (from Zürich), Swiss Songs on Gramophone Records. 6.20 (from Zürich), English

Lesson. 6.50 (from Zürich), Concert by the Radio Orchestra. 8.0, Weather and News. 8.10 (from Zürich), Madlee—An Old German Song Cycle for Bass-Baritone, Choir and Orchestra (Ernst Kunz). 9.30 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Östersund, 389 kc/s, 770 metres, and Sundsvall, 554 kc/s, 542 metres.—12 Noon, Broadcast for Schools. 4.5 p.m., Accordion Music. 4.40 (from Göteborg), Microphone Report. 4.35, Gramophone Music. 5.45, Elementary German Lesson. 6.30, Talk: Heredity. 7.0, Soloist Concert and Reading. 8.15, Talk, relayed from Uppsala, 662 kc/s, 453.2 metres. 9.0, Concert of Light Music. 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Variety Music on Gramophone Records. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Opera Music on Gramophone Records. 2.0, Interval. 5.0, Orchestral Concert, conducted by Roskan. March, Guignol en oguette (Sali); Waltz, Capricieuse (Ronar); Overture, Gillette de Narbonne (Audran); Andante dramatique (Dyck); Selection from Il Trovatore (Verdi); Pianoforte Solo: Nocturne from Corcico (Ganne); Waltz, Friedenspalm (Jos. Strauss); Fête au hameau (Gillet); March, Uncle Sammy (Holzmann). 6.0, Film Review. 6.15, Reading. 6.30, Dance Music on Gramophone Records. Whistling Belle of Barcelona; That's Somerset; Moonlight; When you were; To Lye a Little String; Thoughts of You; Why Shouldn't I?; Old Spanish Love: The Little Old Church; Down Beside: Moon for Sale; We're all Alone. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.20, Concert by the Station Orchestra, conducted by Maurice de Villers and Soloists. Roskan (Celilo) and Melle Kuffmann (Harp). Symphonies (Nabokov); 'Cello Concerto (Saint-Saëns); Prelude to Penelope (Fauré); Harp and Orchestra: Concert Piece (Pierné); L'éclair et Mélisande (Fauré). 10.0 in interval at 9.30, Press Review. 10.30 (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.35 p.m., See Langenberg. 1.30 to 2.0, Interval. 2.0 (from Mannheim), Pianoforte Sonata in B Flat Minor (Chopin), played by Otto Voss. 2.30, The Riesengebirge—Programme arranged by Richter. 3.0, Concert by the Station Orchestra, conducted by Gustav Görlich; Soloists: Georg Völker (Flute) and Artur Fais (Guitar); Overture, Il giuramento (Mercadante); Pieces for Flute and Guitar: (a) March (Call) (b) Minuet (Hunte), (c) Andante (Küttner); Rusticella (Cortopassi); Selection from Rigoletto (Verdi); Allegro (Giuliani); Andantino (Giuliani); Minuet (Diabelli); March from Bocaccio (Suppé); Prelude to Eva (Lehár); Waltz from Die Landstreicher (Ziehrer); Old Viennese Guitar Music: Russdorf-Marsch (Lorenz). 5.0, French Lesson. 5.20 (from Karlsruhe), Talk: A Glimpse into Nature's Laboratory. 5.35, Tales for Old Soldiers. 5.50, Time, Market Prices and Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0 to 8.0, See Frankfurt. 9.0, See Munich. 9.20, Talk: You must know... 9.30, See Frankfurt. 9.50, Local News. 10.0, Programme from Budapest. 11.0, See Langenberg. 12 Midnight, Close Down.

SUNDSVALL.—See Stockholm.

TOULOUSE

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Chansonnettes. 6.30, Accordion Music. 6.35, Operetta Music: Selection from The Dollar Princess (Fall); Waltz from La Teresina (O. Straus); Selection from The Merry Widow (Lehár). 6.45, Sound Film Music. 7.0, Hawaiian Guitar Music. 7.15, News, Racing Results and Market Prices. 7.30, Selection from Sylvia—Ballet (Delibes). 7.45, Spanish Songs. 8.0, Military Music. 8.15, Songs from Opera: Air from Hérodiade (Massenet); O Nuit d'amour, from Messaline (de Lara); Aria from Parsifal (Wagner); Duet from Le Roi d'Ys (Lalo). 8.30, Orchestral Concert: Selection from The Land of Smiles (Lehár); La Housarde (Ganne); Le dervier Sommeil de la Vierge (Massenet); Overture, Nakiris Hochzeit (Lincke); Air (Siede); Le Cerisier (Albret). 9.0, Extracts from Le Jongleur de Notre Dame—Opera (Massenet). 9.30, Orchestral Concert with Songs. 10.0, Argentine Music. 10.15, North African News. 10.30, Concert for Listeners in Morocco: Mignonnette (Frimi); Idylle passionnée (Razigade); Two Guitars (Horlick); Die Schmiede im

Walde (Michaelis); Air from Pas sur la bouche (Yvain); Melody from Le Coeur et la Main (Leococ); Song from The Chocolate Soldier (O. Straus); March from Nina Rosa (Romberg). 11.0, Request Music. 11.15, Dance Music. 12 Midnight, News, Weather and Announcements. 12.5 a.m. (Tuesday), Viennese Music. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

TRONDHEIM.—See Oslo.

TURIN

273.7 metres; 7 kW. Relayed by Milan, 966 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres. 4.10 p.m., Concert of Balalaika Music, relayed from the Cabari. 5.0 to 5.5, Weather. 5.40, Giornale Radio. Dopelavoro Announcements and Gramophone Music. 6.10, Agricultural Notes and Wheat Market Reports. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio and Weather. 7.15, Sponsored Concert. 8.15, A One-Act Play. 8.45, Concert of Chamber Music. 9.30, Giornale Radio on Gramophone Records. 10.0, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15 a.m., Religious Information in Italian. 7.0 to 7.15 p.m., Religious Information in Italian.

VIENNA

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 882 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m., Concert by the Wiener Symphoniker, conducted by Holzer. Soloist: Jaro Schlipf (Violin). March, Grazer Bummier (Stülpe); Comedy Overture, Hokus-Pokus (Leuschner); Waltz-Barcarolle (Waldteufel); Selection from La Bohème (Puccini); Slumber Song (Schrecker) Hungarian Dance (Brahms); Song, Sei ruhig mein Herz (Rochlitzler); Serenade for Violin (Webinger); March, Unser Wien (Kastner); Intermezzo, Liebesosen (Donath); Waltz, Wiener Kinder (Jos. Strauss); Song, Morgen ist wieder Sonnenschein (Sieczynski); Overture to a Revue (Lincke); Waltz, Gräse von der Donaustadt (Dolph-Heckel); Caprice, Wild Rosemary (Godfrey); Selection from Das Fürstentum (Lehár). In the interval at 12 Noon, Time, Weather, News, Exchange and Programme Announcements. 2.0 p.m., Time, Weather and Exchange. 2.20, Talk: Light Athletics for Women. 2.30, Gymnastics for Children. 2.55, Little-known Opera Music on Gramophone Records. 3.30, Talk for Young People. 3.55, Talk: Deaf Musicians. 4.20, Recital on Two Pianofortes: Variations on a Theme of Schubert (Mittler); Arab Suite (Takacz). 4.55, Theatre Review. 5.15, Books and Publications in Connection with the week's Talks. 5.20, Elementary English Lesson. 5.50, Mass in E flat (Schubert) by the Hofmusikapelle, conducted by Luz, and the Soloists. 6.50, Time, Weather and Programme Announcements. 7.0, Topical Programme. 7.15, Reading. 7.45, That is Love—Radio Potpourri (Riedinger) by the Choir of the Volksoper, and the Wiener symphoniker, conducted by Holzer, the Franz Fox Jazz Band and Soloists. 9.15, News, Weather and Exchange. 9.30, Gramophone Music, followed by Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church. Craew. 11.5, Dance Music. 11.30, Radio Journal. 11.35, Weather Report. 11.38, Dance Music (contd.). 12 Noon, Interval. 2.30 p.m., Economic Notes. 2.40, Traffic Report. 2.45, Aviation Report and Anti-Gas Drill. 2.55, Song Recital. 3.10, Romanian Music on Gramophone Records. 3.40, French Lesson. 3.55, Double-bass Recital. 4.25, Song Recital relayed from Poznan, 896 kc/s (335 metres). 4.50, Answers to Agricultural Correspondence. 5.0, Talk: Poland To-day. 5.20, Light Music. 6.5, Miscellaneous Items. 6.25, Musical Programme. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, La Traviata—Opera (Verdi) on Gramophone Records. In an interval, Talk: Economy. 9.0, Sports Notes. 9.10, Dance Music relayed from the Café Zimianska. 10.0, Aviation Weather Report and Police Notes. 10.5, Dance Music relay (contd.).

WILNO

533 kc/s, 563 metres; 16 kW.—6.20 p.m., Miscellaneous Announcements. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 7.0, Quintet—Opera. 8.0, Sports Talk. 8.10, I Pingiacci—Opera Two Acts (Leoncavallo) on Gramophone Records. 9.30, Dance Music from Warsaw.

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—4.0 to 5.30 p.m., Trio Concert. 6.30, Review of Books. 6.45, Announcements. 7.15, Beethoven Symphonies on Gramophone Records. 8.30, Song Recital by Olga Jerotic (Soprano). 8.45, Dance Music. 9.0, News, Weather and Programme Announcements. 9.15, Dance Music. 10.0 (approx.), Close Down.

ZURICH.—See Schweizerischer Landesender.

## ALGIERS

824 kc/s, 364 metres; 13 kW.—7.20 p.m., Light Music. 7.55, News. 8.0, Time and Lottery Results. 8.10, Trio (Mozart) for Piano, Clarinet, and Viola. 8.30, News. 8.35, Guitar Recital by André Segovia: Conrante (Bach); Allegretto from the Sonata in A (Torreba); Tremolo Study (Tarrega); Fandaguillo (Turina); Fugue (Bach); Prelude and Allemande (Bach). 9.0, Variety Concert of Eastern Music. In an interval at 9.30, News. 9.55, News.

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations, and Gramophone Concert. 6.0, Programme for Children. 6.40, News. 7.0, Gaelic Reading. 7.15, Recital of John Casey's Poetry by Gabriel Fallon. 7.30, Time Signal. 7.31, Concert by the Station Orchestra. 8.0, Concert, relayed from the Town Hall, Waterford. 9.0, Talk by Padraic Gregory: The Catholic Heritage in English Literature. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Outdoor Girl Concert. Deep Water (Schwartz); Willow Weep for me (Ronell); Why don't your Lips belong to me (Rotter); We're all alone (Sievler). 9.45, Concert of Dance Music. Dancing Butterfly (Petkere); Shuffle off to Buffalo (Dubin); Moonstruck (Coslow); Don't be late in the Morning (Le Clerq). 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Overture, Figaro (Mozart); Bearerolle from the Tales of Hoffmann (Offenbach); Tello Solo: Harlequinade (Squire); Racing Commentary; Liebesleid (Kreiser); Selection from Lilac Time (Schubert-Berté); Autumn (Chaminade); Auguro March (Franco). 10.30, I.B.C. Goodnight Melody, followed by News and Weather. 10.40, Gaelic Programme. 11.0 (approx.), Close Down.

## BARCELONA

EAJI, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert. Selection from Don Giovanni (Mozart); Abendlied (Schumann); Berceuse de Jocelyn (Godard); Fantasia zingaresca (Scotti); Prelude, Op. 28, No. 17 (Chopin); Selection from The Barber of Seville (Rossini). 7.0, Request Gramophone Records. 7.30, Exchange and Talk. 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather and Messages to Seamen. 9.30, La Falc (The Seylich). Musical Play in Two Acts (Blancafort). In the Interval at 11.0, News.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—3.30, Quintet Concert. 3.55 (approx.) to 5.35, See Rome. 5.35, News in Albanian. 5.45 till Close Down. See Rome.

BASEL.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—6.0 p.m., Recitations. 6.30, Folk Songs on Gramophone Records. 7.0, Alexandre Tcherepnin in a Pianoforte Recital of his own Works. 8.0, Russian Song Recital. 8.30, A Radio Play. 9.10, Time and News, followed by Dance Music from the Auto Club.

## BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—11.5 a.m., Gramophone Concert. 11.55, Time Signal. 12.45 p.m., News. 1.0, Gramophone Concert. 2.0, Talk for Young People: Enlarging Photographs. 2.30, Weather and Exchange. 2.45, Reading from the Works of Gustav Frenssen. 3.0, See Langenberg. 4.0, Talks for Country Women. 4.20, Song Recital. 5.0, Poems. 5.5, Dr. Dietrich, the Nazi Press Chief, reads from his book: Mit Hitler an die Macht. 5.25, Political Press Review. 5.45, Weather and Announcements. 6.0, Transmission for all German Stations: Concert by the Augmented Station Orchestra, conducted by Edwin Lindner: The Brandenburg Concerto No. 3 for String Orchestra (Bach); Symphony in C Minor (Brahms). 7.0, Talk by Herr Grüsser: Geneva and World Economics. 7.20, Cabaret Programme. 8.0, In a Gramophone Shop. 9.0, News. 9.25, Monthly Review of World Politics. 9.45, Weather. 10.0, Programme from Breslau. 11.0 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—6.0 p.m., Transmission for all German Stations, relayed from Berlin (Deutschlandssender). 7.0, See Berlin (Deutschlandssender). 7.20, Lottery Announcements. 7.25, Love—a Sequence of Radio Pictures. 8.15, Quintet in A, Op. 146 (Max Regner) for Clarinet and String Quartet. 9.0, News. 9.20, See Hamburg. In the interval from 10.0 to 10.5, Talk: The Stage and the Cinema. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.50, News, Racing and Lottery Results. 8.0, Talk on Wine. 8.15, News. 8.30, See Paris (Eiffel Tower).

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—5.25 p.m., Gramophone Music. 5.55, Talk for Housewives. 6.0, See Prague. 10.0 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—3.0 p.m., Concert from the Haus Oberschlesien, Gleiwitz. 4.30, Market Prices, followed by Reading. 5.0, Talk: The Trades of Görlitz past and present. 5.25, Talk: Luther and his struggle against the Papacy. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandssender). 7.0, See Berlin (Deutschlandssender). 7.25, See Munich. 7.45, The Germans of the Volga Districts—their Songs and their Sufferings—Concert by the Station Orchestra, conducted by Rudolf Mirbt and Ernst Prade. Soloists: Käthe Heibig (Soprano) and Herbert Heidrich (Tenor). 8.45, Dialogue: Germans in the Black Sea Districts. 9.10, Time and News. 9.35, Political Press Review. 9.55, Light Music and Dance Music from the Kaffee Vaterland. 11.0 (approx.), Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—6.30 p.m., Concert of Schraummel Music. 7.0, Orchestral Concert. 7.40, Gramophone Music. 7.55, See Prague. 10.0 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans: Alleluia (Handel); Meditation (Bach-Gounod); Prelude, No. 39 (Massenet); Melody in F (Rubinstein); Marche solennelle (Tchaikovsky). 12.30 p.m., Pianoforte Recital by Mlle. Annie Felix: Die Spinnerin (Mendelssohn); Romance in D (Schumann); Capriccio (Brahms); Danse (Debussy). 12.45, Orchestral Concert: Occasional March (Handel); Adagio from the Symphony in C (Saint-Saëns); Intermezzo (Mascagni); Liebestraum (Liszt). 1.0, Le Journal Parlé. 1.10, Sacred Music on Gramophone Records: 5.0, Religious Programme; Addresses, Songs and Items by a Verse-Speaking Choir. 6.5, Talk. 6.15, Extracts from King David (Honegger). 6.30, Concert by the Small Station Orchestra, conducted by Leemans: Joyeuse Marche (Chabrier); Birthday Serenade (Lincke); Humoresque (Vreuls); Au son des cloches (Popy); Entracte (Messager); Gothic March (Casadesus); Ständchen (R. Strauss); Jovialités (Gabriel-Marie); Melody (Filipucci). 7.15, Film Review. 7.30, Talk for Women and Art Notes. 8.0, Concert by the Station Orchestra, conducted by Kumps: Fanfare d'honneur (Moulaert); Appels pour un tournoi de chevalerie (Moulaert); Impressions d'Italie (Charpentier); Death and Transfiguration (R. Strauss); La valse (Ravel). 8.45, Religious Address. 9.0, François Rasse Concert by the Station Symphony Orchestra, conducted by John Kumps; Soloist: Mme. Claudine-Marie Bonus (Songs), with the Composer at the Pianoforte: Introductory Talk; Symphonic Poem, Douleur; Lyric Poem for Soprano and Orchestra; Symphonic Poem, Joie; Songs: (a) La première rose, (b) Les enfants, (c) Possession. 9.55, Christus Vincit (Liszt). 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish. 12 Noon, Gramophone Concert. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans: Two-Step; Viva España (Speyer); Suite, At the Circus (Armandola); Serenata dell' Usignolo (Sadun); Eysler Potpourri (Hruba); Gramophone Records; Dizzy Fingers (Confrey); Tango (Wechmar); Neapolitan Song, Marechiaro (Tosti); One-Step (Magidson and Stepl). 5.0, Concert by the Radio Orchestra, conducted by Walpot: March, Semper fidelis (Souza); Rose mousse (Bosc); Vibraphone Solos: (a) Waltz, Vibraphone (Löhrl), (b) Serenade (Löhrl); Joseph Strauss Potpourri (Fährba-h); Zigeunerweisen (Sarasate); Neapolitan March (Baldi). 5.45, Programme for Children. 6.30, Gramophone Music. 7.0, Hawaiian Guitar Music. 7.15, Talk: The Aims and Significance of the Youth Movement. 7.30, Tourist Talk. 8.0, Concert by the Radio Orchestra, conducted by Walpot; Soloists: Julia Belloy Van Troyen (Songs) and Jiel van Schoeland (Recitations and Songs); Einheitslied (Eysler); Rhapsody in Blue (Gershwin); War Songs (Donlicz); Jazz Divertissement (Brusselmanns); Chevauchée fantasque (Brenta); Song (Suls-Walpot); Ballet of the Sylphs. From the Damnation of Faust (Berlioz); Songs: (a) Traumeris, (b) Vergeblische ständchen (Brahms), (c) Songs My Mother taught me (Dvorák); La Paloma (Yradier); Songs: (a) Mijn vrijer is een Kerelken (Broeck), (b) Van 't masscurken (Hulle-

broeck), (c) Waimes en Trientje (Benoit); Waltz from The Count of Luxembourg (Lehar). In the interval, Talk. 10.0, Le Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert of Variety Music by the Motoi Orchestra. In an interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Gramophone Music. 6.40, Talk. 7.0, Song Recital. 7.20, Symphony Concert by the Station Orchestra, conducted by Perlea: Leonora Overture No. 3 (Beethoven); Concerto in D for Two Piano-fortes (Bach); Symphony No. 4 in D Minor (Schumann). In an interval at 8.0, Talk. 8.45, Radio Journal.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 5.45 p.m. till Close Down.—4.0 p.m., Concert by the Pali Pertis Cigány Band. 5.15, French Lesson. 5.45, Gramophone Concert. 6.25, Radio Play. 8.25, Sports Notes and News. 8.40, Concert by the Melles String Quartet: String Quartet in G (Borodin); String Quartet in F (Mozart). 9.40, Weather. 9.45 (approx.), Cigány Music. 10.0, Song Recital by Szentimihályi: Aria from Le Foudre (Puccini); Hungarian Song; Aria (Rachmaninov); Di te (Tirindelli); Hungarian Songs.

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time and Chimes from the Town Hall. 11.5 to 1.0 p.m., String Ensemble Concert, relayed from the Ritz Restaurant. 2.0, Concert by Mogens Hansens Instrumental Ensemble; Soloist, Rigmor Post (Songs): March, The Girls of America (Duganne); Serenade (Levermann); Selection from The Pearl Fishers (Bizet); Serenade (Halvorsen); Babilage (Bossi); Pièce en forme de Habanera (Ravel); Slav Dance in G minor (Dvorák); Songs; Overture, The Mikado (Sullivan); Selection from Die Fäshingstee (Kálmán); Melody (Nielsen); Gavotte (Kovarovic); Minuet from the Military Symphony (Haydn); Marche parisienne (Ganne). 4.0, Programme for Children. 4.30, Exchange and Fish Market Prices. 4.45, Talk. 5.15, German Lesson for Beginners. 5.45, Weather Forecast and announcements. 6.0, News. 6.15, Time Signal. 6.30, Talk: Danish Craftsman. 7.0, Chimes from the Town Hall. 7.5, Sonata for Violin and Pianoforte, Op. 21 (Gade). 7.25, The Ship—Radio Play (Petter Tutein). 8.0, Bizet Concert by the Radio Orchestra, conducted by Emil Reesen: Extracts from (a) Carmen, and (b) L'Arlesienne. 8.45, Readings. 9.5, News. 9.20, Concert of Operetta Music by the Station Orchestra, conducted by Emil Reesen: Overture, Casanova (Lincke); Selection from Light Cavalry (Suppé); Waltz from Die sieben Schwaben (Müllöcker); Selection from Ivanhoe (Sullivan); Waltz from Die geschiedene Frau (Fall); Selection from Bitter Sweet (Coward). 10.5, Dance Music, relayed from the Nimb Restaurant. In the interval at 11.0, Time and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

## CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.20 p.m., Miscellaneous Items and News. 6.25, See Warsaw. In the interval at 6.40, Programme Announcements, and at 9.0, Sports Notes. 10.30 (approx.), Close Down.

DANZIG.—See Heisberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. till 12 Noon, Programme in English by the I.B.C. 11.0, Happy Hour. Part I—Musical Comedy Memories: Signature Tune; Selection from The Merry Widow (Lehar); No No Nanette (Youmans); Selection from The Gipsy Princess (Kálmán); India, Love Call from Rose Marie (Friml); My Hero, from The Chocolate Soldier (Oscar Straus); Selection from The Quaker Girl (Monckton); Waltz from A Waltz Dream (Straus); Musical Comedy Switch (arr. Hall). Part II—Dance Music: I've found the right girl; Then the Moon came out; In Memory of you; Mademoiselle; When my little Pomeranian; Let the World go drifting by; I always keep my girl out late; Trouble in paradise; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.30, Nursery Corner. 5.0, Balalaika Concert for Torquay and Exeter Listeners: Signature Tune; The Night by the Sea; Moment musical (Schubert); Balalaika Solo: Russian Potpourri; Moonlight; Mazurka (Wienawsky); Troika and a Lady (Andreiev); The Red Sarafan (arr. Leontiev); Faune Waltz (arr. Andreiev); Caprice, Air de Ballet

(Andreiev); Shining Moon (Traditional). 5.30, Orchestral Concert for Plymouth and Devonport Listeners: Snacks in Bars (Egerer); Chinatown, my Chinatown (Schwartz); Irish Song Medley (arr. Griffith); Xylophone Solo, Goldfishes (Kroeger); In the Night (Tate); Vienna, Vienna (Foss); Pianoforte Solo: Butterflies in the Rain (Myers); The Clatter of the Clogs (Flynn); Signature Tune. 6.0, Programme in French. 10.0 till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune, The Bells of Normandy; Trouble in Paradise (Wever); Ding Dong Ding (Hargreaves); Egypt (Wallace); A Girl like Nina (Hammerstein); Sundown in a little green Hollow (Whiting); Old Man Harlen (Vallee); They all do the rumba (Steininger); Sing another line (Carson); Let the world go drifting by; Aloha Oe; Hold your Man; With you here and me here; Spanish Sweetheart; 'Twixt the Devil and the Deep Blue Sea; Mademoiselle; I'll show you off; Signature Tune. 11.0, Tunes from the Talkies: Signature Tune, Sittin' in the Dark; Selection from Splinters (Gibbons); How do you do Mr. Brown (Abraham); One little Drink; Pianoforte Solo: Selection from A Bedtime Story; What more can I ask (Noble); The Whip (Stohtart); Let me give my happiness to you (Posford); Selection from Love me tonight; Signature Tune. 11.30, Concert by the International Broadcasting Company (Ireland), Ltd.: Signature Tune, Come back to Erin; Fantasia on Melodies of Johann Strauss; My Dream (Waldteufel); Bandonian Solo: March, Father Rhine (Porschmann); Woodland Peace (Favilla); Amoureux (Berger); Once on the Rhine (Ostermann); Irish National March (Brase); Blossoms from Mozart's Garden; Signature Tune, Come back to Erin. 12.5 a.m. (Wednesday), I.B.C. News Bulletin in English. 12.10 (approx.), Club Concert for Calne and Avebury Listeners: Signature Tune, The Chum Song; Under my Umbrella (Meyer); My woman (Crosby); And so I married the Girl (Stept); Honey-suckle Rose (Waller); Sylvia (Scollard); Oh Johanna (Lawrence); From me to you (Andre); Under a Blanket of Blue (Synes); Down in the Valley (Hartington); Happy Ending (Parr-Davies); It's Sunday down in Caroline (Gordon); Twelfth Street Rag (Bowman); Let's all be happy together (Leslie); Signature Tune. 1.0, Dance Music: Signature Tune, The Bells of Normandy; Chansonette (Friml); Don't blame me (Fields); Whistling under the Moon (Hargreaves); Five Fifteen (Hall); Cornflowers and Poppies (Waldteufel); You're an old smoothie (Whiting); Lover's Lane (Miller); Happy as the day is long (Koehler); Dance pretty Lady (Oscar Straus); Drifting down the Shalimar (Moll); I've got to pass your house (Brown); Then the Moon came out; My Moonlight Madonna; Two Buck Tim; My Kingdom for a Smile from you; My! Oh My!; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

## FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel; and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News. 12.35 to 1.30, Concert of Operetta Potpourris, by the Station Orchestra, conducted by Dr. Reinhold Merten. 2.30, Weather Report. 2.40, Time and Exchange. 3.0 to 5.0, See Langenberg. 5.0, Italian Lesson. 5.20, Talk: What we can learn from the Australian Industrial Crisis. 5.35, Talk: Humanism under the Dritte Reich. 5.50, Weather, News, Exchange, and Programme Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandssender). 7.0, See Berlin (Deutschlandssender). 7.20 to 9.0, See Stuttgart. 9.0, Time and News. 9.20, See Stuttgart. 9.30, Local News. 9.40 (approx.) to 11.0, See Langenberg. 11.0 (also on Zeesen, 31.38 metres). Talk on Dürer's Picture, The Four Apostles. 12 Midnight, Close Down.

FREDRIKSSTAD.—See Oslo.

FREIBURG.—See Stuttgart.

GENEVA.—See Radio-Suisse Romande.

GENOA.—See Turin.

GLEIWITZ.—See Breslau.

GÖTEBORG.—See Stockholm.

GRAZ.—See Vienna.

HAMAR.—See Oslo.

## HAMBURG

806 kc/s, 372 metres; 15 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,592 kc/s, 232.2 metres.—6.0 p.m., Transmission for all German Stations, relayed from Berlin (Deutschlandssender). 7.0, See Berlin (Deutschlandssender). 7.25, See Munich. 7.40, Nettelstedt—A Radio Play (Hermann Schulz). 8.30 (from Bremen), Country Idylls—Concert by the Bremer Stadtinsikanen: Overture, Der Kuhreigen (Kienzl); Waltz, Die Schwalben (Joh. Strauss); Ochsenmuett (Haydn); Froehlichzeit (Bell); Im wogenden Aehrenfeld (Drammann); Maskenball im Gänsestall (Kohler); Trautes Dämmerstündchen (Koh-

OCT. 24th **TUESDAY** continued

ler). 9.0, News. 9.20, Concert by the Philharmonic Orchestra, conducted by Jose Elenschnitz; Soloist, Valentin Grimm (Clarinet); Carnival Overture (Dvorak); Clarinet Solos: (a) First Movement from the Clarinet Concerto (Weber); Larghetto in D Minor (Grimm); Selection from Im Reiche des Pan (Graener); Waltz (Busoni); Suite, Caucasian Sketches (Ippolitov-Ivanov); Overture, Mignon (Thomas); Norwegian Bridal Procession (Grieg); Rhapsody on Swedish Folk Melodies (Lindberg); Waltz-Intermezzo (Michael); Waltz, Seid umschlungen Millionen (Joh. Strauss).

**HANOVER.**—See Hamburg.

**HEILSBURG**  
1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—10.30 a.m., Concert by the Small Station Orchestra, conducted by Eugen Wilcken; Overture in D (Schubert); Selection from Der Wildschütz (Lortzing); Waltz, Deutsche Grusse (Jos. Strauss); Two Russian Dances (Bullerian); Rhapsodie Fantasia (Urban); Suite, Doruröselien (Kienz); Selection from Wie ist im Mai (Kollo). 12.5 p.m., Gramophone Concert: Allegro from the Solo per il Flauto No. 122 (Frederick the Great); Largo from the Second Concerto (Frederick the Great); Cello Solos: (a) Melody (Gluck), (b) Adagio from the Concerto in A Minor (Schumann); Spanish Rhapsody (Liszt); Organ Solos: (a) Arioso in B (Handel), (b) Abendlied (Schumann); Danza delle streghe (Paganini); Waltz in D (Schubert); Minuet in E flat (Haydn); Duets for Piccolo: (a) Melody (Bousquet), (b) Die beiden kleinen Kinken (Kling); Viola d'amore Solo: Love Song and Serenade. In the intervals at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office, with Gramophone Records. 2.0, Market Prices and Exchange. 2.20, Talk on To-day's Fashions. 2.30, Programme for Children. 3.0, Concert by the Small Station Orchestra, conducted by Eugen Wilcken; Overture, Romeo and Juliet (Bellini); Suite from Sylvia (Delibes); Liebeswalzer (Moszkovsky); Selection from Friedemann Bach (Graener); Overture, Light Cavalry (Suppé). 4.0, German Chamber Music by the Königsberg String Trio: Songs (Siegmund von Hausegger) from German Poems for Voice, Viola and Pianoforte: (a) Liebesklänge, (b) Der Falke, (c) Liebeslied; Serenade for String Trio in G (Halm); Songs (Josef Haas): (a) Du und ich, (b) Du bist die Macht, (c) August, (d) Gute Nacht; Sonata in B flat for String Trio (Halm). 4.45, A Discussion on Traffic Accidents. 5.0, Concert by the Small Station Orchestra, conducted by Eugen Wilcken; Overture, Lachendes Leben (Kust); Waltz, Sommerabend an der Nordsee (Döring); Memories of Johann Strauss (Lindemann); Overture, Hokus-Pokus (Leuschner). In the interval at 5.15, Market Prices. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.25, See Munich. 7.45, Recital of Spanish Guitar Music by Prof. Miguel Llobet: Andantino (Sor); Prelude (Sor); Etude (Sor); Suite (Vise); Andante cantabile (Anquado); Two Mexican Songs (Ponce); Two Catalonian Songs (Llobet); Prelude (Tarrega); Allambra (Tarrega). 8.30, Concert of Light Music. 9.0, News and Sports Notes.

**HILVERSUM**  
1,013 kc/s, 296.1 metres; 7 kW up to 5.40 p.m., and 20 kW from 5.40 p.m. Programme of the General Broadcasting Company (N.V.R.O.).—11.40 a.m., Time Signal. 11.41, Concert by the Wireless Orchestra, conducted by Nico Treep; Overture in Italian Style (Schubert); Selection from Samson and Delilah (Saint-Saëns); Prelude and Clair de Lune (Massenet); Ballet Music from Ondine (Lortzing); Waltz, Pomona (Waldteufel); Melody (Dreyer); A little Flirtation (Armada); Selection from The Merry Widow (Lehar); Spring in Japan (Jesse); In the enchanted Forest (Gaugberger); A fête à Aranjuez (Demessan); Porta hungarica (Morena). 1.55 p.m., Interval. 2.10, Concert (cont'd.): Indian Suite (Liljeng); Tarantella (Rossini); Selection from Fedora (Giordano). 2.40, Fashion Talk. 3.40, Song Recital by Annie Hermes. 4.10, Concert by a Children's Choir. 4.40, Programme for Children. 5.10, Talk. 5.40, Gramophone Music. 6.10, Talk. 6.40, Gramophone Music. 7.10, English Lesson. 7.40, Time, Weather, and News. 7.45, Popular Concert by Hans Schindler and his Orchestra. 9.10, A Play. 9.55, Gramophone Music. 10.40, News. 10.50, Hungarian Music by the Baloch Gypsy Band, relayed from The Hague. 11.10, Dance Music from the Central Hotel, The Hague. 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**  
160 kc/s, 1,875 metres; 7 kW. until 3.40 p.m. Transmitted from Kootwijk, on 50 kW., from 3.40 p.m. Programme of the Catholic Radio Society (K.R.O.).—11.55 a.m., Concert by the Vienna Station Octet. 12.40 p.m., Gramophone Music. 12.55, Concert (cont'd.): 1.25, Interval. 1.40, Talk for Women. 2.40, Concert by the Vienna Station Octet. 3.40, Orchestral Concert conducted by Gerritsen; Overture, Nell Gwynn (German); Ballet russe (Ligini); Valse-triste (Sibelius); Selection from Samson and Delilah (Saint-Saëns); Selection from The Prophet (Meyerbeer). 4.30, Gramophone Music. 4.50, Concert (cont'd.): Overture, The Force of Destiny (Verdi); Selection from Mamon Leseaut (Puccini); Festival Overture

(Lassner); Selection from Czar and Carpenter (Lortzing); Selection from The Flying Dutchman (Wagner); Homage March (Liszt). In the interval at 5.10, Talk. 6.20, Lesson in Esperanto. 6.40, Police Announcements. 6.55, Gramophone Music. 7.5, Theological Talk. 7.25, Talk. 7.40, Concert by the K.R.O. Boys. 8.10, News. 8.15, Concert, relayed from Budel; The Orchestra, conducted by Helvert, a Boys' Choir, and Soloists: Hymn (Sileher); Overture, Tancred (Rossini); Address by the Mayor of Budel, M. van Hout; Four Sacred Songs; Air from St. Paul (Mendelssohn); Moeders liedje (Schmitzler); Air from The Force of Destiny (Verdi); Alma March (Stranwen). 9.10, Concert by the K.R.O. Choir, conducted by Vermeulen: Ecce quomodo moritur (Handel); Landa Sion Salvatorem (Koop). 9.20, The Musical Crown—Radio Play. 9.45, Choral Concert (cont'd.): Songs (Andriessen): (a) Song, (b) Heerlijke terwe, (c) De wicdsters, and (d) Liedrens leet. 9.55, Concert by the K.R.O. Boys (cont'd.). 11.0, Gramophone Music. 11.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**  
1,205 kc/s, 249 metres; 6.8 kW.—8.0 p.m., Amusement Guide, Financial Notes, Racing Results and News. 8.10, Agricultural Report. 8.25, Radio Concert. 8.45, News and Weather. 9.0, Radio Concert (cont'd.).

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LAHTI**  
167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—4.0 p.m., Violin Recital. 4.25, Talk. 5.15, Talk. 5.50, Merikanto Song Recital by Marja Kuutti. 6.0, Talk. 6.30, Concert by the Station

phone Records. 1.15, News. 1.40, Talk: Volcanoes under the Ice. 2.0, Programme for Young People: Learning to Fly. 2.35, Exchange Rates. 3.0, Concert by the Leipzig Symphony Orchestra conducted by Theodor Blumer: German Dance (Reuter); Four Contredanses (Mozart); Waltz, Frühlingszauber (Blumer); Hungarian Dances, Nos. 17-21 (Brahms); Two Pieces (Wittenbecher): (a) Slow Waltz, (b) Tango; Der Tanz in der Dorfschenke (Liszt). 4.0, Books we are Waiting for: Das letzte Gesicht (Friedrich Griese). 4.20, Organ Recital. 4.50, Exchange. Weather and Time. 5.0, Lyrics by Max Mcll. 5.10, Chamber Music on Popular Instruments. 5.50, Review of the Day's News. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.25, See Munich. 7.45, Two Radio Pictures (Horst Lehmann and Fritz Sehandl). 8.25, Quartet in C Minor, Op. 51, No. 1 (Brahms) by the Berker Quartet. 9.0, News. 9.40, Talk: Progress made in Medical Science. 10.0, Programme to be announced. 11.0 (approx.), Close Down.

**LJUBLJANA**  
522 kc/s, 574 metres; 7 kW.—6.0 p.m., French Lesson. 6.30, Educational Talk. 7.0, Variety Programme. 8.45, Time, News and Dance Music. 9.30 to 10.0, Programme in English by the I.B.C.: International Broadcasting Club Concert: Why be so kind to me? We all wanna know why; In a Shanty in Old Shanty Town; This is my Love Song; Taboo, Taboo; I don't want to go to bed; He's got a Wife and Family at Home; There was a poor Musician. 10.0 (approx.), Close Down.

**LUXEMBOURG**  
252 kc/s, 1,191 metres; 200 kW.—Belgian Evening. 7.0, Gramophone Records: Quintet in F Minor (César Franck) by Alfred Cortot and the International String Quartet. 7.40,



THE PRAGUE STUDIO ORCHESTRA is noted for its interpretations of modern Czech compositions, though it can give a good account of itself with classical and light music. It can be heard almost daily.

Orchestra, conducted by Linko. Soloist: Komaroff (Pianoforte); Symphony No. 1 in D (Gumarpoulos); Orientale (Cui); Pianoforte Concerto in B minor (Tchaikovsky); Förste mode (Grieg); Zorahaida (Svendson). 7.45, News in Finnish. 8.0, News in Swedish.

**LANGENBERG**  
635 kc/s, 473 metres; 60 kW.—11.0 a.m., From Southern Spheres—Gramophone Concert. 12.15 p.m., See Frankfurt. 12.25, News. 12.35, See Frankfurt. 1.30, Talk on Economics. 1.50, Chamber Music. 2.5, Programme for Young People. 2.30, Exchange. 2.50, Political Announcements. 3.0, Vocal and Instrumental Concert. 4.0, Chamber Music by the Peter Quartet: Quartet in F (Haydn); Italian Serenade in G (Wolf); Quartet in A Minor, Op. 29 (Schubert). 5.0 to 5.35, See Frankfurt. 5.35, Talk: The Aims of the Nordic Society. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.20 to 9.0, See Stuttgart. 9.0, See Frankfurt. 9.20, See Stuttgart. 9.40, Gramophone Music. 10.0, Old German Guild Comedies. 11.0, See Frankfurt. 12 Midnight, Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**  
769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—12.30 p.m., Concert of Popular Music on Gramo-

phone Records. 1.15, News. 1.40, Talk: Volcanoes under the Ice. 2.0, Programme for Young People: Learning to Fly. 2.35, Exchange Rates. 3.0, Concert by the Leipzig Symphony Orchestra conducted by Theodor Blumer: German Dance (Reuter); Four Contredanses (Mozart); Waltz, Frühlingszauber (Blumer); Hungarian Dances, Nos. 17-21 (Brahms); Two Pieces (Wittenbecher): (a) Slow Waltz, (b) Tango; Der Tanz in der Dorfschenke (Liszt). 4.0, Books we are Waiting for: Das letzte Gesicht (Friedrich Griese). 4.20, Organ Recital. 4.50, Exchange. Weather and Time. 5.0, Lyrics by Max Mcll. 5.10, Chamber Music on Popular Instruments. 5.50, Review of the Day's News. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.25, See Munich. 7.45, Two Radio Pictures (Horst Lehmann and Fritz Sehandl). 8.25, Quartet in C Minor, Op. 51, No. 1 (Brahms) by the Berker Quartet. 9.0, News. 9.40, Talk: Progress made in Medical Science. 10.0, Programme to be announced. 11.0 (approx.), Close Down.

**MADRID**  
EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Radio Journal and Request Gramophone Records. 7.30, Talk by Joaquin España Cantos and Gramophone Records (cont'd.). 8.30 to 9.15, Interval. 9.15, English Lesson. 9.30, Chimes, Time and Topical Review. 9.45 (approx.). A Musical Comedy conducted by Alvarez Cantos. 11.45, Topical Review. 12.0 Midnight, Chimes. 1.0 to 2.0 a.m. (Wednesday), Programme in English by the I.B.C.; Popular Music: Stay on the Right side of the Road (Bloom); Wild Goose Chase (Gifford); Danza de Cosacos; Tony's Wife (Lane); Someone stole Gabriel's Horn (Washington); La Précieuse (Couperin); Waltzing in a Dream (Crosby); We belong together (Hammerstein); Let's try again (Newman); Climbing up the Golden Stairs (Heiser); Isn't it Heavenly (Meyer); Selection from "Congress Dances" (Heymann); Let him live (Kahal); Reflections in the Water (Loeb); Marta; I've told every little star (Hammerstein); Down in the Valley (Harrington). 2.0, I.B.C. Goodnight Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**  
1,137 kc/s, 263.8 metres; 11 kW.—6.0 to 10.0 p.m., See Prague. 10.0 (approx.), Close Down.

**MOSCOW**  
TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather Forecast. 1.45 p.m., Weather Report. 2.0, Song Recital by Anatole Dolivo. 3.0, English Lesson. 3.30, Vera Inzer reads from her own Works. 4.30, Programme for Young People. 5.30, Liszt Concert, conducted by Georg Sebastian. 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Programme Announcements. 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**  
563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.5 p.m., Radio Report from Neustadt. 3.30, Orchestral Concert, conducted by Erich Kloss. 4.45, Talk: The Guilds—an early Form of Social Union. 5.5, Der Jenaische Wein- und Bierrufer—a Humorous Musical Play about Student Life in Jena (Johann Nikolaus Bach). 5.25, Dialogue: The Sterilisation of the Unfit. 5.45, Time and Market Prices. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.25, Monthly Review of World Politics. 7.45, Concert of Light Music by the Station Orchestra, conducted by Winter. 8.35, Radio Report from Coburg. 9.0, Time and News.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**  
277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Popular Concert. 5.0, Programme for Women. 5.45, Guitar Music. 6.0, Announcements, Weather and News. 6.30, English Lesson. 7.0, Time Signal. 7.1, Concert by the Station Orchestra, conducted by Kramm: Soloist; Dorothea Brans (Pianoforte); Concerto grosso in G Minor for Two Violins, Cello, Pianoforte, and String Orchestra (Corelli); Concerto in D Minor for Pianoforte and Orchestra (Mozart); Lo Couvent sur l'eau (Casella). 8.0, Programme of Recitations and Songs. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Quartet, No. 1, Op. 20 (Wilhelm Ramsöe), for Wind Instruments.

**OSTERSUND.**—See Stockholm.

**PALERMO**  
558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopplavoro Notes, Tourist Talk, Agricultural Report, and Giornale Radio. 7.20, Gramophone Music. In an interval at 7.30, Time and Announcements. 7.45, L'occasione fa il ladro—Opera in Two Acts (Rossini), followed by Emiral—Opera in One Act (Bruno Barilli). In the intervals, Talk and Announcements. After the Programme, Giornale Radio.

**PARIS**  
EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals).—5.45 p.m., Le Journal Paris. 8.30, Hippolyte et Aricie—Lyric Drama (Rameau), relayed from the Conservatoire. Soloists: Chorus and Orchestra, conducted by Busser.

**PARIS**  
POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Weber Music on Gramophone Records; Hunting Chorus from Der Freischütz; Invitation to the Waltz. 7.15,

Violin Recital by Edmond Perbal. 8.10, Concert by the Radio Orchestra, conducted by Henri Pénis. Overture, Carnival (Glazunov); Poème élégiaque (Jongen); Moment musical (Schubert); Cavatina (Vreul); Mephistowalzer (Liszt); The Flight of the Bumble Bee (Rimsky-Korsakov). 8.50, News in French. 9.0, Concert by the Radio Orchestra. 9.45, News in German. 9.55, Gramophone Records: Ballet Music from Isoline (Messager); Dances from Marouf (Rabaud). 10.20, Dance Music on Gramophone Records.

**LWOW**  
788 kc/s, 381 metres; 16 kW.—6.15 p.m., Announcements. 6.25, See Warsaw. 10.5, Gramophone Music. 10.30 (approx.), Close Down.

**LYONS**  
LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—6.15 p.m., Radio Journal. 7.30, Gramophone Music. 7.40, Radio Gazette for Lyons and the South-East. 8.30, Hippolyte et Aricie—Opera (Rameau), relayed from Paris. After the Opera, News.

**MADRID**  
ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Concert of Light Music. In the interval at 10.45, Radio Notes. 11.35, Talk. 11.45, Light Music. 12 Midnight to 12.30 a.m. (Wednesday), Programme in English by the I.B.C.: The Wave; Butterflies in the Rain; The Blue Danube; Fiesta; Waltz from The Vagabond King; There's a House on a

OCT. 24th **TUESDAY** continued

Le Journal Parlé. 7.30, New Gramophone Records. 8.0, Legal Talk. 8.5, Talk on the Cinema. 8.30, Concert by the Station Symphony Orchestra: Overture, Der Freischütz (Weber); Agathe's Aria from Der Freischütz (Weber); Siegfried Idyll (Wagner); Variations on a Theme of Haydn (Brahms); Russian Melodies; Scheherazade (Rimsky-Korsakov). In the interval at 9.15, Commentary on a Legal Case. 10.30, News.

**PARIS**

**RADIO-PARIS**, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture. 8.0, Press Review and Weather. 12.0 Noon, Gramophone Concert: Suite algérienne (Saint-Saëns); Arab March; Kala Matianas; Impressions de Danias (Kouguell-Desportes); Oriental Romance (Glazunov); Lalye (Andrianary); Hindu Song (Rimsky-Korsakov); In the Steppes of Central Asia (Borodin); In a Chinese Temple Garden (Ketilbey); Chinese Melodies; Thamar (Balakireff); Cambodian Melodies; Chant des îles Marquises (Cahuet); Chants Tahitiens (Chauvelot). In the intervals at 1.0, Exchange, News and Weather, and at 1.30, Exchange. 2.0, Exchange and Announcements. 3.45, Exchange and Market Prices. 4.30, Elementary English Lesson. 6.20, Market Prices, Weather and Announcements. 6.30, Agricultural Talk. 6.50, Gramophone Music. 7.0, Art Notes. 7.20, Gramophone Music: Selection from Countess Maritza (Kálmán); Chanson (Friml); Valencianes (Christobel); Waltz (Durand); Behos; Overture, Anaerion. 7.45, Review of the Anglo-Saxon Press and Announcements. 8.0, Eine kleine Nachtmusik (Mozart) on Gramophone Records. 8.15, Talk. 8.30, See Paris (Eiffel Tower). In the intervals, News and Talk.

**PITTSBURGH**

**KDKA**, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on 48.86 metres and 25.27 metres.—7.0 p.m., Musical Originalities, from New York. 7.30, KDKA Home Forum. 8.0, Programme to be announced. 8.15, Words and Music, from New York. 8.45, Congress of Clubs. 9.0, Betty and Bob, from New York. 9.15, Meredith Wilson's Orchestra, from New York. 9.30, News and Market Reports. 9.45, Talk, from New York. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News and Piano Classique. 11.30, Pittsburgh Spotlights. 11.45 to 12.30 a.m. (Wednesday), New York Relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15, Marvellous Melodies. 12.30, Rhythmic Kings. 12.45 to 2.30, New York Relay. 12.45, Carney's Dog Stories. 1.0, Crime Clues. 1.30, Adventures in Health. 1.45, Trade and Mark. 2.0, Musical Memories. 2.30, Programme to be announced. 3.0, Pedro Via's Orchestra, from New York.

**PORSGRUND**.—See Oslo.

**POZNAN**

896 kc/s, 335 metres; 1.9 kW.—6.5 p.m., Miscellaneous Items. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45 to 9.0, See Warsaw. 9.0, Time Signal and Sports Notes. 9.10, Dance Music from the Café Esplanade. In the interval at 10.0, See Warsaw. 10.30 (approx.), Close Down.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Smetacek: Dance and Prelude (Foerster); Variations for Harp on a Theme of Mozart (Prochaska); Symphonic Poem, La Forêt enchantée (d'Indy); Overture, A Night in Karstein, Op. 26 (Fibich); Shakespeare Festival March (Smetana). 3.55, Programme for Young People in Honour of National Independence Day. 4.15, Talk for Workers. 4.25, Gramophone Music. 4.35, German Lesson. 4.50, Gramophone Music. 5.5, Agricultural Prices. 5.15, Talk for Workers: Events in Russia. 5.25, News in German. 5.30, German Transmission: Songs by German Composers in Bohemia. 6.0, Time, News and Weather. 6.10, Reading. 6.25, Choral Concert. 6.55, Military Band Concert, conducted by Stolec. 7.55, Introductory Talk to the following Transmission. 8.10, Concert by the Ondricek String Quartet: Barcarolle from the Quartet in D Minor (Suk); Quartet in F, Op. 22 (Tchaikovsky). 9.0, Time, Weather, News, and Sports Notes. 9.15, Gramophone Records. 10.0 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**SOTTENS**, 743 kc/s, 403 metres; 25 kW: and **GENEVA**, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Gramophone Concert of Songs from Sound Films and Popular Songs. 12 Noon p.m. (from Lausanne), Financial Notes. 12.10 p.m. (from Lausanne), Gramophone Concert. 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0 (from Lausanne), Concert. 5.0 (from Lausanne), Talk for Women. 5.30 (from Lausanne), Talk. 5.55 (from Lausanne), German Lesson. 6.20 (from Lausanne), Talk. 6.45 (from Lausanne), Radio Chronicle. 6.59 (from Lausanne),

Weather Report. 7.0 (from Lausanne), Recitations. 7.30, Programme to be announced. 8.30, See Paris (Eiffel Tower).

**REYKJAVIK**

1,200 metres; 21 kW.—8.5 p.m., Musical Programme. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, Chimes and News. 9.30, Reading. 10.0, Pianoforte Recital by Emil Thoroddson, followed by Arias on Gramophone Records.

**RIGA**

572 kc/s, 525 metres; 15 kW.—6.5 p.m., Concert of Opera Music: Overture, William Tell (Rossini); Selection from The Pearl Fishers (Bizet); Ballet Music from Etienne Marcel (Saint-Saëns); Overture, Mignon (Thomas). 7.0, News. 7.20, Aria Recital: Two Arias (Wagner): From (a) Tannhäuser, (b) The Valkyrie; Three Arias (Mozart): (a) Champagne Gallop from Don Giovanni, (b) Serenade from Don Giovanni, (c) Aria from Figaro. 7.40, Concert (contd.): Introduction to Khovanstchina; Selection from The Queen of Spades (Tchaikovsky); Indian Ballet from Lakmé (Delibes); Overture, Alessandro Stradella (Pflow). In the interval at 8.0, Weather. 8.30, Light Music. 9.30 (approx.), Close Down.

**RJUKAN**.—See Oslo.

**ROME**

Call **IRO**, 680 kc/s, 441 metres; 50 kW. Relayed by **Naples**, 941 kc/s, 319 metres; **Milan (Vigentino)**, 662 kc/s, 453.2 metres, from 7.45 p.m., and **2RO**, 11,810 kc/s, 25.4 metres from 4.15 p.m.—12 Noon, Trio Concert, relayed from Turin. In the interval at 12.30 p.m., Giornale Radio and Exchange. 1.0 to 1.15 (approx.), Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15 to 5.0, Orchestral Concert. 5.40 (Naples), Shipping and Sports Notes. 5.45, Morse Signals and Dopolavoro Notes. 6.0, Tourist Report. 6.10, Agricultural Notes and Market Prices. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Sponsored Music. 7.30, Sports Notes. 7.45, Concert. 8.30 (approx.), Literary and Art Notes. 8.45, Soprano Song Recital by Gianna Perera Labia; Alleluia (Mozart); La Pastorella (Rossini); Aria from Lucia di Lammermoor (Donizetti). 9.0, Three Caprices for Violin (Paganini), played by Clara Sardo. 9.15, Gramophone Concert: Overture, La Vestale (Spontini); Tenor Solo and Funeral March from The Dusk of the Gods (Wagner); The Musical-Snuff Box (Liadov); The Flight of the Bumble Bee from Tsar Saltan (Rimsky-Korsakov); Overture, Carnaval romain (Berlioz); Danza esotica (Mascagni). 10.0, Giornale Radio.

**SALZBURG**.—See Vienna.

**SCHENECTADY**

(**WGY**), 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on 31.48 metres, and by **W2XAD** on 19.56 metres.—12.45 a.m. (Wednesday), Stock Reports. 1.0 to 3.30 a.m., New York Relay. 1.0, Blackstone Plantation. 1.30, Wayne King's Orchestra. 2.0, Ben Bernie's Orchestra. 2.30, Popular Programme. 3.0, Lives at Stake. 3.30, Musical Programme from New York, followed by Programme Resumé.

**SCHWEIZERISCHER LANDESENDER**

**BEROMUNSTER**, 653 kc/s, 459 metres; 60 kW.: **Basle**, 1,229 kc/s, 244.1 metres; and **Berne**, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne), Gymnastics. 11.0 (from Zürich), Orchestral Concert. 12.25 p.m. (from Zürich), Time, Weather, and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Zürich), Concert by the Small Station Orchestra. 3.0 (from Lausanne), See **Radio-Suisse Romande**. 5.0 (from Berne), Gramophone Concert. 5.30 (from Berne), Talk on Hunting. 6.0 (from Berne), Time, Weather, and Talk for Schools. 6.20 (from Berne), Talk on Swiss Week. 6.50 (from Berne), Talk on the following Transmission. 7.0 (from Berne), Symphony Concert, arranged by the Berne Musical Society. 9.0 (approx.), Weather, News, and Close Down.

**SOTTENS**.—See **Radio-Suisse Romande**.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relayed by **Boden**, 244 kc/s, 1,229.5 metres; **Göteborg**, 937 kc/s, 322 metres; **Hörby**, 1,166 kc/s, 257 metres; **Motala**, 222.5 kc/s, 1,348 metres; **Ostersund**, 389 kc/s, 770 metres; and **Sundsvall**, 554 kc/s, 542 metres.—1.45 p.m., Broadcast for Schools. 4.5, Programme for Children. 4.30, Talk. 5.0, Gramophone Music. 5.45, Elementary French Lesson. 6.30, Talk: Town Life in Sweden in the Middle Ages. 7.0, Cabaret Programme. 7.40, Literary Review. 8.10, String Quartet in F, Op. 18 (Steinhammer), by the Barkel Quartet. 9.0, Concert: Overture, Ruslan and Ludmilla

(Glinka); Waltz, Dorfkind (Kálmán); Selection from I Pagliacci (Leoncavallo); Canzonetta notturno (Wappler); Tango (Egen-Grothe); Potpourri (Taube); Komm Zigany from Countess Maritza (Kálmán). 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Concert of Light Music. 12 Noon, Orchestral Concert, conducted by Maurice de Villers: Ballet Music from Alceste (Gluck); Symphony in D (Mozart); Overture, Die Weihe des Hauses (Beethoven). 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Lecoq Concert by the Station Orchestra: Overture, Giffolé-Girofla; Selection from La petite mariée; Ballet Music from Les Fantoccini; Selection from Le cœur et la main; Overture, Les cent vierges; Selection from La fille de Madame Angot (Lecoq). 2.0, Interval. 4.45, Talk on the French Colonies: Algeria. 5.0, Orchestral Concert, conducted by Roskam: March, Cordoba (Lozano); Menuet fleuri (Ganne); Pavane (Ganne); Overture, Rip (Planquette); Cello and Pianoforte: Chant du ménestrel (Glazunov); Selection from L'Africaine (Meyerbeer); Ballet Suite (Popy); Waltz (Petras). 6.0, History Talk. 6.15, Topical Talk. 6.30, Song and Pianoforte Recital by Suzanne Roufflage and Max Pagoda. Songs: Six Sonnets de Michel Ange (Lelen); Pianoforte Solo: Two Novellettes (Poulenc); Three Songs from La saison passagère (Dupérier); Pianoforte Solos (Poulenc): (a) Nocturne, (b) Pastorale, (c) Toccata, (d) Hymen; Three Chinese Poems (Roussel): (a) Réponse d'une épouse sage, (b) Amoureux séparés, (c) A un jeune gentilhomme. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results, and Announcements. 8.30, Hippolyte et Aricie—Opera (Rameau), relayed from Paris. 10.30 (approx.), Press Review.

**STUTTGART**

**MUHLACKER**, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg**, 527 kc/s, 570 metres.—12.35 p.m., See Frankfurt. 1.30 to 2.30, Interval. 2.35, Pianoforte Recital. 3.0 to 5.0, See Langenberg. 5.0 to 5.55, See Frankfurt. 5.55, Talk: The History of the Württemberg Army. 5.50, Time, Market Prices and Weather. 6.0, Transmission for all German Stations, relayed from Berlin (**Deutschlandsender**). 7.0, See Berlin (**Deutschlandsender**). 7.20, Unconscious Humour, Programme arranged by Paul Enderling. 7.45, Mozart Programme by the Station Orchestra, conducted by Ferdinand Drost. Part I: Eine Kleine Nachtmusik. Part II: Salzburger Spielzeug—a Musical Sketch after Möller (Gans). Part III: Three German Dances. 8.20, Sources of Industry—Rubber—Radio Sequence (arr. by Karl Köstlin). 9.0, Time and News. 9.20, Talk: You must know... News. 9.40 (approx.) to 11.0, See Langenberg. 11.0, See Frankfurt. 12 Midnight, Close Down.

**SUNDSVALL**.—See Stockholm.

**TOULOUSE**

**RADIOPHONIE DU MIDI**; 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Accordion Music. 6.30, Chansonnettes. 6.45, Operetta Music: Airs from Rainuncho (Fierne) and Barbe bleue (Offenbach). 7.0, Sound-Film Music. 7.15, News, Racing Results, and Market Prices. 7.30, Pianoforte Recital: Mazurka in B Minor, Op. 33, No. 4 (Chopin); Valse romantique (Debussy); Scherzo (Mendelssohn); Liebestraum (Liszt). 7.45, Opera Music: Reverie from The Mastersingers (Wagner); Aria from Don Giovanni (Mozart); Forest Murmurs, from Siegfried (Wagner); Song from Sigurd (Reyer). 8.0, Viennese Music. 8.15, Songs. 8.30, Military Music. 8.45, Operetta Music. 9.0, Bizet Concert: Romance from The Pearl Fishers; Aria from The Fair Maid of Perth; Farandole and March from L'Arlésienne; Overture, Aria, and Entr'acte Music from Carmen. 9.45, Bal-Musette Music. 10.0, Light Music. Selection from Bitter-Sweet (Coward); Airs from The Student Prince (Romberg); Czardas; Troika; Kaschek. 10.15, North African News. 10.30, Concert for Listeners in Morocco: Aria from Tosca (Puccini); Melody from Romeo and Juliet (Gounod); Elats de Rire from Ma non Lescant (Auber); Air from Thérèse (Massenet); Dance of the Seven Veils, from Salomé (R. Strauss); Melody (Granichestaeden); Selection from Les Cent Vierges (Lecoq). 11.0, Opera Music: Selection from Faust (Gounod); Overture, Manfred (Schumann). 11.15, Dance Music. 12.0 Midnight, News, Weather, and Announcements. 12.5 a.m. (Wednesday), Light Music. 12.20, Accordion Music. 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 till Close Down, See Turin.

**TRONDHEIM**.—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan**, 905 kc/s, 331.5 metres; **Genoa**, 969 kc/s, 312.8 metres; and **Florence**, 599 kc/s, 500.8 metres.—4.10 p.m., Dance Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolavoro Announcements, and Gramophone Music. 6.0, Time, Report of the Royal Geographical Society, and Gramophone Music. 6.10, Agricultural Notes and Wheat Market Reports. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio, Sports Notes, and Weather. 7.25, Introductory Talk to the following Transmission. 7.30, Fior di neve—Operetta in Three Acts (Giuseppe Blanc). In the intervals, Talk and Art Notes. After the Operetta, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning), and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15 a.m., Religious Information in English. 7.0 to 7.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by **Graz**, 852 kc/s, 352.1 metres; **Innsbruck**, 1,058 kc/s, 283 metres; **Klagenfurt**, 662 kc/s, 453.2 metres; **Linz**, 1,220 kc/s, 254.9 metres; and **Salzburg**, 1,373 kc/s, 218.5 metres.—11.0 a.m., Concert by the Wiener Symphoniker, conducted by Holzer. 12 Noon, Time, Weather, Exchange and Programme Announcements. 12.10 p.m., Famous Artists on Gramophone Records. 2.0, Time, Weather and Market Prices. 2.20, Talk: Honey, Marmelade and Fruit Syrup. 2.35, Programme for Children. 3.0, Music from Sound Films on Gramophone Records. 3.30, Handwork for Children. 3.55, Talk: The Burgtheater. 4.20, Pianoforte Recital by Margarete Alt: Sonata in C, Op. 1 (Brahms); Polonaise, Op. 75 (Schubert); Mazurka in C Sharp, Minor (Chopin). 4.55, Talk on Aeroplanes: The Rocket. 5.25, Elementary French Lesson. 5.50, Viennese Music by the Tautenhayn Quartet. 6.50, Time, Weather and Programme Announcements. 7.0, Austrian Memorial Programme—Flietsch-Tolmeit, 1917. 8.0, Love Duets from Wagner's Operas. The Volke per Orchestra, conducted by Auerieth. Soloists: Otti Santera (Soprano), Maria Schubert (Soprano), and Karl Ziegler (Tenor): Overture and Duet from Tannhäuser; Duet and Prelude to Act III of Lohengrin; Duet from Tristan and Isolde; Finale of Act I of The Valkyrie; Siegfried's Rhine Journey from The Dusk of the Gods; Duet from Siegfried. In the interval at 9.0 (approx.), News and Weather. 10.0, Announcements. 10.10, Dance Music on Gramophone Records. After the Programme, Announcements.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Folk Music on Gramophone Records. 11.30, Radio Journal. 11.38, Ballet Music on Gramophone Records. 12 Noon, Interval. 2.30 p.m., Economic Notes. 2.40, Light Music and Dance Music by the Gorzynski Orchestra. 3.25, Talk: The Savings-Bank. 3.40, Answers to Correspondence. 3.55, Pianoforte Recital by Kalecki; Sonata in A (Scarlatti); Prelude and Fugue in C sharp (Bach); Three Pieces (Schubert): (a) Barcarolle, (b) Gretchen am Spinnrad, (c) Ständchen; Two Pieces (Liszt): (a) Au bord d'une source, (b) Feux Follets; Etude in D flat (Scriabin); Triana (Albeniz). 4.30, Aria and Song Recital by Wraga (Bass); Arias from (a) Fidelio (Beethoven), (b) Don Juan (Mozart), (c) Figaro (Mozart); Sacred Son (Beethoven); Das Veilchen (Mozart). 4.50, Agricultural Notes. 5.0, Talk: Impressionism, A New Theory of Colour and Light. 5.20, Rameau and Couperin Overture by Trombini-Kazuro (Harpischord), Ochlewski (Violin), and Szalewski (Viola), with Introductory Talk by Mme. A. Simon: Five Pieces from Concerts royaux (Couperin); Fifth Concerto in D minor for Harpsichord, Violin, and Viola (Rameau). 6.5, Miscellaneous Items. 6.25, Topical Talk. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Orchestral Concert of Light Music. In an interval at 8.0, Reading. 9.0, Sports Notes. 9.10, Dance Music, relayed from **Caza**. 10.0, Aviation Weather Report and Police Notes. 10.5, Dance Music (contd.).

**WILNO**

533 kc/s, 563 metres; 16 kW.—6.20 p.m., Miscellaneous Items. 6.40, Programme Announcements. 6.45, See Warsaw. 7.0, Request Gramophone Concert. 7.30, Concert from Warsaw. 9.10, Two Sketches (Mark Twain), arranged for Radio by Halina Hohendingerowna. 9.40, Dance Music from Warsaw.

**ZAGREB**

977 kc/s, 307 metres; 0.75 kW.—4.0 to 5.30 p.m., Concert by the Station Orchestra. 6.45, Announcements. 7.15, Concert by the Station Orchestra. Soloist: Kundic (Mezzo-Soprano). 8.45, Dance Music. 9.0, News, Weather, and Programme Announcements. 9.15, Dance Music (contd.). 10.0 (approx.), Close Down.

**ZURICH**.—See **Schweizerischer Landessender**.

**ATHLONE**

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations, and Gramophone Concert. 6.0, Programme for Children. 6.45, News. 7.0, Gaelic Talk. 7.15, German Lesson. 7.30, Time Signal. 7.31, The Station Orchestra, with H. R. White in a Programme of his own Compositions. 8.0, Baritone Solos by Mat Dunleavy. 8.15, A Sketch by Elizabeth Young and Company. 8.45, Contralto Solos by K. Byrne. 9.0, Concert by the Station Orchestra. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Extracts from Musical Comedies: Nina Rosa Medley; Song: Only a Rose, from The Vagabond King (Friml); Selection from Rose Marie (Friml); You're the Cream in my Coffee, from Hold Everything (de Sylva); Indian Love call from Rose-Marie (Friml); Selection from Waltzes from Vienna (Strauss); Song: Wayside Rose, from Frederica (Lehar); Selection from Bow Bells (Sullivan-Carter). 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Moon Song (Johnson); I've got to sing a Torch Song; Reflections in the Water (Loeb); Racing Commentary; It's within your power (Revel); Butterflies in the Rain (Myers); Sophisticated Lady; Morning, Noon, and Night. 10.30, I.B.C. Good-night Melody, followed by News and Weather. 10.40, Irish Music. 11.0 (approx.), Close Down.

**BARCELONA**

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Selection from Parsifal (Wagner); Melody (Mascheroni); Andante from the Cassation in G (Mozart); Intermezzo (Mignone); Selection from A Masked Ball (Verdi); Clair de lune, from Werther (Massenet); March (Smetana). 7.0, Request Gramophone Records. 7.30, Exchange and Gramophone Records (cont'd). 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices. 9.5, Concert by the Station Orchestra: March, The Phantom Brigade (Myddleton); Selection from Henry VIII (Saint-Saens); Waltz, Volga, Volga (Noack); Gavotte from Armida (Gluck); Melody (Perrey); Solsona (Marraco). 10.0, Guitar Solos by Antoni Francisco Serra. 10.30, Choral and Orchestral Concert, followed by Gramophone Music. In the interval at 11.0, News. 12 Midnight (approx.), Close Down.

**BARI**

1,112 kc/s, 269.8 metres; 20 kW.—12 Noon to 3.30, See Rome. 3.30, Programme for Children. 4.10 to 5.35, See Rome. 5.35, News in Albanian. 5.45 till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

**BELGRADE**

697 kc/s, 430.4 metres; 2.5 kW.—6.0 p.m., Concert by the Station Orchestra. 7.0, See Ljubljana. In the interval at 8.20, Time and News.

**BERLIN**

DEUTSCHLANDSENDER (REICHSEN- DER), 183.5 kc/s, 1,635 metres; 60 kW.—11.5, Gramophone Concert: Frisch gesungen (Slicher); In der Ferne (Slicher); Serenade No. 6 (Mozart); Ach du klarblauer Himmel (Slicher); Folk Song, Liebes-schmerz; Andante from the Trio in C (Brahms); Am Brunnen vor dem Tore (Schubert); Der Gondelfahrer (Schubert); Salome's Dance (Richard Strauss); Folk Song, Vergebliches Ständchen; Die Mairacht; Valse bleue (Margis); Lotus Flowers (Ohlsen). After the Concert, Weather. 11.55, Time Signal. 12 Noon, Interval. 12.45 p.m., News. 1.0, Gramophone Concert (continued); Wedding Scenes (Smetana); Cello Solos: (a) Papillon (Faure); (b) Arlequin (Popper); Soprano Solo: Aria from Oberon (Weber); Sonata in G minor No. 1 for Violin (Bach); Two Songs by the Don Cossack Choir; Sarabande and Partita for Pianoforte (Bach); Baritone Solos: Two Arias from Iphigenia on Tauris (Gluck). 1.45, Programme for Children. 2.30, Weather and Exchange. 2.45, Reading from Dummhaus (Gustav Freussen). 3.0, See Hamburg. 4.0, Dialogue: Spirit and Intellect. 4.20, Orchestral Concert. 5.0, Poems. 5.5, Religious Address and Organ Solos. 5.25, German for Germans. 5.50, Weather and Announcements. 6.0, Transmission for all German Stations relayed from Frankfurt. 7.0, Today's Motto. 7.5, Hochöfen, Essen and Schlote (From Forge and Foundry)—Radio Sequence of Workers' Poems arranged by Helmut Hansen. 8.10, See Breslau. 9.0, News. 9.30, Technical Wireless Talk. 9.45, Weather. 10.0, See Frankfurt.

**BERLIN**

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—3.30 p.m., Orchestral Concert, relayed from the Hotel Esplanade. 4.20, Talk on Hitler. 4.40, Beethoven Song Recital by Elisabeth Harth zur Nieden (Contralto); Kennst du das Land; Ich liebe dich; Freund-soll und leidvoll; Die Trommel gerührt; Der treue Johnie. 4.65, Talk on the 7.5 p.m. Transmission. 5.5, See Berlin (Deutsch-landsender). 5.40, The Funkstunde informs its Listeners. . . 5.45, Topical Talk. 6.0,

**WEDNESDAY**  
OCTOBER THE TWENTY-FIFTH

Transmission for all German Stations, relayed from Frankfurt. 7.5, Von deutscher Seele—Romantic Cantata, Op. 28 (Pfitzner) relayed from the Philharmonie. The Bruno Kittelsch Choir and the Berlin Philharmonie Orchestra, conducted by the Composer. Soloists: Anita Oberländer (Soprano), Maria Peschken (Contralto), Heinz Marten (Tenor) and Fred Drissen (Baritone). 9.0, News. 9.15 (approx.), Dance Music, relayed from the Spreegarten, Treptow. In the interval at 10.0 (approx.), a Radio Report. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

**BORDEAUX-LAFAYETTE**

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.35, News. 7.40, Theatre Review. 7.55, Lottery Results. 8.0, Agricultural Talk. 8.15, News. 8.30, Gramophone Concert. 9.0, Concert by a Symphony Orchestra, and Soloists.

**BRATISLAVA**

1,076 kc/s, 279 metres; 14 kW.—4.55 p.m., Hungarian Transmission: Concert by the Station Orchestra, with Talk. 5.55, Talk for Housewives. 6.0, See Prague. 7.0, Concert by the Station Orchestra, conducted by F. Dyk. 8.25, See Prague. 9.15 (approx.), Close Down.

BREMEN.—See Hamburg.

**BRESLAU**

923 kc/s, 325 metres; 60 kW. Relayed by Clewitz, 1,184 kc/s, 253 metres.—1.10 p.m., Recital of Eichendorff Songs by Gerthy Haindl (Soprano); Two Songs (Schumann): (a) Zwickel, (b) Mondnacht; Abends (Franz); Der Einsiedler (Mattiessen); Two Songs (Hugo Wolf); (a) Erwartung, (b) Verschwiegene Liebe; Sonst (Pfitzner). 1.40, Programme arranged by the Post Office with Gramophone Records. 2.0, Market Prices. 2.15, Talk: Teachers and Scholars. 2.30, Talk for Parents. 3.0, Flute Recital: Andante (Mozart); Third Concert Piece for Flute (Demerssemann). 3.30, Talk. 3.50, Zither Recital: Episode (Schiffel); Gebet auf den Bergen (Otto); Im Banne des Genius—Paraphrase (Grünwald); Intermezzo (Heinrich). 4.20, Market Prices, followed by Talk. 4.40, Concert by the Beuthen Boys' Choir: Russian Evensong (arr. Otto); Steh'n zwei Stern (arr. Kluss); Wiegenlied (arr. Otto); Tragische Geschichte (arr. Zelter); Two Songs (arr. Otto): (a) Das Mühlrad, (b) Aemchenlied; Two Songs (Kluss): (a) Das Lied von den ungarischen Husaren, (b) Hoppsa. 5.25, Talk: The National Socialist Movement. 5.50, Meat Market Prices. 6.0, Transmission for all German Stations, relayed from Frankfurt. 7.0, News. 7.5, See Berlin (Funkstunde). 9.0, See Munich. 9.20, Time and News. 9.45, Light Music and Dance Music from the Haus Metropol. 11.0 (approx.), Close Down.

**BRNO**

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission: News, Songs on Gramophone Records, Talk for Workers and Literary Talk. 6.0, See Prague. 7.0, Gramophone Music with Commentary. 7.35, Tales of the Woods—Recitations and Music by the Station Orchestra. 8.25, Organ Recital. 9.0, See Prague. 9.30 (approx.), Close Down.

**BRUSSELS (No. 1)**

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans: Overture, A Midsummer Night's Dream (Thomas); Piano-forte and String Quartet; Petite Suite (Olsen); Romance (d'Ambrosio); Selection from Les Bavards (Offenbach); Violin Solo: Londonderry Air (Kreisler); Waltz, Je t'aime (Waldteuffel); Ballet Music from Lakmé (Delibes); One-Step, La bouquetière de Séville (Wyn and Langlois). 1.0 p.m., Le Journal Parlé. 1.10, Concert conducted by André Felleman, relayed from the Grand Hotel, Antwerp. 5.0, Dance Music, relayed from the St. Sauveur Palais de Danses. 6.15, Brigg Fair (Delus), on Gramophone Records. 6.30, Gramophone Concert of Hebrew Music, with Commentary. 7.15, Gramophone Concert: Plaisir d'amour (Martini); Variations on a Theme of Mozart (Adam); Overture, Il Seraglio (Mozart). 7.30, Medical Talk. 8.0, Concert by the Radio Orchestra, conducted by Charles Walpot. Soloist: Mme. Marville (Songs); March of the Footballers (Bury); Overture, The Gipsy Baron (Joh. Strauss); Gavotte, Au village (Gillet); Selection from Les dragons de Villars (Maillart); Three Songs: (a) Nous dire adieu (Moretti). (b) La barque d'Yves (Tranchant), (c) Ballet

Suite, La Mascarade (Lacôme). 8.45, Reading of Poems (de Musset, Lamartine, Hugo and Vigny). 9.0, Orchestral Concert (cont'd): Pianoforte Solo: Slav Rhapsody No. 2 (Friedemann); Idylle passionnelle (Razigade); Intermezzo (Siede); Two Songs; Xylophone Solo: Czardas (Monti); Gavotte Idyll (Lincke); In a Persian Market (Ketelbey); Ballet Music from Faust (Gounod). 10.0, Le Journal Parlé.

**BRUSSELS (No. 2)**

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—12 Noon, Orchestral Concert, conducted by André Felleman, relayed from the Grand Hotel, Antwerp: March, King Cotton (Souza); Potpourri (Morena); Two Pieces (Komjati); Popular Dance Airs (Borchert); Violin Solo: Polonaise (Wieniawsky); Operetta Potpourri, Von Wien durch die Welt (Rhuby). 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Le Lieutenant du roi (Titl); Schatzwalzer (Joh. Strauss); Serenade (Löhr); Selection from The Queen of Sheba (Gounod); Pianoforte Solo: Valse caprice (Newland); Characteristic Dance (Kalkman); Selection from The Merry Peasant (Fall); One-Step, I Dragoni (Asobar). 5.0, Concert by the Radio Orchestra, conducted by Charles Walpot: Marche commémorative (Gilson); Overture légère (Luigini); Three Oriental Miniatures (Fischer); Waltz, Ne m'oubliez pas (Waldteuffel); Selection from Tieland (d'Albert); Liedezang (Candael); Petite suite (Chaminade). 6.0, Gramophone Music. 6.15, Talk: The Dykes of Holland. 6.30, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Les cent vierges (Lecroq); Suite, Le parc d'attractions (Biancafort); Serenade, L'amour fervent (Wappaus); Flute Solo: Humoresque (Sarly); Slav Potpourri, Solajanka (Wilke); Two Step, La flor española (Miranda). 7.10, Song Recital by Mme. Malfeyl. 7.30, Le Journal Parlé. 8.0, Swane-Opera in Three Acts (Schoenaker). In the intervals, Recitation and Gramophone Music. After the Opera, Le Journal Parlé.

**BUCHAREST**

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra: March (Souza); Waltz Intermezzo (Translateur); Rocco Suite (Aihout); Selection from The Circus Princess (Kálmán); Crêpeuse orientale (de Michei); Potpourri (Morena); Souvenir (Hebert); Trot de Cavalerie (Rubinstein); Rigaudon (Hartog). In an interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Chamber Music on Gramophone Records. 6.40, Talk. 7.0, Violin and Pianoforte Recital: Sonata in E minor (Veracini); Sonata in E (Bach). 7.30, Talk. 7.45, Song Recital by Richard Tauber on Gramophone Records. 8.15, Cello Recital by Cocea. 8.45, Radio Journal. 9.0, Romanian Music by the Station Orchestra.

**BUDAPEST**

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 6.30 (approx.) till Close Down.—4.30 p.m., Concert by the Concert Orchestra, conducted by Komor. 5.35, Italian Lesson. 5.55, Talk. 6.30, Relay from the Royal Hungarian Opera House. In the interval, News. After the Programme, Concert by the Imre Magyar (Gyagy) Band, relayed from the Hotel Hungaria. 10.0, Talk in French: Hungarian Folk Music, with Gramophone Illustrations. 10.20 (approx.), Close Down.

CASSEL.—See Frankfurt.

**COPENHAGEN**

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall. 11.2, Concert by the Leonard Gyldmark String Ensemble, relayed from the Bellevue Strandhotel. 1.0 p.m., Interval. 2.0, Gramophone Concert of Variety Music. 2.30, Concert by the Radio Orchestra, conducted by Fritz Mahler: Overture, Les dragons de Villars (Maillart); Two Pieces (Joh. Strauss): (a) Waltz, Roses from the South, (b) Perpetuum mobile; Suite from The Fair Maid of Perth (Bizet); Overture, Die schöne Galathee (Suppe); Overture, Lisola disabitata (Haydn); Ballet Music from Idomeneo (Mozart); Waltz, Die Schönbrenner (Lanner); Overture, Heimkehr aus der Fremde (Mendelssohn). In an interval at 3.15, Programme for Children. 4.30, Exchange and Fish Market Prices. 4.45, Agricultural Prices. 5.15, French Lesson. 5.45, Weather. 5.54, Announcements. 6.0, News. 6.15, Time Signal. 6.30, Talk by G. Höst; Australia. 7.0, Time Signal from the Town Hall. 7.1, Pianoforte Sonata No. 4 in E Flat (Mozart), by Folmer Jensen. 7.20, A Visit with the Microphone. 7.50, Concert by the Bel Canto Male Voice Choir, conducted by Anders Rachelew. In an interval at 8.15, Talk on Unemployment. 9.5, News. 9.20,

Concert of German Music by the Radio Chamber Orchestra, conducted by Fritz Mahler: Concerto grosso No. 2 in A (Muffart); Ballet Suite from Alcina (Handel); Piece for Oboe, Strings and Harpsichord (Telmann); Symphony No. 2 in B Flat for Strings and Harpsichord (C. P. E. Bach). 10.0, Dance Music by the Teddy Petersen Band, relayed from the Wivex Restaurant. In an interval at 11.0, Time Signal and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

**CRACOW**

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., The Letter Box. 6.20, Miscellaneous Items. 6.25, See Warsaw. In an interval at 9.0, Sports Notes. 9.10, Talk in Esperanto. 9.25, Light Music, relayed from the Pavilion Restaurant. In an interval at 10.0, News. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

**FECAMP**

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. till 12 Noon, Programme in English by the I.B.C. 11.0, Happy Hour. Part I, Request Concert: Signature Tune; Serenade (Haykens); The Song of Songs (Moya); Live, Laugh and Love; Goodbye (Posti); Selection from The Maid of the Mountains (Fraser-Simson); In a Monastery Garden (Ketelbey); Ah! Sweet Mystery of Life; Cupid's Army (Sievier). Part II, Request Dance Music: Lazybones; Don't blame me; Sweetheart darlin'; I cover the Waterfront; Cabin in the Pines; In a Little Second-hand store; In the Valley of the Moon; The Old Spinning Wheel; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.20, The Nursery Corner. 5.0, Orchestral Concert for Isle of Wight Listeners: Signature Tune; The Night by the Sea; Overture, Morning, Noon and Night (Suppe); Hymn to the Sun (Rimsky-Korsakov); Cœur brisé (Gillet); Love sends a little gift of Busses (Opushaw); The Moon and I, from The Mikado (Sullivan); Le Cygne (Saint-Saens); Dance of the Clowns (Smetana); Roses from the South (Strauss). 5.30, Gramophone Concert for Portsmouth and Southsea Listeners: Hand me down my Walking Cane; The Lion and Albert; I had to go and find another job (Scott); I stopped, I looked, I listened (Grey); The Grass is getting greener all the time (Burke); Reflections in the Water (Loeb); The Birth of the Blues (Henderson); Selection from He Wanted Adventure (Waller); Signature Tune. 6.0, Programme in French. 10.0 till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune. Bells of Normandy; It's not a Secret any more; My Moonlight Madoune; Flor de Cuba; Sing another Line; Don't blame me; I gota right to sing the Blues; Blue Cloud; Ding, Dong, Ding; Oh! Johanna; Lazybones; Wedding of the Dragon Flies; Forever; Sweet dreams, Pretty Lady; Carry me back to Green, Green Pastures; Lover's Land; Made-moiseille; Aloha Oe! Signature Tune. 11.0, Times from the Talkies; Signature Tune; Sittin' in the Dark; Dance, Pretty Lady (O. Straus); Selection from The Big Pond (Fain); Blonde Women (Hollander); Pardon, Madame (Abraham); Come out, Vienna (Herbert and Strauss); I'll stay with you (Woods); I want to cling to Ivy; Selection, The Crooner; Signature Tune. 11.30, Club Concert for Marlborough and Saverack Listeners. Part I, Military Music: Signature Tune; The Chum Song; New Colonial March (Hall); Rose of Tralee (Spencer); Selection of Leslie Stuart's Songs; A Frangosa (Costa); Song of my Heart (McCarthy); Selection from San Toy (Monckton); Highland Fling (Traditional); Sailor's Hornpipe (Traditional); War Time Marching Songs. 12.5 a.m. (Thursday), I.B.C. News Bulletin in English. 12.10 (approx.), Club Concert. Part II: You don't understand (Ellis); Hiawatha's Lullaby (Young); Sweet (Ellis); The Sun has got his Hat on (Butler); This Lovely Rose (Sievier); Signature Tune. 12.30 a.m., Dance Music: I lay me down to Sleep; Won't you stay to Tea? I've found the Right Girl; Hold me; I bring a Song; My Darling; Then the Moon came out; Whistling under the Moon. 1.0, Dance Music: Signature Tune; Bells of Normandy; I'll take an option on you; Wood Violets; Happy as the day is long; Tick, Tock; A Woman should stick to her Man; Avalon; With you here and me here; At the Old Pig and Whistle; Learn to Croon; Dancing Butterfly; Goodnight, but not Goodbye; Reflections in the Water; Isn't it Heavenly? A Girl like Nina; Down in the Valley; I'll show you off; Signature Tune. 2.8, I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35, See Langenberg. 1.30, See Stuttgart. 2.30, Weather Forecast. 2.40, Time and Market Prices. 3.0, Vocal and Instrumental Concert. 5.0 to 5.35, See Langenberg. 5.35, Topical Programme. 5.50, News and Time. 6.0, Transmission for all German Stations; German

OCT. 25th **WEDNESDAY** continued

Dances—a Radio Sequence of Classical Dance Music from Haydn to Strauss by the Station Orchestra, conducted by Hans Rosbaud and Soloists. 7.0, Topical Talk. 7.10. See **Langenberg**. 9.0, Time and News. 9.20. See **Stuttgart**. 9.30, Local News and Weather. 9.45, Light Music. 10.0, Concert of Opera Overtures and Arias: The Station Orchestra conducted by Dr. Rheinhold Merten; Soloist: Max Oswald (Tenor); Overture, Si j'étais Roi (Adam); Aria from Jean de Paris (Boieldieu); Overture, Jean de Paris (Boieldieu); Aria from La Dame blanche (Boieldieu); Overture, Le Maçon (Auber); Cavatina from La Dame blanche (Boieldieu); Aria and Overture from Fra Diavolo (Auber); Aria from Le Maçon (Auber); Overture, La Dame blanche (Boieldieu). 11.0, See **Stuttgart**. 12 Midnight, Close Down.

**FREDRIKSSTAD**.—See **Oslo**.  
**FREIBURG**.—See **Stuttgart**.  
**GENEVA**.—See **Radio-Suisse Romande**.  
**GENOA**.—See **Turin**.  
**GLEIWITZ**.—See **Breslau**.  
**GOTEBERG**.—See **Stockholm**.  
**GRAZ**.—See **Vienna**.  
**HAMAR**.—See **Oslo**.

**HAMBURG**  
806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Plesburg, 1,319 kc/s, 227.4 metres; Hanover, 550 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., Concert of Italian Music by the Small Station Orchestra, conducted by Gerhard Maasz: Wedding March (Bosini); Intermezzo from Romeo and Juliet (Zandonai); Selection from La vedova scaltra (Wolf-Ferrari); Madrigal (Bolzoni); Suite, Rossini (Respighi). 4.0 (from Kiel), August Iwersens—Radio Sequence from the Schleswig Poets' Works, arranged by Klaus Witt. 4.30, Topical Programme. 5.0, Talk by Captain Hans Walther: German Heroes of the U-Boats. 5.20, Humorous Gramophone Records. 5.40, Frankfurt Exchange and Hamburg Market Prices. 5.50, Weather. 6.0, Transmission for all German Stations relayed from **Frankfurt**. 7.0, Political Announcements. 7.10 (from Kiel), Concert by the Kiel Orchestra of Unemployed Musicians, conducted by Hans Döring: Overture, Yelva (Reissiger); Rauteleins Leid from Die versunkene Glocke (Zöllner); Selection from Die Königskinder (Humperdink); Andante from the Symphony in D Minor (Volkmann); Symphonic Poem, Orpheus (Liszt); Ballet Music from King Manfred (Reinecke); Carnival Waltz (Kienzl). 8.30, Reading from the Works of Timm Kröger, with Introductory Talk. 9.0, Time and News. 9.20 (from Hanover), Orchestral Concert, relayed from the 'café Continental'. 10.10 (from Bremen), Concert relayed from the Atlantic Café.  
**HANOVER**.—See **Hamburg**.

**HEILSBURG**  
1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Famous Singers on Gramophone Records. In the interval at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office, with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.20, Hints for the Housewife. 2.30, Programme for Children. 3.0, Concert by the Small Station Orchestra, conducted by Wilcken: March (Siede); Overture, Anne Boleyn (Donizetti); Ballet Music from Czar and Carpenter (Lortzing); Suite campestre (Amadei); Selection from Manon Lescaut (Puccini); Oasis (Wismar); Waltz, Estudiantina (Waldteufel); Selection from Zigeunerprimas (Kálmán). In the interval at 3.50 (approx.), Book Review. 4.50, Programme for Teachers. 5.15, Agricultural Prices. 5.20, Recital on Two Pianos: Sonata in B Flat (Clementi); Andante and Variations in B Flat, Op. 46 (Schumann). 5.50, Weather. 6.0, Transmission for all German Stations, relayed from **Frankfurt**. 7.0, News and Weather. 7.10, The Stream—Radio Play (Max Halbe). 8.20, Dance Music and Light Music by the Small Station Orchestra and the Borscheil Dance Band. In the interval at 9.0, News and Weather. 11.0 (approx.), Close Down.

**HILVERSUM**  
1,013 kc/s, 296.1 metres; 20 kW. 7 kW. up to 5.40 p.m. and 20 kW. from 5.40 p.m.—11.40 a.m. till Close Down, Programme of the Workers' Radio Society (V.A.R.A.). 11.40 a.m., Concert by the Small Station Orchestra, conducted by de Groot: March (Bosini); Hochzeitstreigen (Lincke); In the Heart of the lills (Lee); I'll give the World for you (Zamenick); Gramophone Music: Life in Japan (Higgs); Czardas (Niklas Kemper); Gramophone Music: Chant sans paroles (Tchaikovsky); Selection from The Merry Widow (Lehar); An Old Violin (Fischer); Rève d'amour (Beccie); J'y pense (Drdla); Aubade printanière (Lacombe); Valse triste (Berger); Italian Suite (Kostal). 1.25 p.m., Interval. 1.40, Orchestral Concert, conducted by Wins: March (Holzmann); Etincelles (Waldteufel); Goldkärchens Brautwerbung (Armandola); Three Pieces (Philippi): (a) El tango de amor, (b) Nocturne, (c) Russian Dance; Gramophone Music; Es war einmal ein Zigeuner (Eineg); Slav Dance No. 7 (Dvorák); Love

Eternal (Barbirolli); Puppe und Hampelmann (Armandola); Poet's Dream (Candilo); Serenade (Campolmi); Occhi neri (Campolmi). 2.40, Programme for Children. 5.25, Concert by the V.A.R.A. Orchestra, conducted by de Groot: Polies Bergères (Lincke); Selection from Die Landstreicher (Ziehrer); Nocturne in E flat (Chopin); Polonaise in A (Chopin); By the Blue Hawaiian Waters (Ketelbey). 5.55, Song Recital. 6.10, Concert (contd.); Overture, Light Cavalry (Suppé); Frühling, wie bist du so schön (Lincke); Hindu Song (Rimsky-Korsakov); Torch Dance of the Brides of Kashmir (Rubinstein); Toujours ou jamais (Waldteufel); Overture, Fidelio (Beethoven); Serenade (Volkmann); Selection from The Arabian Nights (Strauss); Selection from Polen Blut (Nedbal). In an interval at 6.40, Talk. 7.40, SOS Announcements and Miscellaneous Items. 7.45, News. 7.55, Concert (contd.): Bal costumé (Rubinstein); Potpourri, Fortissimo (Kalmann). 8.25, Song Recital. 8.40, Symphony Concert relayed from the Queen's Hall, London. 9.10, Concert by the Beuker-Denjis Ensemble. In an interval at 9.25, Organ Recital. 9.55, Concert by De Filierfuiters, conducted by v.d. Horst: Soloist: Charon (Songs); Das muss ein Stück vom Himmel sein (Leymann); So küsst man nur in Wien (Abraham); Mein Liebeslied muss ein Walzer sein (Stolz); Das war herrlich (Benatzky); Let's all sing like the Birdies sing (Evans); Ich lieg' so gern im grünen Gras (Jurnann); Die Dorfmusik (Fryberg). 10.25, Organ Recital (contd.). 10.40, Gramophone Music. 11.40 (approx.), Close Down.

**HOBBY**.—See **Stockholm**.  
**HUIZEN**  
160 kc/s, 1,875 metres; 7 kW. until 3.40 p.m. Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—10.40 a.m. till Close Down, Programme of the Christian Radio Society (N.C.R.V.). 10.40, Pianoforte Recital by Doortmont: Italian Concerto (Bach); Pathetic Sonata (Beethoven); Gramophone Music; Papillons (Schumann); Rhapsody No. 2 (Brahms); Barcarolle (Chopin). 11.40, Police Notes. 11.55, Gramophone Music. 12.10 p.m., Quartet Concert. 1.40, Gramophone Music. 2.40, Talk. 2.55, Concert by a Children's Choir, with Gramophone Interludes. 4.40, Programme for Children. 5.40, Agricultural Talk. 6.10, Programme to be announced. 6.40, Police Notes. 6.55, Religious Report. 7.10, Frisian Programme. 7.40, Concert by the Royal Oratorio Choir and the Concertgebouw Orchestra, conducted by Hubert Cuypers, relayed from the Concertgebouw. Amsterdam: Soloists: Mlle. v.d. Slijs (Soprano), Mlle. Luger (Contralto), v. Tulder (Tenor), Ravelli (Bass), and Herbschleb (Violin); Part I, Le Déluge—Biblical Opera (Saint-Saëns); Part II, L'Enfant Prodigue (Debussy). In the interval at 8.55, News and Gramophone Music. 9.55, Gramophone Music. 10.10 (approx.), Close Down.  
**INNSBRUCK**.—See **Vienna**.

**JUAN LES PINS**  
1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, Financial Notes, Racing Results and News. 8.10, Oceanographic Report. 8.25, Radio Concert. 9.0, News and Weather. 9.15, Radio Concert (contd.).  
**KALUNDBORG**.—See **Copenhagen**.  
**KIEL**.—See **Hamburg**.  
**KLAGENFURT**.—See **Vienna**.  
**KOSICE**.—See **Prague**.

**LANGENBERG**  
635 kc/s, 473 metres; 60 kW.—11.0 a.m., Concert by the Essen Symphony Orchestra, conducted by Anton Nowakowski, relayed from the Saalbau, Essen. March, The Entry of the Gladiators (Fucik); Overture, The Caliph of Bagdad (Boieldieu); Selection from La Traviata (Verdi); Selection from The Merry Widow (Lehar); Selection from The Bird Fancier (Zeller); Overture, The Gipsy Baron (Joh. Strauss); Overture, Fra Diavolo (Auber). 12.15 p.m., Time and News relayed from **Frankfurt**. 12.25, News and Weather. 12.35, Operetta Music on Gramophone Records. 1.30, See **Stuttgart**. 2.30, Exchange and Market Prices. 2.45, Post Office Announcements. 2.50, Political Announcements. 3.0, See **Frankfurt**. 5.0, German for Germans. 5.20, Talk: The Racial Question. 5.35, Recitations in Rhinish Dialect. 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from **Frankfurt**. 7.0, See **Frankfurt**. 7.10, Madame Liselotte—Opera in Three Acts (Ottmar Gerster). 9.0, Time and News, relayed from **Frankfurt**. 9.20, See **Stuttgart**. 9.30, News. 9.40, A Flying Visit. 10.0, See **Frankfurt**. 11.0, See **Stuttgart**. 12 Midnight, Close Down.  
**LAUSANNE**.—See **Radio-Suisse Romande**.

**LEIPZIG**  
769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m.,

Concert: March, Alte Kameradeu (Teike); Overture, Il Guarany (Gomez); Belleville-Walzer (Müllböcker); Pastoral from The Queen of Spades (Tchaikovsky); Deutsches Waldlied (Niemann); Selection from Der Vagabund (Zeller); Ballet Overture (Kremer); Serenade No. 2 (Fuchs); Selection from The Valkyrie (Wagner). In the interval at 12.15 p.m., News. 1.0, Second News. 1.10, Talk on Taxation. 1.30, Talk for Motorists. 2.0, Gramophone Concert. 2.35, Market Prices. 3.0, Programme for Young People. 4.35, Gramophone Music. 4.50, Market Prices, Weather and Time. 5.0, Review of Austrian Books. 5.20, Humorous Reading. 5.40, Talk: Scandinavia's Culture as depicted in her Castles. 6.0, Transmission for all German Stations, relayed from **Frankfurt**. 7.0, The World on Wheels—Programme by Hans Peter Schmiedel. 8.15, Old and New Dances by the Emde Orchestra: March from The Merry Widow (Lehar); Waltz, Wine, Woman and Song (Joh. Strauss); Hahnen-Rheinländer Fétras; Tango (Panzini); Hallo, kleines Fräulein (Lesso-Valerio); Foxtrot, Heut' war ich auf dem Fundbüro (Kollo); Waltz, Roman einer Nacht (Carste); Pasodoble, Bella Venezia (Ellinger); Polka-Mazurka, Silberglockchen (Ramthor); Waltz, Heut' sind wir vernügt (Meisel); Die fixe Donauinse (Lincke); Foxtrot (Montagnini); Tango, Kannst du mir nicht sagen, warum ich glücklich bin (Meissner); Tango (Leonardi); Foxtrot, Sag nicht ja, sag nicht nein (Schmidt-Boelke); Wanderin von Land zu Land (Redl). 9.0, News and Sports Notes. 10.0, Robert Volkmann Memorial Concert by the Leipzig Symphony Orchestra, conducted by Hilmar Weber. Soloist: Christian Kling (Cello). Overture, Richard III; Concerto in A minor for Cello and Orchestra; Serenade in D minor Op. 69 for Strings and Cello; Hungarian Sketches Op. 24; Festival Overture, Op. 50. 11.0 (approx.), Close Down.  
**LINZ**.—See **Vienna**.

**LJUBLJANA**  
522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Talk on Primitive Religion. 6.30, Gramophone Music. 6.45, Talk on the following Transmission. 7.0, Relay of an Opera. In the interval, Time and News. 10.0 (approx.), Close Down.

**LUXEMBOURG**  
252 kc/s, 1,191 metres; 200 kW. Luxembourg Evening.—7.0, Broadcast for Schools, with Songs by a Children's Choir. 7.40, Recital of Luxembourg Songs. 8.10, Concert by the Radio Orchestra, conducted by Henri Pénis: Prologue to I Pagliacci (Leoncavallo); Musical Impressions (Mawet); Caprice italien (Tchaikovsky); Cherry Ripe (Scott). 8.35, News in French. 8.45, See **Radio-Paris**. In the interval at 9.50, News in German. 10.45, Dance Music on Gramophone Records.

**LWOW**  
788 kc/s, 381 metres; 16 kW.—6.5 p.m., Announcements. 6.25, See **Warsaw**. 6.40, Programme Announcements. 6.45, See **Warsaw**. 8.15, Concert from **Poznan**. 9.0, See **Warsaw**. 10.5, Gramophone Music. 10.30 (approx.), Close Down.

**LYONS**  
**LA DOUA**, 644 kc/s, 465.8 metres; 1.5 kW.—6.15 p.m., Radio Journal. 7.30, Gramophone Music. 7.40, Radio Gazette for Lyons and the South-East. 8.30, Variety Concert.

**MADRID**  
**ARANJUEZ (EAQ)**, 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Concert of Light Music. In the interval at 10.45, Radio Notes. 11.40, Light Music. 12 Midnight to 12.30 a.m. (Thursday), Concert by the I.B.C. (Ireland), Ltd.: Signature Tune, Come back to Erin; Louis XIII Song (Kreisl); Sonata in G Sharp (Mozart); Scherzo in E Minor (Mendelssohn); Traum im Wirren (Schumann); Beautiful Nice; The Siege on Monte Carlo; Hawaiian Sunset; Please; Signature Tune, Come back to Erin. 12.30 a.m., I.B.C. Good-night Melody and Close Down.

**MADRID**  
**EAJ7**, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes. Exchange, Announcements, Programme for Women, and Dance Music. 8.15, Topical Review. 8.30 to 9.30, Interval. 9.30, Chimes, Time and Topical Review. 9.45 (approx.), Concert by the Madrid Symphony Orchestra, conducted by Enrique Fernández Arbós: Suite, from Céphale et Procris (Grétry); Prelude and Death of Isolde, from Tristan and Isolde (Wagner); Symphony from the New World (Dvorák); Children's Corner (Debussy); Polo gitano from Las Escenas andaluzas (Bretón); Orgia, from Danzas fantásticas (Turina). 11.45, Topical Review. 12 Midnight, Chimes and Close Down.

**MALMO**.—See **Stockholm**.  
**MILAN**.—See **Turin**.

**MORAVSKA-OSTRAVA**  
1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Plichta: Overture, The Merry Wives of Windsor (Nicolaï); Intermezzo, Gavotte, Waltz and March (Henneberg); Humoresque (Simicek); Selection from Paganini (Lehar); Piece (Smaték); March (Tichy). 3.50, Princess Dandelion—a Marionette Play (Kvapil). 4.35, See **Prague**. 4.45, Talk. 5.0, Talk on Czech Classics. 5.15, See **Prague**. 5.25, Brass Band Concert. 6.0, See **Prague**. 6.10, Reading. 6.25, See **Prague**. 7.0, Variety Concert. 8.25, See **Prague**. 9.15 (approx.), Close Down.

**MOSCOW**  
**TRADES UNION**, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather Forecast. 1.45 p.m., Weather Report. 2.0, Talk: The U.S.S.R. 3.0, German Lesson. 3.30, Literary Programme. 4.30, Talk: Popular Art in U.S.S.R. 5.30, Pushkin in Music—Concert. 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.  
**MOTALA**.—See **Stockholm**.

**MUHLACKER**.—See **Stuttgart**.  
**MUNICH**  
563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Orchestral Concert conducted by Erich Kloss: Overture, Casanova (Lortzing); Three Pieces (Leoncavallo): (a) Melody, (b) Reverie, (c) Sarabande; Dance Scene from Little Ida's Flowers (Klenau); Suite, La Source (Debüss); Two Pieces (de Micheli); Potpourri, Auf Wiederhören (Weninger); Screenade, On Lake Maggiore (Heusser); The Mill (Jensen). 4.45 from Nürnberg, Talk: The German Legion in the Napoleonic Wars. 5.5, Song Recital by Petra Lic-Zapfel (Soprano): Songs (Franz): (a) Du liebes Auge, (b) Wenn ich es nur wüsste, (c) Rosmarin, (d) Ein Stündlein vor dem Tage, (e) Für Musik; Songs (Wolf): (a) Im Frühling, (b) Der Knabe und das Immelein, (c) Das verlassene Mägdlein, (d) Auf einer Wanderung. 5.25, Talk: A Visit to a South-West African Farm. 5.45, Time, Weather and Agricultural Report. 6.0, Transmission for all German Stations relayed from **Frankfurt**. 7.0, Rothenburg—Provincial Programme. 8.0, Munich from Early Morning till Late at Night—Radio Sequence in Six Scenes (Schroder-Justin). 9.0, Austria. 9.20, Time and News. 10.0, Serenade conducted by Erich Kloss. 11.0 (approx.), Close Down.

**NAPLES**.—See **Rome**.  
**NOTODDEN**.—See **Oslo**.

**OSLO**  
277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Popular Concert on Gramophone Records. 5.0, French Lesson. 5.30, Programme for Young People. 6.0, Announcements, Weather and News. 6.30, Talk: The Earth and the Planets. 7.0, Time Signal. 7.1, Concert of Operetta Music by the Station Orchestra, conducted by Kraun. 8.0, Literary Review. 8.30, Agricultural Report. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Schumann and Brahms Song Recital by Anna Tibell: Songs (Schumann): (a) Der Nussbaum, (b) Volksliedchen, (c) Du bist wie eine Blume, (d) Frühlingnacht; Songs (Brahms): (a) Ständchen, (b) Sandmännchen, (c) Feldeinsamkeit, (d) Sonntag, (e) Der Jäger.  
**OSTERSUND**.—See **Stockholm**.

**PALERMO**  
558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Notes, Tourist Talk, Agricultural Report and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.30, Time and Announcements. 7.45, Orchestral Concert; Soloists, Grasso (Violin) and Eva Parlato (Soprano): Persian Dance and Gopak (Mussorgsky); Prelude and Allegro for Violin (Pugnani-Kreisl); Suite, Roma (Bizet); Soprano Solos: (a) Non mi ricordò più (Santoliquido), (b) Torna, amore (Buzzi Peccia); Violin Solos: (a) Souvenir (Drdla), (b) Die Biene (Schubert-Prinzip); La Procession nocturne (Raband); Soprano Solos: (a) Aria from Ero e Leandro (Bottesini), (b) Aria from Hérodiade (Massenet); Marche exotique (Saint-Saëns). In an interval, Talk: Confessions before the Microphone. After the Concert, Gramophone Music. 10.0, Gironale Radio.

**PARIS**  
**EIFFEL TOWER**, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals)—5.45 p.m., Le Journal Parlé. 8.15, Orchestral Concert, conducted by Flament: Septet, Op. 20 (Beethoven); Symphonic Poem, Vltava (Smetana); Rhapsody in Blue (Gershwin); Waltz, Künstlerleben (Strauss). 9.0 (approx.), Close Down.

OCT. 25th **WEDNESDAY** continued

**PARIS**  
**POSTE PARISIEN**, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Selection from Lohengrin (Wagner), on Gramophone Records. 7.15, Le Journal Parle. 7.30, New Gramophone Records. 8.0, Social Assurance Report. 8.5, Wireless Technical Talk. 8.15, Interval. 8.30, La Tournee des Grands Duos—Play about the year 1900 (Raymond Cogniat and Louis Cheronnet). In the interval, commentary on a Legal Case. 10.30, Dance Music from the Lido. 11.0, News.

**PARIS**  
**RADIO PARIS**, Call GFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture (cont.). 7.45, Gramophone Music. 8.0, Press Review and Weather. 12 Noon, Educational Talk. 12.15 p.m., Gramophone Music: Military Waltz (Ganne); Les fiancés de Rosporden (Goguellet); Selection from H Guarany (Gomez); Triumphant March (Grieg). 12.30, Art Notes, followed by Organ Recital, relayed from Gaumont Palace. 1.0, Exchange, News and Weather. 1.5, Gramophone Music (cont.): Bizet Programme: Roma; Extracts from The Pearl Fishers; Overture, Patrie; Song from The Fair Maid of Perth; Farandole from L'Arlésienne; Agnus dei; Extracts from Carmen. In the interval at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.20, Exchange, Weather and Agricultural Notes. 6.30, Talk on Wine. 6.50, Two Symphonic Dances (Coppola), on Gramophone Records. 7.0, Medical Talk. 7.20, Concert: Selection from Lilac Time (Schubert-Berté); Melody (Wetehemitz); Pour un baiser (Tosti); Scherzo Waltz (Chabrier); Selection from Die Fledermaus (Joh. Strauss); Rondo brillant (Weber). 7.45, Commercial Notes and News. 8.0, Reading (Somerset-Maugham). 8.30, News and Weather. 8.40, Fashion Talk. 8.45, Concert, conducted by Paul Paray: Symphony in B Flat (Chausson); Ballet Music from Prometheus (Beethoven); Le Fontane di Roma (Respighi); Romanian Rhapsody (Enesco). In the interval at 9.15, Press Review and News.

**PITTSBURGH**  
**KDKA**, 980 kc/s, 306 metres; 50 kW. Relay by **WBXK** on 48.86 metres and 25.27 metres.—7.0 p.m., Musical Originalities, from New York. 7.30, KDKA Home Forum. 8.0, U.S. Navy Band. 8.15 to 9.30, New York Relay. 8.15, Utility Hall. 8.30, Dixie Days. 9.0, Betty and Bob. 9.15, Southern Symphonies. 9.30, Frances Ingram. 9.45, News and Market Reports. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News and Piano Classique. 11.15, Sports Notes, Pat Haley. 11.30, Pittsburgh Spotlights. 11.45 to 12.30 a.m. (Thursday), New York Relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15, Gems of Melody. 12.30, What would you do? 12.45 to 3.30, New York Relay. 12.45, Variety Programme. 1.0, Crime Clues. 1.30, Potash and Perlmutter. 1.45, Red Davies. 2.0, Warden Lawes. 2.30, John McCormack and Orchestra. 3.0, Ortiz Tirado.

**POZNAN**  
 896 kc/s, 335 metres; 1.9 kW.—6.5 p.m., Miscellaneous Items. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 6.55 to 7.0, Interval. 7.0 to 8.15, See Warsaw. 8.15, Song Recital by Joseph Wolinski (Tenor): Aria from Aida (Verdi); Vieni (Genza); Melody (Tirindelli); Serenata (Toselli); Aria from Mignon (Massenet); The Bells (Niewiadowski); Krakowiak (Moniuszko). 8.35 to 9.25, See Warsaw. 9.25, Talk: The Foreign Press and Poland. 9.30, Time and Sports Notes. 9.45 till Close Down, Programme from Warsaw. 10.30 (approx.), Close Down.

**PRAGUE**  
 614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Moravská-Ostrava. 4.30, Gramophone Music. 4.45, Talk. 4.55, Gramophone Music. 5.5, Agricultural Report. 5.15, Talk for Workers: Workers and Public Libraries. 5.25, News in German. 5.30, German Transmission: Talk for Workers; Talk for Housewives and Market Report. 6.0, Time and News. 6.10, French Lesson. 6.25, The Queen's Collar—One Act Comedy (Hradecany). 7.0, Concert for the Seventieth Anniversary of the Pilsen Sokol Union, relayed from Pilsen. A Sokol Orchestra, conducted by Palacky, and the Hlahol Choral Society. 8.0, Gramophone Music. 8.25, Beethoven Pianoforte Recital by Jan Herman: Sonata in G Op. 49, No. 2; Sonata in F minor Op. 2, No. 1. 9.0, Time and News. 9.15, News in French. 9.30 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**  
**SOTTENS**, 743 kc/s, 403 metres; 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne). Gymnastics, 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Popular Swiss Music on Gramophone Records. 12 Noon (from Lausanne), Financial Notes. 12.10 p.m. (from Lausanne), Gramophone Concert. 1.0,

Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0, See **Schweizerischer Landessender**. 5.0 (from Geneva), Programme for Children. 6.0 (from Geneva), Scientific Review. 6.30, Programme to be announced. 8.30, See **Strasbourg**.

**REYKJAVIK**  
 2.50 kc/s, 1,200 metres; 21 kW.—8.5 p.m., Musical Programme. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, Chimes and News. 9.30, Reading. 10.0, Symphony No. 7 in C Major (Schubert), on Gramophone Records.

**RIGA**  
 572 kc/s, 525 metres; 15 kW.—6.5 p.m., The Sea—Orchestral Concert: Prelude (Glazunov); Suite, Part II of the Tsar Saltan (Rimsky-Korsakov); Largo e Maestoso from Scheherazade (Rimsky-Korsakov); Extract from Tableaux de Boecklin (Woyrsch); Sur les flots (Schmitt); Am Meer (Schubert); The Music of the Sea (Thadewaldt); Stormy Evening on the Coast, from the Peer Gynt Suite, No. 2 (Grieg). 7.5, News. 7.25, Song and Aria Recital: Autumn (Tcherepoutine); Night (Rachmaninov); L'étoile (Glière); Au bord de la mer (Rimsky-Korsakov); Aria from The Fair at Sorotchinsk (Mussorgsky). 7.45, Light Music. 8.30, Dance Music. 9.0 (approx.), Close Down.

**RUKAN**—See Oslo.

**ROME**  
 Call 1RO, 680 kc/s, 441 metres; 50 kW. Relay by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.45 p.m. and 2RO, 11,810 kc/s, 25.4 metres from 4.15 p.m.—12 Noon, Orchestral Concert. In the interval at 12.30 p.m., Giornale Radio and Exchange. 1.0 to 1.15 (approx.), Time and Announcements. 3.30, Children's Radio Review. 3.35, Giornale Radio and Report of the Royal Geographical Society. 4.10, Weather. 4.15 to 5.0, Orchestral Concert: Bibbo (Solazzi); Brigata algebra (De Michel); Overture mignonne (Bece); Cradle Song (Cudotta); Fremiti (Badiali); Una partita (Zandonai); Waltz, Luisita (Barzizza); Melody (Escobar). 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopolavoro and Tourist Reports. 5.57, Report of the International Institute of Agriculture (in Italian and English). 6.10, Agricultural Notes and Market Prices. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time, Announcements and Gramophone Music. 7.15, Medical Talk. 7.30, Giornale Radio and Sports Notes. 7.45, La Belle Hélène—Opera in Three Acts (Offenbach), relayed from the Argentina Theatre. In the intervals, Talk and Announcements. After the Opera, Giornale Radio.

**SALZBURG**—See Vienna.

**SCHENECTADY**  
**WGY**, 790 kc/s, 379.5 metres; 50 kW. Relay at intervals by **W2XAF** on 31.48 metres, and by **W2XAD** on 19.56 metres.—7.30 p.m., Two Seats in the Balcony, from New York. 8.0 to 8.45, Grande Trio, from New York. 12.45 a.m. (Thursday), Stock Reports. 1.0 to 2.30, New York Relay. 1.0, Popular Programme. 1.30, Popular Programme. 2.0, Ipana Troubadours. 2.30, Popular Programme. 3.0, Corn Cob Pipe Club of Virginia, from New York. 3.30, National Radio Forum, followed by Programme Résumé.

**SCHWEIZERISCHER LANDESENDER**  
**BEROMUNSTER**, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.15 to 6.5 a.m., (from Berne), Gymnastics. 11.0 (from Berne), Gramophone Concert. 11.29, Time Signal from Neuchâtel Observatory and News. 11.40 (from Berne), Recital with Commentary: Music which fell Flat. 12.25 p.m. (from Berne), Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Berne), Jack Hylton's Band on Gramophone Records. 3.0 (from Berne), Orchestral Concert. 4.0, Schubert and Schumann Songs on Gramophone Records. 4.30, Concert of Old Chamber Music. 5.0 (from Berne), Programme for Children. 5.30 (from Zürich), Talk: Modern Art in Switzerland. 6.0 (from Zürich), Time, Weather and Market Prices. 6.20 (from Zürich), English Lesson. 6.50 (from Zürich), Der Freischütz—Opera in Three Acts (Weber), relayed from the Municipal Theatre. In an interval at 7.50, Weather and News. 9.45 (approx.), Close Down.

**SOTTENS**—See Radio-Suisse Romande.

**STOCKHOLM**  
 689 kc/s, 436 metres; 55 kW. Relay by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 225.5 kc/s, 1,348 metres;

**Ostersund**, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—12 Noon, Broadcast for Schools. 4.5 p.m., Microphone Report. 4.20, Military Band Concert: March, Il Tamburino Italiano (Gramone); Waltz, Im schönen Maiennacht (Rentzsch); Selection from The Vagabond King (Priml); Potpourri, From Near and Far (Lögren); Toreh Dance (Meyerbeer); Intermezzo, Under African Skies (Jessel); March, My Land and your Land (Donnelly-Romberg). 5.15, Talk from Uppsala, 662 kc/s (453.2 metres). 6.0, Gramophone Music. 6.30, Pianoforte Concerto in D Minor (Rachmaninov), on Gramophone Records. 7.15, The Sober Truth—Play (Montgomery). 9.0, Dance Music. 10.0 (approx.), Close Down.

**STRASBOURG**  
 869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Classical Music on Gramophone Records. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Light Music on Gramophone Records. 2.0, Interval. 4.45, Talk on Electricity. 5.0, Orchestral Concert, conducted by Roskam. Spanish March, Barcelona; Waltz, Myotis (Waldteufel); Tango, Gaby Morlay (Lucchesi); Overture, Madame Favart (Offenbach); Foxtro, Just Friends (Klenner); Potpourri (Rogers); Foxtro, Three Roses (De Rose and Field); Moment musical (Schubert); Boston (Munot and Jekyll); Rumba, Marta (Simons); Foxtro, Desert-Lover (Gay); Two-Step, Madrid (Speyer). 6.0, Trio Concert, relayed from Lille, 1,130 kc/s, 265.4 metres. 7.0, Talk on Insurance. 7.15, Talk in German: Skilled Trades. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Concert relayed from the Palais des Fêtes. The Municipal Orchestra, Choir and Soloists. Conductor: Fritz Munch. Selection from Vom Fischer und syn Fru (Schoeck); Violin Concerto (Geiser); Choir and Orchestra: Verheissung (Brunn). In an interval at 9.30 (approx.), Press Review. 10.30, Orchestral Concert, conducted by Jemie, relayed from the Grand Kléber Tavern, March, The Cadets (Sosa); Suite of Waltzes from Die Fledermaus (Joh. Strauss); Overture, Poet and Peasant (Suppé); Fantasia, Les airs de Padilla (Salabert); Orchestral Suite, Ballet égyptien (Ludwig); Waltz, Donauwellen (Ivanovic); Vi-braphono Solo; Russian March (Ganne). 11.30 (approx.), Close Down.

**STUTTGART**  
**MUHLACKER**, 832 kc/s, 360.5 metres; 60 kW. Relay by Freiburg, 527 kc/s, 570 metres.—12.35 p.m., See Langenberg. 1.30 (from Freiburg), Programme for Young People. 2.30 (from Freiburg), Accordion Duets: March, Freie Bahn (Blenkenburg); Waltz (Aseher); Wiener Flakerlied (Pick); Tango, Heimliche Liebe (Günther); Russian Romance (Pavlovicz); March (Thöni). 3.0, See Frankfurt. 5.0 to 5.35, See Langenberg. 5.35, Talk: The New Motor Roads. 5.50, Time, Agricultural Notes and Weather. 6.0, Transmission for all German Stations relayed from Frankfurt. 7.10, See Langenberg. 9.0, See Munich. 9.20, Talk: Things you should know. . . . 9.30, See Frankfurt. 9.50, News, Weather and Sports Notes. 10.0, See Frankfurt. 11.0, Serenade. 12 (Midnight), Close Down.

**SUNDSVALL**—See Stockholm.

**TOULOUSE**  
**RADIOPIHONIE DU MIDI**; 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Light Music. 6.30, Songs. 6.50, Favourite Melodies: Chant sans Paroles (Tchaikovsky); Ständchen (Schubert); Talk in the interval. 7.15, News, Racing Results, and Market Prices. 7.30, Accordion Music. 7.45, Extracts from Coppélia—Ballet (Delibes). 8.0, Sound Film Music. 8.15, Opera Music: Selection from Tosca (Puccini); Prelude to Act III of Siegfried (Wagner); Overture, Norma (Bellini); Overture, La Traviata (Verdi); Gavotte from Mignon (Thomas); Polovstian Dances from Prince Igor (Borodin). 10.45, Oprettina Music: Air from The Land of Smiles (Lehar); Come Gipsy, from Countess Maritza (Kálmán); Air from L'amour masqué (Messager); Air from The Great Mogul (Andran). 9.0, Sponsored Mandoline Concert. In the interval, Opera Music: Recitative and Aria from L'enfant prodige (Debussy); Cavatina from William Tell (Rossini); Aria from Figaro (Mozart); Air from L'attaque du Moulin (Bruneau). 10.15, North African News. 10.30, Concert of Viennese Music for Listeners in Morocco. 11.0, Request Music. 11.15, Dance Music. 12.0 Midnight, News, Weather, and Announcements. 12.5 a.m. (Thursday), Chansonnettes. 12.15, Light Music. 12.30 (approx.), Close Down.

**TRIESTE**  
 1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

**TRONDHEIM**—See Oslo.

**TURIN**  
 1,096 kc/s, 273.7 metres; 7 kW. Relay by Milan, 305 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Song Recital. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolavoro Announcements, and Gramophone Music. 6.0, Time, Tourist Talk, and Gramophone Music. 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio, and Weather. 7.15, Medical Talk. 7.30, Gramophone Music. 8.0, Donna lombarda—Opera in One Act (Cicognini), relayed from the Vittorio Emanuele Theatre. 9.0 (approx.), Gianni Schicchi—Opera in One Act (Puccini). In the interval, Talk. After the Opera, Giornale Radio.

**VATICAN CITY**  
 15,120 kc/s, 19.84 metres (Morning), and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10 to 10.15 a.m., Religious Information in Spanish. 7.0 to 7.15 p.m., Religious Information in Italian.

**VIENNA**  
 581 kc/s, 517 metres; 100 kW. Relay by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer; Soloists: Jaro Schmid (Violin), Anton Ludwig (Piccolo), and Josef Wölflé (Bassoon); Overture, The Hermit's Bell (Maillart); Romance for Violin (Beethoven); Selection from Carmen (Bizet); Minuet (Bocherini); Mazurka (Chopin); Waltz, Sphärenklänge (Jos. Strauss); March, Für Vaterland und Freiheit (Blankenburg); Piccolo and Bassoon Duet, The Elephant and the Gnat (Kling); Hoch, hoch vom alten Stephanssturm (Glück); Intermezzo, Asta (Leopold); Waltz, Ewältelcher (Ziehrer); Im Ural (Erwin); Die kleine Kompagnie (Ganglberger); Old Viennese Song Potpourri (Muss). In the interval at 12 Noon, Time and News. 1.0 p.m., Interval. 2.0, Time, Weather, and Exchange. 2.20, Talk for Young People. 2.45, The Edith Lorand Orchestra on Gramophone Records. 3.25, Talk on Phraseology. 3.50, Talk: The Nervous Teacher. 4.15, Concert of Music by Fritz Schreiber; The Sedlak-Winkler Quartet and Soloists; Erika Rokyta (Soprano), Jella Pessl and Fritz Schreiber (Pianofortes); Concertino for Two Pianofortes, Op. 55; Soprano Solos: (a) Gib mir den Anblick deines Seins, (b) Die Rose. (c) Abendrot. (d) Wer bin ich? String Quartet No. 6, Op. 52. 5.5, Talk: The First Austrian Shorthand Typewriting Competition. 5.15, Health Talk. 5.40, Talk: American Economics. 6.5, Concert by the Wiener Symphoniker, conducted by Josef Holzer: March, A echter Weaner (Bednarz); Overture, Eine Nacht in Venedig (Joh. Strauss); Waltz, My Herb (O. Strauss); Waltz, An der schönen grünen Narenta (Komzak); Schelsucht (Arnold); Tarantella (Helmberger); Potpourri, Von Wien durch die Welt (Hrubý); Waltz, Mein Lebenslauf ist Lieb' und Lust (Jos. Strauss); March, Gruss aus Steierland (Trauner). In the interval at 6.35, Time, Weather, and Programme Announcements. 7.5, Beethoven Symphony Concert by the Gesellschaft der Musikfreunde, relayed from the Musikvereinsaal. The Wiener Symphoniker, conducted by Robert Heger. Soloist: Edwin Fischer (Pianoforte); Leonora Overture, No. 2; Pianoforte Concerto in C Minor, Op. 37; Symphony, No. 4, in B Flat, Op. 60. In the interval at 8.0 (approx.), News. 8.50, Announcements. 9.0, Concert, relayed from the Oase. After the Concert, Announcements.

**WARSAW**  
 212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Gramophone Concert. In an interval at 11.30, Radio Journal and Weather Report. 12 Noon, Interval. 2.30, Talk on Economics. 2.40, Pianoforte Recital: Sonata (Ravel); Three Pieces (Debussy): (a) Clair de lune, (b) La puerta del Vino, (c) L'isle joyeuse; Concert Etude (Poldini); Piece (Sauer). 3.10, Programme for Children. 3.40, Book Review. 3.55, Symphonic Suite, Don Quixote (R. Strauss), on Gramophone Records. 4.50, Answers to Agricultural Correspondence. 5.0, Talk relayed from Craeow, 959 kc/s (312.8 metres). 5.20, Choral Concert. 6.5, Miscellaneous Items. 6.25, Reading. 6.40, Programme announcements. 6.45, Radio Journal. 7.0, Song Recital. 8.0, Reading. 8.15, Song Recital, relayed from Poznan, 896 kc/s (335 metres). 8.35, Pianoforte Recital by Jacob Gimpel. 9.0, Sports Notes. 9.10, Talk in Esperanto. 9.25, Dance Music, relayed from the Café Adria. 10.0, Aviation Weather Report and Police Notes. 10.5, Dance Music (contd.).

**ZAGREB**  
 977 kc/s, 307 metres; 0.75 kW.—6.0 p.m., Talk: Esperanto. 6.20, Announcements. 6.50, Talk on the following Transmission. 7.0, Relay of an Opera from Ljubljana. News, Weather and Programme Announcements in the interval. 10.0 (approx.), Close Down.

**ZURICH**—See Schweizerischer Landessender.

## ALGIERS

824 kc/s, 364 metres; 13 kW.—7.20 p.m., Gramophone Concert. 7.55, News. 8.0, Time and Lottery Results. 8.10, Les Hommes Femmes—One-Act Comedy (Henry Becque). 8.40, News. 8.45, Talk: Curiosities and Hobbies. 9.5, Request Gramophone Concert. In an interval at 9.30, News. 9.55, News. 10.0, Eastern Music.

## ATHLONE

225 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations, and Gramophone Concert. 6.0, Programme for Children. 6.40, News. 7.0, French Lesson. 7.15, Talk. 7.30, Time Signal. 7.31, Dr. Annie Patterson in a Programme of her own Compositions. 8.0, Contralto Solos by Betty Byrne. 8.15, The Station Orchestra. 8.45, Baritone Solos by Robert Irwin. 8.55, The Station Orchestra. 9.10, Baritone Solos (cont'd). 9.20, Mezzo-Soprano Solos by Lily Kelly. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Dance Music: Jog along; I guess I'll have to change my Plans; Mary; Puss, puss, puss; My love Song; I cover the Waterfront; I can't remember; Isn't it heavenly. 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., Waltz, Amoureuse (Berger); Black Eyes (Ferrari); Hindu Song (Rimsky-Korsakov); Racing Commentary; Play gipsies, dance gipsies (Kalmann); Violin Solo: Hejre Kati (Hubay); Plegaria (Bianco); Waltz Improptu (Andrayev). 10.30, I.B.C. Good-night Melody, followed by News and Weather. 10.40, Uilleann Pipe Music 11.0 (approx.), Close Down.

## BARCELONA

EAJ1. 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert. In the interval, Talk. 7.0, Request Gramophone Records. 7.30, Exchange and Gramophone Records (cont'd). 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices. 9.5, Concert by the Station Orchestra: Hungarian March from The Damnation of Faust (Berlioz); Dance from Las Golondrinas (Candizaga); Demande et réponse (Coleridge Taylor); Minuet (Beethoven); Appassionata (Lilipucci); Overture, Don Giovanni (Mozart). 10.0, La cursi del Inigo—Play in Three Acts (Luis de Vargas). In the interval at 11.0, News. 12 Midnight (approx.), Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—3.30, Talk for Women. 3.50 to 5.35, See Rome. 5.35, News in Albanian. 5.45 till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 420.4 metres; 2.8 kW.—7.0 p.m., Programme relayed from Zagreb, 977 kc/s (307 metres). 9.0, Time and News, followed by Dance Music on Gramophone Records. 9.40, Cigány Music from the Restaurant Dva Jelena.

## BERLIN

DEUTSCHLANDSENDER (Reichssender) 183.5 kc/s, 1,635 metres; 60 kW.—11.5 a.m., Gramophone Concert: Unsere Fahne flattert uns voran (Borgmann-v. Schirach); Die Mainacht (Brahms); Creole Waltz (Carrera); Morgen (R. Strauss); Drunt in der Loban (Strocker); Ein Kuss und sonst gar nichts (Michel-Eisemann-Amberg); Wenn der Tag zur Neige geht (Michel-Eisemann-Amberg); In the Temple of the Bells (Yoshitomo); Turkish March (Mozart); Air from Martha (Flotow); Unter dem Lindenbaum (Eberle); Neckerstein (Sommerfeld); Hungarian Dance (Kahut); Rheinländer (Kahut); March, Dorothee (Landschulz-Schoppe); Deutschland erwache. After the concert, Weather. 11.55, Time. 12.45 p.m., News. 1.0, Gramophone Concert (cont'd): Overture, Sicilian Vespers (Verdi); Overture, Donna Diana (Reznicek); Selection from Sigurd Jorsalfar (Grieg); Overture, Le Maçon (Auber); Overture, Boecaccio (Suppé); Hungarian Rhapsody No. 6 (Liszt); Invitation to the Dance (Weber); Waltz, Bei uns zu Haus (Strauss). 1.45, Programme for Children. 2.15, Talk: German Youth in Hungary. 2.30, Weather and Exchange. 2.45, Reading (Gustav Freyssen). 3.0, See Heilsberg. 4.0, Talk for Women. 4.20, Quintet in F Minor, Op. 34 (Brahms), by the Berlin String Quartet and Else Krauss (Pianoforte). 5.0, Poems. 5.5, Hallo, what is that—a Guessing Competition. 5.30, Educational Talk. 5.50, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, Act I of Così fan tutte Opera (Mozart), relayed from The Municipal Theatre, Breslau. 8.0, See Berlin (Funkstunde). In the interval at 9.0, News, and at 9.45, Weather. 11.0 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—2.20 p.m., Gramophone Concert: Piano-forte Solos: Ecossaises (Beethoven); Baritone Solos (Schubert): (a) Das Rosenband, (b) Der Musenlohn; Violin Solos: (a) The Dance (Scott), (b) La Capriciosa (Ries); Soprano Solos (Schumann); (a) Du bist wie eine Blume, (b) Widmung; Piano-forte Solos

(Brahms): (a) Waltzes Op. 39, Nos. 1, 2, and 15, (b) Hungarian Dances Nos. 6 and 7; Baritone Solos (Wolf): (a) Biterolf, (b) Der Tambour; Pianoforte Concerto in E Flat (Liszt). 3.15, The Hobby Horse—A Humorous Programme. 3.30, Popular Concert on Gramophone Records. 4.25, Reading. 4.45, Mozart Pianoforte Recital by Lili Kroeber-Asche; Fantasia in C Minor; Sonata in D. 5.10, A Painter and Five Pictures—An Interview between Prof. Arthur Kampf and Irmgard von Sten (on Gramophone Records). 5.30, The Funkstunde informs its Listeners... 5.35, Report from Magdeburg. 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.5, Variety Concert by Willi Schönfeld's Orchestra, Eugen Jahn's Orchestra, Hans Emmé-Schulhardt, and Soloists. In the intervals at 9.0 (approx.), News and Sports Notes, and at 10.0, Topical Talk. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.40, Talk arranged by the International Labour Bureau. 7.55, Lottery Results. 8.0, Talk on Wine. 8.15, News. 8.30, L'Appassionata—Comedy in Four Acts (Pierre Frondaie).

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.50 p.m., Song Recital. 5.15, Educational Talk. 5.25, Concert of Light Music by the Station Orchestra. 5.55, Talk for Housewives. 6.5, Programme to be announced. 6.20, See Prague. 9.50 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—11.0 a.m., Concert by the Station Orchestra, conducted by Rischka: Overture: Der Freischütz (Weber); Kinderszenen Suite (Schumann-Risehka); Norwegian Dance No. 4 (Grieg); Selection from Mona Lisa (Max von Schillings); Waltz, Abendsterne (Lanner); Viktoria regia (Künneke); Heimweh (Wolf-Huppertz); Verborgeneheit (Wolf-Huppertz); Moment musical (Schubert); Selection from Der Tenor der Herzogin (Künneke); Puppenwälder (Bayer); Quadrille, Sonntagkind (Müllacker); Selection from Der lustige Krieg (Joh. Strauss). 12.45 p.m., Time and News. 1.10, Baritone Song Recital by Alberto Uzzelli; Songs (Brahms): (a) Botschaft, (b) Die Schuur, (c) Auf dem See, (d) Feldensamkeit; Songs (Zilcher): (a) Nüsse Sorgen, (b) Mitternacht, (c) St. Nepomuk Vorabend, (d) Blick um Blick. 1.40, Programme arranged by the Post Office with Gramophone Records. 2.0, Agricultural Prices. 2.15, Reading. 2.35, Tourist Talk: The Beauties of the Silesian Coast. 2.45, Programme for Children. 3.10, Orchestral Concert, relayed from Bad Altheide: Overture, Im Reich der Indra (Lincke); Waltz (Heinecke); Slav Rhapsody (Friedemann); Solveig's Song from the Peer Gynt Suite (Grieg); Selection from Cavalleria rusticana (Mascagni); Die Spieluhr (Blauuw); Selection from Where the Lark Sings (Lehár); Flirtation (Rau); Erotic Suite (Kubmann). 4.45, Agricultural Prices. 5.50 (approx.), Talks by Workers and their Leaders. 5.10 Martin Luther Songs, sung to the Lute by Hermann Munk; Gramophone Record: Tocatta and Fugue (Bach); Vater unser im Himmelreich; Erhalt uns, Herr, bei deinem Wort; Ach Gott, vom Himmel sieh darein; Ein feste Burg ist unser Gott; Mitten wir im Leben sind; Mit Freid und Freud ich fahr dahin; Ein Lied für die Kinder; Die beste Zeit im Jahr ist mein; Preludium and Fugue in G for Organ (Bach) on Gramophone Records. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, Community Singing, relayed from the Concert Hall. 9.0, Time and News. 9.25, Programme, relayed from Berlin (Funkstunde). 11.0 (approx.), Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—3.0 p.m., Concert by the Station Orchestra. 3.50, See Moravská-Ostrava. 4.15, Programme for Children. 4.25, See Prague. 4.50, Gramophone Music. 5.0, Theatre and Film Review. 5.15, See Prague. 5.25, German Transmission: News and a Radio Play (A. Schütz). 6.0, See Prague. 6.5, Programme to be announced. 6.20, See Prague. 9.50 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Gramophone Concert: Overture, Don

Pasquale (Donizetti); Spatzeparade (Rathke); Spanish Caprice (Moszkovsky); Offenbach Potpourri (Finck); Alter Refrain (Kreisler); Overture, Show Boat (Kern); Gipsy Serenade (Borghov); Un poco triste (Suk); Aria from Othello (Verdi); Guadros (Laparra); Ballet Music from Hamlet (Thomas). 1.0 p.m., Le Journal Parlé. 1.10, Gramophone Concert of Light Music. 5.0, Concert by the Radio Orchestra, conducted by Walpot: Radetzky March (Joh. Strauss); Waltz, Aimer toujours (Paradis); Overture, The Merry Wives of Windsor (Nicolaï); Clochettes argentines (Weyts); Mattinata (Leoncavallo); Hungarian Dances (Brahms). 5.30, Programme for Children. 6.0, Talk: Women's Work. 6.15, Accordion Music and Dance Music on Gramophone Records. 7.15, Talk for Workers. 7.30, Sports Notes. 8.0, Overture, Tannhäuser (Wagner) by the Station Symphony Orchestra, conducted by Kumps. 8.15, Extracts from Le Bourgeois Gentilhomme—Play (Molière). 8.45, Talk: The Middle Classes. 9.0, Concert by the Radio Orchestra, conducted by Walpot: March, The Liberty Bell (Souza); Overture, Orpheus in the Underworld (Offenbach); Waltz, Frühlingstimmen (Joh. Strauss); Selection from The Land of Smiles (Lehár); Gramophone Records: Brissement sous bois (Razigade); Suppé Potpourri (Michaelov). 10.0 Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—12 Noon, Gramophone Concert of Light Music. 1.0 p.m., Le Journal Parlé. 1.10, Italian Opera Music on Gramophone Records: Overture, William Tell (Rossini); Addio alla made from Cavalleria rusticana (Mascagni); Arias from (a) La Traviata (Verdi), (b) The Barber of Seville (Rossini); Selection from I Pagliacci (Leoncavallo); Duet from Madame Butterfly (Puccini); Aria from La Favorita (Donizetti); Chorus from The Force of Destiny (Verdi). 5.0, Concert by the Station Symphony Orchestra, conducted by Kumps: Selection from A Midsummer Night's Dream (Mendelssohn); Dance from Khovanstchina (Musorgsky); Tarantella (Cui); Extract from the Suite, Scherzade (Rimsky-Korsakov). 5.45, Programme for Children. 6.30, Gramophone Concert of Popular Music. 7.10, News. 7.15, Religious Address. 7.30, Talk for Women. 8.0, Sacred Concert by the Radio Orchestra, conducted by Walpot, the Symphony Orchestra, conducted by Kumps, and a Choir: March of the Priests from Athalia (Mendelssohn); Overture, The Messiah (Handel); Le chant du Christ-Roi; Choir, Kerels der Noordzee; Speaking Choir: De Kleren Christi, from Christensen (Theophilus); Procession flamande (Leemans); Gramophone Record: Extract from the St. Matthew Passion (Bach); Overture, Oberon (Weber); Two Songs; Speaking Choir: Dood voor den Koning, from Christus (Theophilus); Two Songs; Fantasia on Two Flemish Airs (De Boeck); Overture, Tannhäuser (Wagner). 9.55, Evening Prayer. 10.0, Le Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert of Variety Music by the Dinco Orchestra. In an interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Talk. 6.40, Madame Butterfly—Opera in Three Acts (Puccini), on Gramophone Records. In the intervals, Radio Journal.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 6.20 p.m. till Close Down.—4.30 p.m., Talk, followed by Concert by the Szikla Double Quartet. 5.50, Programme for Workers. 6.20, Concert by the Opera House Orchestra, conducted by Fridl: Overture, Phédre (Massenet); Selection from Adrienne Lecouvreur (Cilea); Hungarian Suite (Wiener); Selection from The Czarevitch (Lehár). 7.40, Gottes Burg—Mystery Play in Three Acts (Abraham). 9.0, News. 9.15 (approx.), Concert by the Lajos Kiss Cigány Band from the Café Baross. 10.15, Dance Music from the Café Baross.

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from The Town Hall. 11.2, Concert by the Harald Andersen String Ensemble, relayed from the Hotel d'Angleterre. 1.0 p.m., Interval. 1.45, Danish Dance Music by Sid Merriman and his Band. In an interval at 2.30, Reading. 3.45, Programmes for Boys. 4.30, Exchange and Fish Market Prices. 4.45, Talk. 5.15, Elementary English Lesson. 5.45, Weather. 6.0, News. 6.15, Time Signal. 6.16, Talk. 6.45, Danish Lesson. 7.10, Concert by the

Radio Symphony Orchestra, relayed from the State Broadcasting Building; Conductor, Nikolai Malko; Soloist, Helge Rosvaenge (Song); Symphony No. 2 in D, Op. 36 (Beethoven); Recitative and Aria from Idomeneo (Mozart); Moon's Aria from Oberon (Weber); Overture, Oberon (Weber). Interval. First Movement from Manfred (Tchaikovsky); Aria from L'elisir d'amore (Donizetti); Aria from Manon Lescaut (Puccini); Spanish Caprice (Rimsky-Korsakov). 9.15, News. 9.30, Reading. 9.50, Dance Music by the Aage Juul-Thomsen Band, relayed from the National Scala. In an interval at 11.0, Time Signal and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

## CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Talk: Old Cracow. 6.20, Miscellaneous Items. 6.25, See Warsaw. In the intervals at 6.40, Programme Announcements, and at 9.0, Sports Notes. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—10.30 to 11.30 a.m., Programme in English by the I.B.C. Happy Hour. Part I, Orchestral Music: Signature Tune; Fairy on the Clock (Myers); Play of Butterflies (Heykens); Song: Scot in Exile (Gallatly); Valeta Medley (Varney); The Match Parade (Welle); Song of the Trump (Sievier); The Valley of the Poppies (Ancliffe); A Sprig of Heather (Munroe-Steward). Part II, Dance Music: Egypt; My Gipsy Rhapsody; A Girl like Nina; My Kingdom for a Smile from you; I raised my Hat; With my Guitar and you; I bring a Song; Let's make up; Signature Tune. 11.30, Programme in French. 4.50 to 6.0, Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Organ Recital for Worthing and Littlehampton Listeners: Signature Tune: The Night by the Sea; Hold Me (Schuster); The Old Spinning Wheel (Hill); Song, Letting in the Sunshine (Gay); Friends once more united (Spoliarsky); Song: You're still in my Heart (Dougherty); Wandering by an Old Cathedral Garden (Gilbert); In the Valley of the Moon (Tobias); There's an Organ playing in my Dreams (Condon). 5.20, Octet Concert for Brighton and Hove Listeners: Ballet Music from Rossamund (Schubert); Waltz from Der Rosenkavalier (R. Strauss); Song: On the Banks of Allen Water (Horn); La Filense (Raff); Goliwog's Cakewalk (Debussey); Song: My Aick Folk (Mills); Valse bleuet (Drigo); Mock Morris (Grainger); Signature Tune. 5.0, Programme in French. 10.0 (approx.) till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune: Bells of Normandy; I live for Love; Let's call it a Day; I'll show you off; Oh! Johanna; Lover; Bugle Call Rag; Sweet Dreams Pretty Lady; Spanish Eyes; Wood Violets; Sing another line; Let's make it up; Five-fifteen; Don't blame me; Egypt; Maria my own; I've got to pass my house; Signature Tune. 11.0, Tunes from the Talkies: Signature Tune: Sitin' in the Dark; Selection from Gold Diggers of Broadway (Dubin); Song: Dark Red Roses; Sous les toits de Paris (Moretti); Just because I lost my Heart (Gilbert); The Rogue Song; Good Friends (Heymann); Cuban Love Song (Fields); Selection from Show Boat (Kern); Signature Tune. 11.30, Concert by the International Broadcasting Company (Ireland), Ltd., on behalf of Irish Hospitals Sweepstakes Authorities: Signature Tune: Come back to Erin; Overture, Alessandro Stradella (Flotow); Les Millions d'Arlecini (Drigo); Selection from Swan Lake (Tchaikovsky); Violin Solos: (a) Boys at the Lough, (b) Tom Clarke's Reel; Prelude to Carmen (Bizet); Hungarian Dance No. 5 (Brahms); In the Hall of the Mountain King, from the Peer Gynt Suite (Grieg); Selection from La Traviata (Verdi); Signature Tune: Come back to Erin. 12.5 a.m. (Friday), I.B.C. News Bulletin in English. 12.10 (approx.), Club Concert for Edington, Bratton and Westbury Listeners: Signature Tune: The Chum Song; Heaven for Two (Pepper); Todavia (Pizarro); Deep Night (Vallee); Mariette (Luechsi); If you'll beckon with your Finger (Montague); Louisiana Lullaby (Newman); A Girl like Nina (Hammerstein); Sundown in a little Green Hollow (Whiting); My Moonlight Madonna (Fibich); Lazybones (Mercer); I've found the Right Girl (Lupino); Flor de Cuba (Conyers); My Kingdom for a Smile from you (King); Signature Tune. 1.0, Dance Music: Signature Tune: Bells of Normandy; Twist the Devil and the Deep Blue Sea (Eyton); Hold your Man (Freed); I Raised my Hat (Franz); Down the Old Ox Road (Coslow); The Shadow Waltz (Warren); Aloha Oe (Lilinalani); There's a Cabin in the Pines (Hill); Let's all be happy together (Leslie); Lover's Lane (Miller); Ding, Dong, Ding (Hargreaves); You're an old Smoothie (Whiting); And so I married the Girl (Meyer); Sweep (Purber); Chansonnette (Friml); Spanish Sweetheart (Hargreaves); Happy as the Day is long (Kochler); Signature Tune. 2.0, I.B.C. Good-night Melody and Close Down.

Radio Symphony Orchestra, relayed from the State Broadcasting Building; Conductor, Nikolai Malko; Soloist, Helge Rosvaenge (Song); Symphony No. 2 in D, Op. 36 (Beethoven); Recitative and Aria from Idomeneo (Mozart); Moon's Aria from Oberon (Weber); Overture, Oberon (Weber). Interval. First Movement from Manfred (Tchaikovsky); Aria from L'elisir d'amore (Donizetti); Aria from Manon Lescaut (Puccini); Spanish Caprice (Rimsky-Korsakov). 9.15, News. 9.30, Reading. 9.50, Dance Music by the Aage Juul-Thomsen Band, relayed from the National Scala. In an interval at 11.0, Time Signal and Chimes from the Town Hall. 11.30 (approx.), Close Down.

FLensburg.—See Hamburg.

FLORENCE.—See Turin.

OCT. 26th **THURSDAY** continued

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News, 12.25, Local News and Weather, 12.35 to 1.30, See Stuttgart. 2.30, Weather Forecast, 2.40, Time and Economic Notes, 3.0, See Langenberg. 5.0 to 5.35, See Stuttgart. 5.35, Discussion: The Care of the War-Disabled under the Nazi Regime, 5.50, News and Time, 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, Topical Talk, 7.10, See Langenberg. 9.0, Time and News, 9.20, See Stuttgart. 9.30, Local News and Weather, 9.45 to 11.0, See Stuttgart. 11.0, See Langenberg. 12 Midnight, Close Down.

**FREDRIKSSTAD.**—See Oslo.

**GREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBERG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—5.0 p.m., Variety Programme, 5.35, Review of the Musical Programmes for the Coming Week, 5.45, Frankfurt Exchange, 5.50, Weather, 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, Claudine von Villa Bella—Play in Five Acts (Goethe), with Incidental Music by Irmeler, 8.35, Programme from Berlin (Funkstunde). In the interval at 9.0, Time and News, 12 Midnight, Close Down.

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 562 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert. In the intervals at 12.20 and at 1.0, News, 1.30 (from Danzig), Exchange, 2.0, Agricultural Prices and Exchange, 2.30, Programme for Young People, 3.0 (from Danzig), Concert by the Municipal Theatre Orchestra, conducted by Lenzer: Overture, Schach der König (Brüll); Waltz, Süsse Mädchen (Reinhardt); Serenade (Schmalstich); Contes villageois (Gillet); Selection from Don Giovanni (Mozart); March, Vindobana (Konzak); Selection from Herzog Wlfdang (Siegfried Wagner); Potpourri of Carinthian Folk Tunes; Scherzo in B Flat (Schubert); Overture, The Water Carrier (Cherubini). In the interval at 4.0 (approx.), Talk on Photography, 4.50, Medical Talk: The Growth of the Child, 5.15, Agricultural Prices, 5.25, Agricultural Programme, 5.50, Weather, 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, News and Weather, 7.10, The Celestial Orchestra—Radio Sequence (Fortner), 8.0, Concert by the Königsberg Opera House Orchestra, conducted by Hrubetz: March, Feisenfest (Reckenwald); Overture, Poet and Peasant (Suppé); Waltz, Seid umschlungen, Millionen (Joh. Strauss); Overture, Eva (Lehár); Polka, Eroh durchs Leben (Aichelberg); March (Frantz), 9.0, News and Weather, 9.20, Elementary English Lesson.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 20 kW. (7 kW. up to 5.40 p.m. and 20 kW. from 5.40 p.m.). Programme of the General Broadcasting Company (A.V.R.O.).—11.41 a.m., Concert by the Wireless Orchestra, conducted by Nico Treep: March, Hollywood (Leopold); Overture, Pique Dame (Suppé); Flattergeister (Jos. Strauss); Lortzing Potpourri (Urbach); Die kleine Kompanie (Ganglberger); Kirschblütenfest (Dieker); Selection from Madame Butterfly (Puccini); Moonlight on the Alster (Petras); Salut d'amour (Elgar); Albumblatt (Wagner); Potpourri, Minutenspiele (Petras); Selection from Cavalleria rusticana (Mascagni). In the intervals, Gramophone Music, 1.55 p.m., Interval, 2.10, Concert by the Wireless Orchestra, conducted by Nico Treep: Dance of the Hours from La Gioconda (Ponchielli); Selection from Isoline (Messager); Toréador et andalouse (Rubinstein), 2.40, Dressmaking Lesson, 3.25, Gramophone Music, 3.40, Programme for Hospitals, 4.10, Concert by the Wireless Orchestra, conducted by Nico Treep: Cinderella Suite (Coates); Adagio for String Orchestra (Lékué); March of the Tin Soldiers (Piercé), 4.40, Programme for Children, 5.10, Concert (cont'd.); March, Tovsin (Freitag); Overture, Si j'étais roi (Adam); Piece (Noack); Orientzauber (Dieker); Intermezzo (Ciere); Kind, du kannst tanzen (Fall); Offenbachiana (Conradi), 6.10, Sports Talk, 6.40, Quartet Concert: Quartet in D (Haydn); Two Noctettes (Glazunov), 7.10, English Lesson, 7.40, Time Signal, 7.41, News, 7.45, Gramophone Music, 7.55, Concert by the Concertgebouw Orchestra, conducted by van Beinum, relayed from the Concertgebouw, Amsterdam; Soloist, Marix Loevensolin ('Cello), 8.55, Gramophone Music, 9.10, A Radio Play, 9.55, Concert of Light Music by Hans Schindler and his Orchestra, 10.40, News, 10.50, Gramophone Music, 10.55, Concert (cont'd.), 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. up to 3.40 p.m., Transmitted from Kootwijk from 3.40 p.m.—11.55 a.m. till 1.40 p.m., Programme by the Catholic Radio Society (K.R.O.), 11.55, Concert by the K.R.O. Orchestra, conducted by van 't Woud: March, Schönfeld (Ziehrer); Overture, King Midas (Eilenberg); Unter den Linden (Strauss); Pumpernickel (Siede); Réverie (Leonavallo); Ballet Suite from Hiawatha (Coleridge-Taylor); Perpetuum mobile (Joh. Strauss); Viva el Torero (Poppy); Overture, Thurmidor (Scassola); Goodbye (To-sti); Marionettenbrautzug (Rathke); Meyerbeer Potpourri (Urbach); Unter dem Doppel-Adler (Wagner). In an interval at 12.40 p.m., Gramophone Music, 1.40 till Close Down, Programme of the Christian Radio Society (N.C.R.V.), 1.40, Talk: Spare-Time Hobbies, 2.40, Gramophone Music, 3.10, Interval, 3.40, Bible Reading, Baritone Solos and Organ Recital, 4.40, Handwork Lesson for Children, 5.10, Soprano Solos by Mme. Rook-van Leeuwen. In the intervals, Gramophone Music, 6.10, Gramophone Music, In an interval at 6.40, Police Notes, 7.10, Press Review, 7.40, Concert by the Cen Grazia Mandoline Orchestra, conducted by Kwist; Soloist, Blaauw (Organ). In an interval at 7.55, Talk, 8.40, Talk, 9.10, Concert (cont'd.), 10.10, News, followed by Gramophone Music, 11.10 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, Financial Notes, Racing Results and News, 8.10, Talk on Science, 8.25, Radio Concert, 9.0, News and Weather, 9.15, Louis Abbiate Concert of Chamber Music.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LAHTI**

167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—4.0 p.m., Concert by the Station Orchestra: March, Heil Europa (von Blom); Overture, Die Schöne Galathee (Suppé); Waltz, Wienerblut (Strauss); Hungarian Potpourri (Leopold); Hungarian Rhapsody No. 14 (Liszt), 5.15, Talk, 5.40, Carl Hirn Pianoforte Recital by the Composer, 6.5, Talk, 6.30, Song Recital, 6.55, Recitation, 7.15, Gramophone Music, 7.45, News in Finnish, 8.0, News in Swedish.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—11.0 a.m., Liszt Concert on Gramophone Records; Pianoforte Concerto No. 1 in E Flat; Baritone Solo: Im Rhein, im schönen Strom; Mephisto-Walzer; Tenor Solo: o komm' im Traum; Hungarian Rhapsody No. 1 in F; Gnomemotiven; Tarantella, from the Suite Venezia e Napoli; Baritone Solo: Es muss ein Wunderbares sein; Symphonie Poem, Mazepa, 12.15 p.m., Time and News, relayed from Frankfurt, 12.25, News and Weather, 12.35, See Stuttgart. 1.30, Talk: The Arbitrator, 1.40, Gramophone Concert, 2.10, Talk, 2.30, Market Prices, 2.50, Political Announcements, 3.0, Gala Concert by the Station String Quartet, the Station Choir, and Helma Overzier (Soprano), String Quartet: (a) Interidium (Glazunov), (b) Andante cantabile (Tchaikovsky); Ehestandsgeplauder—Musical Joke for Oboe, Bassoon and Pianoforte (Friedemann); Choir: Songs (Trunk): (a) Wächterlied, (b) Ständchen, (c) Auf der Wiese; Violin Solos (Wieniawski): (a) Romance, (b) Seherzo-Tarantella; Three Songs for Soprano and Harp (Spies): (a) Frohes Erwarten, (b) Uher Felder, über Wiesen, (c) Der fahrende Gesell; Sonata for Flute and Pianoforte (Meyer-Oehersleben); Choir: Folk Songs: (a) Die Verschmitzte, (b) Die drei Röslein, (c) Die Auserwählte, (d) Der ängstliche Liebhaber—Sonata for Cello and Pianoforte (Brevai); String Quartet: Nocturne and Scherzo (Borodin), 5.0, See Stuttgart. 5.35, Talk: The German Skilled Worker, 5.50, Announcements, 6.0, Transmission for all German Stations, relayed from Stuttgart, 7.0, See Frankfurt, 7.10, Karl Maria von Weber—a Biographical Radio Picture (Else Pfaff), with Music, 9.0, See Frankfurt, 9.20, See Stuttgart, 9.30, News, 9.45 to 11.0, See Stuttgart, 11.0, Wagner Concert on Gramophone Records: Prelude to Lohengrin; Two Arias from Tannhäuser; Selection from Tristan and Isolde; Aria from Tristan and Isolde, 12 Midnight, Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—12.15 p.m., News, 12.30, German Folk Songs on Gramophone Records, 1.15, Second News, 1.30, Handwork for Children, 2.0, Concert of Operetta Music by the Station Orchestra, conducted by Theodor Blumer: March from

Der Gascogner (Suppé); Overture, Morning, Noon and Night (Suppé); Waltz from Wiener Blut (Joh. Strauss); Gallop, Tik, Tak, from Die Fledermaus (Joh. Strauss); Overture, Der Bittelstudent (Müllöcker); Polka from Jung Heidelberg (Müllöcker); Sei nicht böse, from Der Obersteiger (Zeller); Waltz from The Bird Fancier (Zeller); Overture, Die Landstreicher (Ziehrer), 3.0, Market Prices, 3.15, Reading (Josef Magnus Wehner), 3.30, Concert by the Symphony Orchestra, conducted by Theodor Blumer; Soloist, Siegfried Grundeis (Pianoforte); Overture, Coriolanus (Beethoven); Malediction, for Pianoforte and Orchestra (Liszt); Siegfried Idyll (Wagner); Two Pieces (R. Strauss): (a) Traum durch die Dämmerung, (b) Morgen; Intermezzo, Op. 5, No. 3 (Schubert), 4.30, Military Talk, 4.50, Market Prices, Weather and Time, 5.0, Soprano and Pianoforte Recital, 5.25, Talk: German Racial Types, 5.50, Today's News, 6.0, Transmission for all German Stations, relayed from Stuttgart, 7.0, Zither and Guitar Recital by Fritz Mühlhölzl; Zug der Landesknechte (Huber); Der Schmettler (Stelzl); Minuet (Mozart); Romance (Mozart); Etude (Alard); The Pirates' March (Alvares); Venezia (Kolmanek), 7.35, Symphony No. 6 in B Minor, Op. 74—the Pathetic (Tchaikovsky), relayed from the Gewandhaus; The Municipal and Gewandhaus Orchestra, conducted by Carl Schuricht, 8.40, Gramophone Music, 9.0, News, 10.0, (approx.), Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Serbo-Croat Lesson, 6.30, Request Gramophone Records, 7.0, Programme from Zagreb, 9.0, Time, News, and Dance Music, 10.0 (approx.), Close Down.

**LUXEMBOURG**

252 kc/s, 1,191 metres; 200 kW. German Evening—7.0, Symphony No. 6 in F—The Pastoral (Beethoven), on Gramophone Records, 7.50, Talk in German: Superstitions, 8.0, Gramophone Music: 1812 Overture (Tchaikovsky); Overture, Tannhäuser (Wagner); Ballet Music from Prince Igor (Borodin), 8.50, News in French, 9.0, Song Recital by Leonardo Aramesco (Tenor), 9.45, News in German, 9.55, Gramophone Records: Potpourri, Servus Wien (Dostal); Selection from The Mikado (Sullivan); Potpourri, Wir flüstern (Dostal), 10.25, Dance Music on Gramophone Records.

**LWOW**

788 kc/s, 381 metres; 16 kW.—6.5 p.m., Announcements, 6.20, Market Prices, 6.25, See Warsaw, 6.40, Programme Announcements, 6.45, See Warsaw, 10.5, Gramophone Music, 10.30 (approx.), Close Down.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—6.15 p.m., Radio Journal, 7.20, Gramophone Music, 7.40, Radio Gazette for Lyons and the South-East, 8.30, Programme relayed from Paris (Ecole Supérieure), 671 kc/s (447.1 metres), followed by News.

**MADRID**

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Dramatic Programme relayed from Madrid, EAJ7, followed by Radio Notes, 12 Midnight to 12.30 a.m. (Friday), Programme in English by the I.B.C.: On a little Street in Honolulu; The Brunette I love; Selection from The Count of Luxembourg (Lehár); I love you; Mama Inez; The Flower of Hawaii; Now, I'm in Love; The Cuban Love Song, 12.30, I.B.C. Good-night Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Radio Journal, and Programme for Children, 8.15, Radio Journal, 8.30 to 9.15, Interval, 9.15, English Lesson, 9.30, Chimes, Time, and Topical Review, 9.45 (approx.), Dramatic Programme, 11.45, Topical Review, 12 Midnight, Chimes, 1.0 to 2.0 a.m. (Friday), Programme in English by the I.B.C.: Popular Concert: Hurricane Harry (Steininger); There's a Cabin in the Pines; Beautiful Spring (Lincke); Somebody stole my Gal (Wood); On the other Side of Love's Lane (Gibbons); Secretly; Roll up the Carpet (Goodhart); Remember my Forgotten Man (Dubin); Two Tickets to Georgia (Young); There's something about a Soldier (Gay); Whistling under the Moon (Ewing); Selection from Viktoria and her Hussar (Abraham); In Santa Lucia (Stransky); A Waltz, A Night, A Tune (Stransky); I'm playing with Fire (Berlin); It's Winter again (Hoffmann), 2.0, I.B.C. Goodnight Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—3.50 p.m., Programme for Children, 4.15, See Prague, 5.5, Talk, 5.15, See Prague, 5.30, German Transmission: Talks: (a) The History of

Art, (b) Radio Novelties, 6.5, Programme to be announced, 6.20, See Prague, 9.50 (approx.), Close Down.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather Forecast, 1.45 p.m., Weather Report, 2.0, Light Music, 3.30, Literary Programme, 4.30, Programme for Young People: Concert and Talk, 5.30, Liszt Concert, conducted by Georg Sebastian, 8.0, News, 8.30, Programme Announcements, 8.55, Chimes from the Red Square, 9.5, Press Review, 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Orchestral Concert, conducted by Erich Kloss; Soloists, Josef Schindler (Tenor), Maetoi (Xylophone), and Hugo Reker (Violin); Xylophone Solos (Schiller): (a) March, Hoch Bayein, (b) Die Rosenlyra; Pieces (Scherber): (a) Japanese Humoresque, (b) Arabesque, (c) Der Grandadglinger; Little Suite (Schlar); Pieces (Larsen): (a) Intermezzo, Lilliput, (b) Clariana, (c) Gavotte; Three Songs from Samoa (Blank); Violin Solos (Maier): (a) Serenade (Maier), (b) Intermezzo (Weikhardt); Waltz, Luscha (Meindl); Raketenwälder (Meindl); March, Abschied (Freitag); Ompetada-Marsch (Fischer-Frank), 4.45, Agricultural Talk, 5.5, Talk, illustrated by Songs to the Lute: Are Folk Songs still made to-day? 5.25, Talk on Anton Bruckner in the Judgment of his Contemporaries, 5.45, Time, Weather and Agricultural Report, 6.0, Transmission for all German Stations, relayed from Stuttgart, 7.0, Zither Concert: March, Hoch die deutsche Zitherschafft (Kutnik); Idylle passionelle (Razigade); Intermezzo, Maurischer Umzug (Rieder); March, Trift gefast (Windisch), 7.20, Programme relayed from Burg Hohenock: Hohenock, an Emblem of Germany's Resurrection, 8.0, Die schöne Galathée—Comie Opera in One Act (Suppé), 9.0, Time and News.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., A Visit to Vienna—Popular Concert by the Station Orchestra, conducted by Kramm, 5.0, German Lesson, 5.30, Divine Service, 6.0, Announcements, Weather, and News, 6.30, Agricultural Programme, 7.0, Time Signal, 7.10, Part-Relay of a Symphony Concert from Copenhagen, 8.20, Announcements, Weather and News, 9.0, Topical Talk, 9.15, Pianoforte Recital by Alexander Borowsky.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Notes, Tourist Talk, Agricultural Notes, and Giornale Radio, 7.20, Gramophone Music, In an interval at 7.30, Time and Announcements, 7.45, Concert of Light Music, 8.30, L'ignota sorgente—Comedy in One Act (Franco Caraci), 9.0 (approx.), Concert (cont'd.), 10.0, Giornale Radio.

**PARIS**

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m., and 10.26 p.m. (Preliminary and 6-dot Signals)—5.45 p.m., Le Journal Parlé, 7.30, Gramophone Concert: Un soir de reveillon (Moretti); Dream Waltz (Joyces); The First Letter (Reggou); In the Temple of the Bells (Yoshitomo); The Druids' Prayer (Dawson); Flottez drapeaux (Paradis), 8.30, Talk: Russian Music before and after the Revolution, relayed from Paris (Radio Colonial), 11,705 kc/s, 25.63 metres, 10.0 (approx.), Close Down.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Records of Richard Tauber: Air from Paganini (Lehár); Two Songs from The Land of Smiles (Lehár); Love Song (Korngold), 7.15, Le Journal Parlé, 7.30, Programme for Children, 8.0, Talk, 8.5, Literary Notes, 8.20, Interval, 8.35, Variety Concert, 9.25, Commentary on a Legal Case, 9.40, Wind Instrument Concert: Divertissement (Bernard); Quintet (Taffanel), 10.40, News.

**PARIS**

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture, 7.30, Weather and Physical Culture, 7.45, Gramophone Music, 8.0, Press Review and Weather, 12 Noon, Protestant Address, 12.30 p.m., Gramophone Concert: Nursey Suite (Inghelbrecht); Das Blümlein (Schumann); Die Spinnerin (Mendelssohn); The Flight of the Bumble Bee (Rimsky-Korsakov); Songs (Daleroue): (a) Le beau bébé, (b) Le mariage du cocou, (c) Kiri-kirigan, (d) La chère maison, (e) Les ramiers; Les réponses de grandmère; Recitations: (a)

Readings from Le Cid (Cornille), (b) L'entant grec (Victor Hugo), (c) Scenes from Hermani (Victor Hugo); Pastiches musicaux (Bétove); Suite Funambulesque (Messager-Salabert). In the interval at 1.0, Exchange, News, and Weather, and at 1.30, Exchange, 2.0, Exchange, 3.45, Exchange and Market Prices, 6.20, Market Prices, Weather, and Agricultural Notes, 6.30, Talk on Cider, 6.45, Legal Talk, 7.0, Talk, 7.20, Gramophone Music: Waltz Potpourri (Berlin); Melody (Lears); Glow-Worm Idyll (Lincke); The Man I love (Gershwin); Stein, Stein, Stein (Cristling-Towers-Valentine), 7.45, German Press Review, 8.0, Popular Concert with Recitations, 8.30, News, Weather, and Sports Notes, 8.40, Talk, 8.45, Dramatic Programme. In the interval at 9.15, Press Review and News.

## PITTSBURGH

**KDKA**, 980 kc/s, 306 metres; 50 kW. Relayed by **W8XK** on 48.86 metres and 25.27 metres.—7.0 p.m., Musical Originalities, from **New York**, 7.30, Pioneers, 7.45, **KDKA** Home Forum, 8.0, Programme to be announced, 8.15, Quilting Party, 8.20, Words and Music, from **New York**, 8.45, Federation of Pennsylvania Women, 9.0, Betty and Bob, from **New York**, 9.15, Thursday Special, from **New York**, 9.30, News and Market Reports, 9.45, Thursday Special, from **New York**, 10.0, Federation Women's Clubs, from **New York**, 10.15, **KDKA** Kids' Klub, 10.30, The Singing Lady, from **New York**, 10.45, Orphan Annie, from **New York**, 11.0, News and Piano Classique, 11.15, Sports Notes, Pat Haley, 11.30, Pittsburgh Spotlights, 11.45, Lowell Thomas, from **New York**, 12 Midnight, Amos 'n' Andy, from **New York**, 12.15 a.m. (Friday), Marvellous Melodies, 12.30, Concert Footlights, from **New York**, 12.45, Pathé News of the Air, 1.0, Captain Diamond, from **New York**, 1.30, Adventures in Health, from **New York**, 1.45, Crooning Choir, 2.0 to 3.30, **New York** Relay, 2.0, Death Valley Days, 2.30, Lady Esther Serenade, 3.0, Hands across the Border.

**PORSGRUND**.—See Oslo.

## POZNAN

896 kc/s, 335 metres; 1.0 kW.—6.5 p.m., Miscellaneous Items, 6.25, See Warsaw, 6.40, Programme Announcements, 6.45, See Warsaw, 7.0, See Warsaw, 9.0, Time and Sports Notes, 9.10, Dance Music from the Polonia Café. In the interval from 10.0 to 10.5, See Warsaw, 10.30 (approx.), Close Down.

## PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Brno, 3.50, See Moravská-Ostrava, 4.15, Economic Talk, 4.25, Gramophone Music, 4.35, French Lesson, 4.50, Gramophone Music, 5.5, Agricultural Report, 5.15, Talk for Workers, 5.25, News in German, 5.30, German Transmission: Agricultural Report and Talk: The Peasant in German Folk Songs, 6.0, Time and News, 6.5, Programme to be announced, 6.20, Talk on the following Transmission, 6.30, The Ghost at the Castle—Comic Opera (Kricka), relayed from the National Theatre, 9.0, Time and News, 9.20, Talk in Czech, French and German on the following Transmission, 9.25, Pianoforte Recital of Smetana's Polkas, by Josef Jiránek, 9.50 (approx.), Close Down.

## RADIO-SUISSE ROMANDE

**SOTTENS**, 743 kc/s, 403 metres; 25 kW.; and **GENEVA**, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics, 11.28, Time Signal from Neuchâtel Observatory, 11.30, News and Weather, 11.40 (from Geneva), Humorous Items, 12 Noon (from Lausanne), Financial Notes, 12.10 p.m. (from Lausanne), Gramophone Concert, 1.0, Interval, 2.58, Time Signal from Neuchâtel Observatory, 3.0 (from Geneva), Concert, 5.0 (from Lausanne), Concert by the Small Station Orchestra, conducted by Moser, 5.30 (from Lausanne), Sports Talk, 5.55 (from Lausanne), Theatre Talk, 6.20 (from Lausanne), Tourist Report, 6.30 (from Lausanne), Talk on Wine, 6.59 (from Lausanne), Weather Report, 7.0, Concert by the Radio-Suisse Romande Orchestra, conducted by Ehenard: Overture, Ali Baba (Cherubini); Suite of Children's Songs (Ingelbrecht); Waltz from The Sleeping Beauty (Tchaikovsky); Selection from La Fête chez Thérèse (Reynald Hahn); Dance Revels (Phillips); Hungarian Songs and Dances (Leopold), 9.0, News and Weather, 9.10 (from Geneva), Talk: The Work of the League of Nations, 9.30 (approx.), Close Down.

## REYKJAVIK

1,200 metres; 21 kW.—8.5 p.m., Musical Programme, 8.30, Weather, 8.40, Musical Programme and Announcements, 9.0, Chimes, and News, 9.30, Reading, 10.0, Music by the Radio Trio, followed by Songs on Gramophone Records.

**RJUKAN**.—See Oslo.

## ROME

Call 190, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.45 p.m., and 2R0, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—11.30 a.m., Gramophone Music, 12

# OCT. 26th THURSDAY continued

**Noon**, Humorous Dialogue, 12.10 p.m., Concert relayed from **Turin**. In the interval at 12.30, Giornale Radio and Exchange, 1.0 to 1.15 (approx.), Time and Announcements, 1.30, Children's Radio Review, 3.50, Giornale Radio and Exchange, 4.0, Reading, 4.10, Weather, 4.15 to 5.0, Vocal and Instrumental Concert; Ornella Pultti-Santoliquido (Pianoforte), Carmen Garcia Cornejo (Soprano), and Luigi Silva (Cello). Part I, Russian Music: Pianoforte Solos: (a) Prelude (Glière), (b) The Lark (Balakirev-Glinka), (c) Gavotte and Melody (Prokofiev), Part II, Peruvian Music: Soprano Solos: (a) Two Songs (Robles), (b) Coconito (Barellata), (c) Boca Loca (Herrera). Part III, Modern Italian Music: Cello Solos: (a) Italian Air (Ferro), (b) Allegretto (Alfano), (c) Tarantella (Casella), 5.40 (Naples), Shipping and Sports Notes, 5.45, Dopolavoro and Tourist Reports, 6.10, Agricultural Notes and Market Report, 6.20, News in Foreign Languages, 6.40, Giornale Radio, 7.0, Time and Announcements, 7.15, Gramophone Music, 7.45, Trio Concert: Trio No. 15 in B Flat (Mozart); Trio (Pizzetti). After the Concert, Announcements, 8.45 (approx.), Nei e cicisbei—Comedy in One Act (Gugliemini), 9.15, Song Recital by Dina Fiumana (Soprano) and Alfredo Sernicoli (Tenor): Two Arias for Soprano from Così fan tutte (Mozart); Tenor Solos: (a) Aria from Falstaff (Verdi), (b) Dormi ancor (Sinigaglia); Soprano Solo: Aria from Giannina e Bernardone (Cimarosa); Duet from Le donne curiose (Wolf-Ferrari), 9.40, Gramophone Music, 10.0, Giornale Radio.

**SALZBURG**.—See Vienna.

## SCHENECTADY

**WGY**, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by **W2XAF** on 31.48 metres, and by **W2XAD** on 19.56 metres.—12.45 a.m. (Friday), Stock Reports, 1.0 to 4.0, **New York** Relay, 1.0, Rudy Valle's Orchestra, 2.0, Captain Henry's Show Boat, 3.0, Al Jolson and Paul Whiteman's Orchestra, 4.0, Programme Résumé.

## SCHWEIZERISCHER LANDESENDER

**BEROMUNSTER**, 653 kc/s, 459 metres; 60 kW.; **Basle**, 1,229 kc/s, 244.1 metres; and **Berne**, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne), Gymnastics, 11.0 (from Zürich), Concert by the Small Station Orchestra, conducted by Scherbaum, 12.25 p.m. (from Zürich), Time, Weather and Exchange, 12.30 (approx.), Interval, 2.30 (from Berne), Folk Music on Gramophone Records, 3.0, See Radio-Suisse Romande, 5.0 (from Basle), Gramophone Concert of Oriental Music, 5.30 (from Basle), Talk: The Chinese Script and Language, 6.0 (from Basle), Time, Weather and Traffic Report, 6.10, Concert by the Radio Orchestra, 6.40 (from Basle), Programme for Women, 7.10 (from Basle), Violin Recital of Swiss Music, 8.0, Weather and News, 8.10 (from Basle), A Radio Play in Dialect, 9.15 (approx.), Close Down.

**SOTTENS**.—See Radio-Suisse Romande.

## STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by **Boden**, 244 kc/s, 1,229.5 metres; **Göteborg**, 932 kc/s, 322 metres; **Hörby**, 1,166 kc/s, 257 metres; **Motala**, 222.5 kc/s, 1,348 metres; **Ostersund**, 389 kc/s, 770 metres; and **Sundsvall**, 554 kc/s, 542 metres.—4.5 p.m. (from Boden), Divine Service, 4.30, Programme for Children, 4.45, Gramophone Music, 5.45, Elementary English Lesson from Jönköping, 1,490 kc/s (201.3 metres), 6.30, Concert by the Radio Choir, 7.0, Talk, 7.45 (from Göteborg), Concert by the Göteborg Chamber Orchestra, conducted by Tor Mann: Three Pieces for Strings: (a) Fantasia (Pachelbel), (b) Plainte (d'Hervelois), (c) Gavotte (Martini); Serenade No. 6 in D for Two Violins, Viola, and Double Bass, with String Orchestra (Mozart); Two Pieces for Strings (Sinigaglia): (a) Rainsong, (b) Etude-Caprice; Five Pieces for Strings, Op. 44, No. 4 (Hindemith); Serenade No. 2 in F for Strings, Op. 63 (Volkmann), 9.0, Talk: Modern Norwegian Lyrics, 9.20, Concert of Chamber Music: Märta Byström (Songs), Janine Moreau (Harp), Gösta Björk (Violin), Karl Achatz (Flute), and Vivan Wennberg (Pianoforte); Violin Solos: (a) Andantino (Martini), (b) Minuet (Porpora), (c) Fugue (Tartini); Three Songs (Haquimus); Flute Solo, Syrinx (Debussy); Harp Solo, La Fille aux cheveux de lin (Debussy); Songs (Seymer); Pieces for Flute and Harp: (a) Pavane (Ravel), (b) The little Shepherd (Debussy), 10.0 (approx.), Close Down.

## STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Concert of Variety Music, 12.45 p.m., News, 1.0, Time and Exchange, 1.5, Orchestral Concert, conducted by Roskam: Two-Step, Je veux (Hollaender); Overture to a Comedy (Kéler-Béla); Foxtrot from Countess Maritza (Kálmán); Waltz (Kozzak); Tango, Por tus ojos negros (Don Aspazu); Selection from The Merry Widow

(Lehár); Here's to the Next Time (Hall); Boston, Betty (Allouche); A petits pas (Sudés); Wouldn't it be Wonderful? (Clarke and Akst); Tango, Tu n'es plus rien (Markush); Two-Step, Carambolino, Caramboletta (Kálmán), 2.0, Programme for Children, 3.0, Interval, 3.45, French Elocution Lesson, 4.0, Programme for Children, relayed from **Bordeaux-Lafayette**, 986 kc/s, 304 metres, 6.0, Talk in German: The French Philosophers, Taine and Comte, 6.15, Talk for Women: Self-confidence, 6.30, Orchestral Concert, conducted by Roskam: Overture, Le cheval de bronze (Auber); Selection from The Bayadere (Kálmán); Waltz, Lieder der Liebesnacht (Lincke); Two Pieces (Gillet): (a) La lettre de Manon, (b) La réponse à Manon; Scandinavian Suite (Frederiksen); Valse caprice (Kalkman); March, Retour à la France (Mezzacapo), 7.30, Time and News, 7.45, Gramophone Music, 8.0, Press Review in German, Lottery Results, and Announcements, 8.30, Chamber Music by the Soudant Quartet: Quartet No. 15 (Mozart); Quartet in D (Borodin); Quartet (Debussy), 10.0 (approx.), Press Review.

## STUTTGART

**MUHLACKER**, 832 kc/s, 360.5 metres; 60 kW. Relayed by **Freiburg**, 527 kc/s, 570 metres.—12.35 p.m., Concert by the Station Orchestra, conducted by Seyfert; Soloist, Käthe Mann (Soprano): Morning, Noon and Night (Suppé); Song from The Bird-Fancier (Zeller); Blumen aus Spanien (Alibout); Waltz Song, Dorfschwalben aus Oesterreich (Jos. Strauss); Stolz Potpourri (Dostal), 2.0, Programme for Children, 3.0, See Langenberg, 5.0, Spanish Lesson, 5.20, Talk: The Soul of the Nation, 5.35, Talk: The History of the Württemberg Army, 5.50, Time, Agricultural Notes and Weather, 6.0, Transmission for all German Stations: Concert by the Municipal Orchestra, relayed from **Karlsruhe**: Symphony in B Flat, Op. 38—the Spring Symphony (Schumann); Sinfonia concertante (Haydn), 7.0, See Frankfurt, 7.10, See Langenberg, 9.0, See Frankfurt, 9.20, Talk: Things you should know... 9.30, News, Weather and Sports Notes, 9.45, Gramophone Music, 10.0, Six Thousand Sparks in Sixty Seconds—Radio Report from the Bosch Works, 10.30, Concert by the Station Orchestra, conducted by Görlich: Overture, Le roi d'Yvetot (Adam); Selection from Firenze ridenta (Raffaelli); Waltz, Am schönen Rhein (Keler Bela), 11.0, See Langenberg, 12 Midnight, Close Down.

**SUNDSVALL**.—See Stockholm.

## TOULOUSE

**RADIOPHONIE DU MIDI**; 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News, 6.15, Music by an Argentine Orchestra, 6.30, Opera Music: Selection from Romeo and Juliet (Gounod); Prelude to Act I of Le Roi malgré lui (Chabrier); Selection from Madame Butterfly (Puccini), 6.45, Balalaika Music and Russian Songs, 7.0, Aeolian Music, 7.15, News, Racing Results, Market Prices, and Exchange, 7.30, Symphonic Poem, L'apprenti Sorcier (Dukas), 7.45, Operetta Music, 8.0, Military Music, 8.15, Concert of Opera Music: Aria from La Favorita (Donizetti); Quand du Seigneur, from La Juive (Halévy); Aria from Lakmé (Delibes); Adieu from Mignon (Thomas); Aria, The Damnation of Faust (Berlioz); Chorus from Carmen (Bizet); Air from The Tales of Hoffmann (Offenbach); The Golden Calf, from Faust (Gounod), 8.45, Light Orchestral Music, 9.0, Extracts from Les Brigands—Operetta (Offenbach), 9.30, Orchestral Music: Toujours ou jamais (Waldteufel); Maundy Thursday in Seville (Turina); Waltz (Thomé), 9.45, Sponsored Concert, 10.15, North African News, 10.30, Programme for Listeners in Morocco, Part I, Sound Film Music, Part II, Hunting Horn Music, 11.0, Tango Songs, 11.15, Dance Music, 12.0 Midnight, News, Weather, and Announcements, 12.5 a.m. (Friday), Light Music, 12.30 (approx.), Close Down.

## TRIESTE

1,211 kc/s, 247.7 metres; 10 kW. 4.10 p.m. till Close Down, See **Turin**.

**TRONDHEIM**.—See Oslo.

## TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by **Milan**, 905 kc/s, 331.5 metres; **Genoa**, 959 kc/s, 312.8 metres; and **Florence**, 599 kc/s, 500.8 metres.—4.10 p.m., Gramophone Concert: Quartet in D (Borodin); Piece (Wieniawsky); Polonaise in E Flat (Chopin); Spanish Caprice (Rimsky-Korsakov), 5.0 to 5.5, Weather, 5.40, Giornale Radio, Dopolavoro Announcements and Gramophone Music, 6.0, Time, Tourist Report, and Gramophone Music, 6.10, Agricultural Notes, Wheat Market Reports, 6.20, News in Foreign Languages, 6.40, Gramophone Music, 7.0, Announcements, Weather, and Gramophone Music, 7.30, A Comedy in Three Acts. After the Comedy, Balalaika Music, relayed from the Cabary,

## VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—11.0 to 11.15 a.m., Religious Information in French, 7.0 to 7.15 p.m., Religious Information in Italian.

## VIENNA

581 kc/s, 517 metres; 100 kW. Relayed by **Graz**, 852 kc/s, 352.1 metres; **Innsbruck**, 1,058 kc/s, 283 metres; **Klagenfurt**, 662 kc/s, 453.2 metres; **Linz**, 1,220 kc/s, 245.9 metres.—10.30 a.m., Concert by the Wiener Symphoniker, conducted by Max Schönherr: Overture, Mam'zelle Nitouche (Ilercv); Ballet égyptien (Luigini); Waltz, Paysage d'autonne (Waldteufel); Serenade (O. Straus); Herbstlied (Konrad); Waldfriede (Konrad); Selection from Die schöne Risetete (Fall); Overture, Herbstmanöver (Kálmán); In the interval at 10.55, Weather, 12 Noon, Time, Weather and Announcements, 12.10 to 1.0 p.m., Gramophone Concert: Nocturne in E Flat, Op. 9, No. 2 (Chopin); Freundschaftliche Vision (R. Strauss); Aria from Turandot (Puccini); Danse exotique (Ilorowitz-Demeny); Aria from Carmen (Bizet); Melody (Cassado); Serenade (Toselli); Sapphische Ode (Brahms); Aria from Tiefland (d'Albert); Aria from Aida (Verdi), 2.0, Time, Weather and Exchange, 2.20, Talk on Poultry-keeping, 2.35, Programme for Children, 3.0, Concert: Alexander Wunderer (Oboe), Hedwig Kraussler (Violin), and Charles Cerné (Pianoforte), Concerto (Bach); Sonata (Telemann), 3.45, An interview with Erdberg, 4.5, Talk for Women, 4.25, Ballet, The Seasons (Glazunov), on Gramophone Records, 5.0, Talk on Domestic Heating, 5.25, Talk: The Social Question in Conservative Austria, 5.50, Talk on Wireless, 6.0, Theatre Talk, 6.5, Military Band Concert, March, Oesterreichs Hort (Bela von Ujj); Waltz, Bei uns z'haus (Jon. Strauss); Festival Overture (Hübli); Schmettleringmarsch from Der Schmettlering (Weinberger); Selection from The Bird Fancier (Zeller); Drumt in der Lobau (Stolze); Kamerad, wir sind die Jugend (Stolz); Waltz, Dorfkind (Kálmán); March Alt Starnberg (Schneider); Selection from The Merry Widow (Lehár); March, Soldatenlieder (Thann), in the interval at 6.35, Time, Weather and Programme Announcements, 7.15, Topical Talk, 7.30, Rome—a Sequence (Lola Lorme), 8.30, News, 8.45, Talk in Esperanto: The National Theatre in Vienna, 9.0, Concert Relay, Part I—From the Lehár Hall, Part II—From the Hotel Kranz-Ambassador. After the Concert, Announcements.

## WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow, 11.5, Pianoforte Recital of Polish Music on Gramophone Records, 11.30, Radio Journal, 11.38, Concert of Polish Music for Schools by the Philharmonic Orchestra, with Introductory Talk: Soloists: Mme. Gadejska (Songs), Tawrosiewicz (Violin), 1.0, Interval, 2.30, Talk on Economics, 2.40, Concert of Chamber Music: Selection from The Blue Mazurka (Lehár); Se tu m'ami (Denza); Ballet Suite (Armandola); Les loutains (Waldteufel); Canzonetta (Rence); Schön Rosmarin (Kreisler), 3.40, Programme for Women, 3.55, Classical Music from the Sixteenth to the Twentieth Century, by the Station Symphony Orchestra with Introductory Talk: Soloist: Lenezwaska-Slawinska (Mezzo-Soprano); Overture, Roland (Lully); Concerto grosso in D minor (Handel); Aria from Castor et Pollux (Rameau); Aria from the St. Matthew Passion (Bach); Orchestral Suite in B minor (Bach), 4.50, Agricultural Notes, 5.0, Talk on Economics, 5.20, Dramatic Programme, 6.5, Miscellaneous Items, 6.25, Topical Talk, 6.40, Radio Journal, 7.0, Johann Strauss Concert by the Station Symphony Orchestra, conducted by Oziminski: Soloist: Szelemuska (Soprano); March from Der lustige Krieg; Waltz; Selection from Eine Naecht in Venedig; Airs and Cards from Die Fledermaus; Polka, Postillon d'amour; Quadrille; Selection from The Gipsy Baron; Polka-Mazurka; Gallop; Song from The Gipsy Baron; Ballet Music from Die Fledermaus; Perpetuum mobile; Waltz; Persian March. In an interval at 8.0, Answers to Correspondence, 9.0, Sports Notes, 9.10, Dance Music relayed from the Café Adria, 10.0, Aviation Weather Report and Police Notes, 10.5, Dance Music (contd.).

## WILNO

533 kc/s, 563 metres; 16 kW.—6.5 p.m., Answers to Correspondents, 6.25, See Warsaw, 6.40, Programme Announcements, 6.45, See Warsaw, 7.0, Request Gramophone Records, 8.0, Programme from Warsaw.

## ZAGREB

977 kc/s, 307 metres; 0.75 kW.—4.0 to 5.30 p.m., Concert by the Station Orchestra, 6.30, Announcements, 7.0, Concert of French Music, 8.30, Viktor Kosica Concert; Soloist: The Composer (Cello), 9.0, News, Weather and Programme Announcements, 9.15, Dance Music, 10.0 (approx.), Close Down.

**ZÜRICH**.—See Schweizerischer Landessender.

# FRIDAY

## OCTOBER THE TWENTY-SEVENTH

### ALGIERS

824 kc/s, 364 metres; 13 kW.—7.20 p.m., Agricultural Talk. 7.35, Aria Recital: Duet from Lakmé (Delibes); Prayer from Tosca (Puccini); Aria from Werther (Massenet); Aria from Sigurd (Reyer); Monologue from Hamlet (Thomas). 7.55, News. 8.0, Time and Lottery Results. 8.10, Symphony Concert by the Augmented Station Orchestra, conducted by Henry Defosse: The Jupiter Symphony (Mozart); Ballet Music from Les deux pigeons (Messager); Violin Concerto in A (Mozart); March from Tannhäuser (Wagner). In the interval at 8.45, News, and 8.50, Recitations. 9.30, News. 9.35, Instrumental Solos.

### ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations and Gramophone Concert. 6.0, Programme for Children. 6.45, News. 7.0, Gardening Talk. 7.15, John Stephens' Poems by Mrs. E. V. Fleming Moran. 7.30, Time Signal. 7.31, Bach Concert. Soloists: Grace O'Brien (Pianoforte), Eleanor Miley and Lorna Thompson (Pianoforte and Violin), and Margaret Dempsey (Soprano). 8.30, Concert by the Strabane Prize Song and Chorus Troupe. In an interval at 8.50, Orchestral Music. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Concert: Selection from The Desert Song (Romberg); The Dancing Doll (Poldini); Song: I sigh no more (Aitken); Poème (Fibich); Angel's Serenade (Braga); Spanish Gipsy Dance (Marquina); Song: Until (Sanderson); Waltz, The Blue Danube (Johann Strauss); Wireless World Announcement. 10.0, Concert arranged by the International Broadcasting Company (Ireland) on behalf of the Irish Hospitals' Sweepstakes Authorities: The Gold-diggers' Song (Warren); Are you sure you love me; I've got to pass your house to get to my house; Racing Commentary; Gipsy Fiddle; Carolina Lullaby; Trouble in Paradise; Can't we meet again. 10.30, I.B.C. Goodnight Melody, followed by News and Weather. 10.40, Gaelic Programme. 11.0 (approx.), Close Down.

### BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Selection from Tristan and Isolde (Wagner); Italian Serenade (Holmes); Solveig's Song (Grieg); Intermezzo (Demare); Selection from Samson and Delilah (Saint-Saëns); Romance without words (von Goëns); Selection from Lakmé (Delibes). 7.0, Request Gramophone Records. In the interval at 7.30, Exchange. 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Messages to Seamen, Exchange, and Market Prices. 9.10, Concert by the Station Orchestra: March, Imperial Edward (Sousa); Selection from Noche de Reyes (Serrano); Salut d'Amour (Elgar); Violin Solo: Romance (Calvo); Prelude in C Sharp minor (Rachmaninov); Overture, The Bohemian Girl (Balfe). 10.0, Recitation of Poems. 10.15, An Opera on Gramophone Records. In the interval at 11.0, News. 12 Midnight (approx.), Close Down.

### BARI

1,112 kc/s, 269.8 metres; 20 kW.—3.30 p.m., Gramophone Music. 3.55 to 5.35, See Rome. 5.35, News in Albanian. 5.45 till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

### BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—7.0 p.m., Concert by the Station Quartet. 7.35, Pianoforte Recital. 8.15, Recital of Arias from Opera. 9.0, Time and News, followed by Cigany Music relayed from the Ratnicki Dom Restaurant. 9.45, Dance Music on Gramophone Records.

### BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—1.0 p.m., Music from Sound Films on Gramophone Records. 2.0, Talk for Girls. 2.30, Weather and Exchange. 2.45, Reading. 3.0, See Leipzig. 4.0, Talk: Education for Citizenship. 4.25, The Great City—Radio Picture (Gerda v. Below) with Music by Ludwig Hess. The Station Chamber Music Orchestra, conducted by the Composer, and Soloists. 5.0, Poems. 5.5, Talk: Children and the State. 5.25, Spanish Lesson. 5.45, Weather and News. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, To-day's Motto. 7.5, Das Schweineschlauchen—A Peasant Comedy (Hinrichs). 8.20, Violin Recital by Hans Rohr; Concerto in A Minor (Vivaldi); Concerto in D (Mozart). 9.0, Weather, News and Sports Notes. 9.15, Discussion: Aerial Traffic. 9.45, Weather. 10.0, Concert from Langenberg. 11.0 (approx.), Close Down.

### BERLIN

FUNKSTUNDE, 715 kc/s, 419.5 metres; 1.5 kW.—6.0 p.m., Transmission for all German Stations, relayed from Leipzig. 7.5, Folk Songs (on Gramophone Records). 7.40, Folk Customs—Radio Report. 8.0, A Visit with the Microphone to a Violin Maker's. 8.20, North and South—Humorous Programme with Songs. 9.0, Weather and News. 9.15 (ap-

prox.). Dance Music by the Wilfried Krüger Band, relayed from the Traube Restaurant. In an interval at 10.0 (approx.), Theatre and Film Review. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

### BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.35, News. 7.40, Film Review. 7.55, Lottery Results. 8.0, Spanish Lesson. 8.15, News. 8.30, Concert.

### BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—6.10 p.m., Concert by the Station Orchestra. 6.40, See Prague. 9.30 (approx.), Close Down.

BREMEN.—See Hamburg.

### BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.5 p.m., Gramophone Concert of Classical Music. 12.54, Time and News. 1.10, Schubert and Schumann Song Recital by Elfriede Nöldner (Soprano). 1.40, Programme arranged by the Post Office, with Gramophone Records. 2.0, Agricultural Prices. 2.15, Talk for Young People: The Struggle for Upper Silesia. 2.40, Talk: Some Nationalist German Writers. 3.0, Concert by the Station Orchestra, conducted by Ernst Topitz. 4.30, Agricultural Prices. 4.35 (approx.), Fritz Woike, the Silesian Worker Poet, reads from his own works. 5.0, Programme to be announced. 5.30, Talk: The History and Character of the Silesian People. 5.50, Market Prices. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, News. 7.10, Concert by the Silesian Philharmonic Orchestra and the Frohe Meistersinger. Conductor: Ernest Topitz. Overture, Tantalusquale (Suppé); Italian Suite No. 2 (Bece); Humoresque (Humperdinck); Idyll (Kaun); Liebeslieder-Walzer Op. 52 (Brahms); Four Old German Folk Songs (arr. Hering): (a) Des Morgens in der Früh, (b) Nun ade du mein lieb Heimatland, (c) Ach wie ist's möglich dann, (d) Rosestock, holder blüht; Intermezzo from Cinderella (Joh. Strauss); The Nutcracker Suite (Tchaikovsky); Five Popular Songs (arr. Hering): (a) Ja, so ein Mädel wie Du, (b) Ich komme wann du willst, (c) Ich träume so gern, (d) Wenn die Sonne scheint, (e) Ja, so ein Glaser! von besten Wein; Weindusel (Tautenhayn); Freikorps-Marsch (Müllbecke). 9.0, Time and News. 9.25, Talk: The Mystery of the Death Rays. 9.40, Light Music on Gramophone Records. 11.0 (approx.), Close Down.

### BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission; News, Sports Notes and Topical Talks. 6.0, See Prague. 6.10, See Bratislava. 6.40, See Prague. 9.15 (approx.), Close Down.

### BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Famous Voices on Gramophone Records. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Leeman: Overture, The Bohemian Girl (Balfe); Berceuse (Goeyens); Selection from Rigolotto (Verdi); Minuet from the Cello Concerto (Saint-Saëns); Slav Rhapsody (Friedemann); International Suite (Tchaikovsky). 5.0, Concert of French Music by the Radio Orchestra, conducted by Franz André: Indian March (Sellenick); Overture, Cigale et Mialle (Casadesu); Selection from Gretchen Green (Giraud); Symphonie Poem, Le rouet d'Omphale (Saint-Saëns); Suite pour mes petits amis (Pierne); Ballet Music from The Cid (Massenet). 6.0, Talk on the Exchange. 6.15, Request Gramophone Music. 6.30, Pianoforte Recital by Mlle. Gérardy Thérèse: Valse caprice (Rubinstein); Le rappel des oiseaux (Rameau); Gnomesreigen (Liszt). 6.50, Concert by the Small Station Orchestra, conducted by Leeman: Overture, Le Muletier (Hérold); Suite of Dances, Songs of Spain (Albeniz); Violin Solo: Elégie (Delcroix); Two Pieces (Ellenberg). 7.15, Talk. 7.30, Legal and Literary Talks. 8.0, Programme for Ex-Servicemen—Addresses, Songs and Monologues. 9.0, Concert by the Radio Orchestra, conducted by André. Soloist: Lagarde (Violin). Une marche (Walpot); Overture, Die Fledermaus (Joh. Strauss); Waltz, Mon rêve (Waldteufel); Suppé Potpourri (Beethoven); Violin Solos: (a) Romance (Beethoven), (b) Rondo brillant (Wieniawski), (c) Mazurka (Zarzycki); Waltz, Dans l'azur (Paradis); Extracts from La Féria (Lacôme). 10.0, Le Journal Parlé. 10.10, La Brabançonne.

### BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—12 Noon, Concert by the Small Station Orchestra, conducted by Leeman: Two Step, Puerta de la carne (Luchesi); Suite Saharienne (Ackermans); Rustle of Spring (Sinding); Selection from Thaïs (Massenet); Violin Solos: Popular Spanish Songs (Fallá); Valse des fleurs (Tchaikovsky); Italian Song Potpourri, Le canzoni d'Italia (de Micheli); Selection from Ciboulette (Hahn). 1.0 p.m., Le Journal Parlé. 1.10, Gramophone Concert of Variety Music. 5.0, Concert by the Station Symphony Orchestra, conducted by Meulemans: Overture, Der Bärenhäuter (Siegfried Wagner); Siegfried Idyll (Wagner); Breton Rhapsody (Saint-Saëns); Queen Anne Minuet from Henry VIII (Saint-Saëns); Intermezzo (Candael); Waltz, Hesitation (Colwery); Recuerdos de viaje (Albeniz). 6.0, Gramophone Music. 6.15, Talk. 6.30, Jef von Hoof Song Recital by Feremans. 6.55, Gramophone Music: Sinfonia (Bach); Scherzo and Finale from the Third Symphony (Beethoven); Elegiac Melody No. 1 (Grieg). 7.30, Wireless Talk. 8.0, Benoit Concert by the Station Symphony Orchestra, conducted by Meulemans: Overture to and Waltz from Charlotte Corday; Flute and Orchestra; Symphonie Poem; Fantasia No. 3. 8.45, Centrale Ilier—Radio Play (Anne Tölle-Honekamp), translated from the German. 9.15, The Battle of the Yser—Anniversary Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans: Jour des Morts from Triptyque (Blockx); March from Klokke Roeland (Tinel); In Memoriam (Mortelmans); Feestklanken (Verkeyden). In the interval, Talk: The Battle of the Yser, October 25-30, 1914. 10.0, Le Journal Parlé.

### BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Dance Music by the Cîna Jazz Band. In an interval at 5.0, Radio Journal. 6.0, Educational Programme. In an interval at 6.20, Gramophone Music. 7.0, Song Recital by Alice Nicolae. 7.20, Spring and Autumn—Concert by the Station Orchestra: Waltz, Frühlingsstimmen (Strauss); Spring Song (Mendelssohn); Chanson du printemps (Gounod); Fête du printemps (Thomas); Sigmond greets the Spring Night from The Valkyries (Wagner); Waltz, Herbstrosen (Jos. Strauss); Autumn Twilight (Alessandrescu). Concert Overture. In Herbst (Grieg). In an interval at 8.0, Talk. 8.45, Radio Journal.

### BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 6.30 p.m. till Close Down.—4.30 p.m., Gramophone Concert. 5.0, Political Review. 5.55, Talk: The Venice of the East. 6.30, Relay from the Royal Hungarian Opera House. News in the interval. After the Programme. Dance Music and Cigany Music from the Café Ostend; Soloist, Paul Kalmár (Songs).

CASSEL.—See Frankfurt.

### COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall. 11.2, Concert by the Leonard Gyldmark String Ensemble, relayed from the Bellevue Strandhotel. 1.0, Interval. 1.40, Pianoforte Recital by Gladys Olsson. Fantasia Impromptu in C Sharp Minor (Chopin); Norwegian Bridal Procession (Grieg); Prelude in A Minor (Debussy); Rhapsody in C (Dohnanyi). 2.0, Concert by the Teddy Petersen Orchestra, relayed from the Wivex Restaurant. 4.0, Reading. 4.30, Exchange and Fish Market Prices. 4.45, Literary Talk. 5.15, Elementary German Lesson. 5.45, Weather. 5.54, Announcements. 6.0, News. 6.15, Time Signal. 6.30, Talk: Different Credit Systems. 7.0, Time Signal from the Town Hall. 7.1, Programme by Per Knutzon. 7.10, English Song Recital by Vera Nielsen. Pleading (Elgar); The Daffodils (Easthope Martin); Forest Scene (Austin); Don't come in, Sir, Please (Cyril Scott). 7.20, Joan of Arc—Play in Four Acts (Bernard Shaw), Danish Translation by Julius Clausen. 9.10, News. 9.25, Chamber Music, Simon Goldberg (Violin), Paul Hindemith (Viola), and Emanuel Feuermann (Cello). Trio in E Flat, Op. 3 (Beethoven); Divertimento in C for Violin, Viola and Cello (Haydn). 1.0 (approx.), Close Down.

CORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

### FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 to 12 Noon, Programme in English by the I.B.C. Happy Hour. Part I: Orchestral Music: Signature Tune; Overture, Figaro (Mozart); Valse bluette (Drigo); Invitation to the

Waltz (Weber); Violin Solo: Tambourin chinois (Kreisler); Pizzicato from Sylvia (Delibes); Ich liebe dich (Grieg); September Waltz (Godin); Humoresque (Dvořák). Part II: Dance Music: Tick, Tock, You're an old Smoothie; My Lucky Day; Aloha, oe! I'll take an option on you; Lover's Lane; Five Fifteen; I've got to pass your house to get to my house (Brown); Signature Tune. 12 Noon, French Programme. 4.30 to 6.0 p.m., Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Gramophone Concert for Southampton and Winchester Listeners: Signature Tune: The Night by the Sea; My Heart stood still (Rodgers); Since you went away (Johnston); Selection from Hold my Hand (Gay); One Little Hair on his Head (Casting); Xylophone Solo: Dance of the Paper Dolls (Tucker); Meadow Lark (Florito); Destiny Waltz (Baynes); Everybody Loves my Baby (Palmer). 5.30, Orchestral Concert for Bourne-mouth and Weymouth Listeners: Waltz, Gold and Silver (Lehar); The Boys of the Old Brigade (Barri); Die Spieluhr des Pompadours (Noack); Fairy Tale (Hecyken); Cuban Serenade (Herbert); Oriental Serenade (Herbert); Pianoforte Solo: Romanian Air (Holbrook); The Song of the Nightingale (Ailbrot); Selection from The Student Prince (Romberg); Signature Tune. 6.0, Programme in French. 10.0 till Close Down, Programme in English by the I.B.C. 10.0 (approx.), Dance Music: Signature Tune: Bells of Normandy; Sweetheart Darlin'; Twelfth Street Rag; A Girl like Nina; Wood Violets; Peter, Peter; It was a Night in June; Happy Ending; I always keep my Girl out late; Lazy-bones; Wedding of the Dragon Flies; Don't blame me; Whistling under the Moon; Sweet Dreams Pretty Lady; Carry me back to green, green pastures; Cornflowers and Poppies; My lucky Day; I'll show you off; Signature Tune. 11.0, Tunes from the Talkies: Signature Tune; Sittin' in the Dark; In the Park in Patee (Woods); There'll still be love (Posford); With you here, and me here (Eytton); Selection from The Kid from Spain (Ruby); Old Spotted Cow (Stanley); Pianoforte Selections from Forty-second Street (Dubin); I've got to pass your house to get to my house (Brown); Twentieth Century Blues (Coward); Signature Tune. 11.30, Club Concert for Westminster and Wilton Listeners. Part I: Choral Music: Signature Tune: The Chum Song; Orchestra: Suite, Americana (Thurhan); Selection from La pouce (Andran); Mighty lak' a Rose (L'utsam); Orchestra: Waltz, Donauwellen (Novonovic); Humorous Medley; Swing low sweet Chariot; All God's Chillun' got wings; Selection from Waltzes from Vienna (Strauss-Griffiths); O who will o'er the Downs so free (de Pearsall). 12.5 a.m. (Saturday), I.B.C. News Bulletin in English. 12.10 (approx.), Club Concert. Part II: Hello (Redman); Steamboat Bill (Lighton); Hoho, you can't ride this Train (Armstrong); Give me a Tune (Scott); Nine Little Miles from Ten, Ten, Tennessee (Sherman); Signature Tune. 12.30, Dance Music: Louisville Lady; My Wishing Song; Isn't this a Night for Love; Lover; Egypt; Isn't this Heavenly; Flor de Cuba; My Moonlight Madonna. 1.0, Dance Music: Signature Tune: Bells of Normandy; Avalon; I bring a Song; P.C. 129; Let's call it a Day; Let the world go drifting by; Ding, Dong, Ding; Oh! Johanna; Smidown in a Little Green Hollow; I can't remember; Dance pretty Lady; Sing another line; Tick, Tock; Aloha, oe!; Lover's Lane; Mademoiselle; Happy as the Day is long; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

### FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35, See Langenberg. 1.30, Talk for the Housewife. 2.0, Talk: The German Girl Student as Wife. 2.30, Weather. 2.40, Time and Economic Notes. 3.0 to 5.20, See Langenberg. 5.20, Achim von Ackermann reads from his own Poems. 5.35, Talk: The German Salesman under the New Regime. 5.50, News. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, Topical Talk. 7.10, Radio Report on the German Amateur Wireless Service. 7.35, Concert of Light Music. 8.30, Talk on the Eiffel Plateau. 9.0, Time and News. 9.20, See Stuttgart. 9.30, News. 9.45, See Langenberg. 11.15 (also relayed on Zeesen, 31.38 metres). Talk: The German Character and Intellect. 11.45 (approx.), Close Down.

FREDRIKSSTAD.—See Oslo.

FREIBURG.—See Stuttgart.

GENEVA.—See Radio-Suisse Romande.

GENOA.—See Turin.

GLEIWITZ.—See Breslau.

GOTEBERG.—See Stockholm.

GRAZ.—See Vienna.

HAMAR.—See Oslo.

### HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; and Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 556 metres; and Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m., Transmission for all Ger-

OCT. 27th **FRIDAY** continued

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, Financial Notes, Exchange, Racing Results and News. 8.10, Esperanto Lesson. 8.30, Radio Concert. In the interval at 9.0, News and Weather.

**KALUNDBORG**.—See Copenhagen.

**KIEL**.—See Hamburg.

**KLAGENFURT**.—See Vienna.

**KOSICE**.—See Prague.

**LAHTI**

157 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—4.0 (from Helsinki), Orchestral Concert. 4.30, Recitation. 5.15, Talk. 5.40 (from Helsinki), 'Cello Sonata (Kaski). 6.0, Dramatic Programme. 6.30 (from Helsinki), Orchestral Concert. 7.45, News in Finnish. 8.0, News in Swedish.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—12.35 p.m., Concert by the Station Orchestra, conducted by Göhre. 1.30, A Radio Report of a Visit to the Municipal Archives of Warendorf, Westphalia. 1.45, Concert of Chamber Music. 2.5, Talk: Nature's Time for Sleep. 2.30, Economic Notes. 2.50, Topical Talk. 3.0, Concert by the Station Orchestra, conducted by Kühn; Soloists, Erdmuche Fiebiger (Contralto) and Robert Grote ('Cello). 5.0, English Lesson. 5.20, Talk on Genealogy. 5.35, Programme for the Ninetieth Birthday of Ferdinand Krüger, the Westphalian Dialect Author. 5.50, News. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0 to 9.20, See Frankfurt. 9.20, See Stuttgart. 9.30, News and Weather. 9.45, Concert by the Station Orchestra, conducted by Kühn; Soloist, Rudi Rhein (Violin): Prelude, Mein Vaterland (Erlrich); Romance for Violin (Wagner-Wilhelmi); German Dances (Haydn); Serenade, Einsame Feldwacht (Graener); Ballet Music (Glazunov); Bavarian Dances (Elgar); Waltz, Herbstrosen (Strauss). 11.15, See Frankfurt. 11.45 (approx.), Close Down.

**LAUSANNE**.—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m., Weather and Time. 11.5, Concert by the Emde Orchestra: March, Sonnenader (Blankenburg); Overture, The Hermit's Bell (Mailart); Waltz, Was der Wald erzählt (Zimmer); Serenata Nostalgia (Marazita); Potpourri, Boccaccio Galanteren (Suppe); Wenginger; Intermezzo (Ganglberger); Swedish Sketches (Torsten); Waltz, Die Daine in braun (Robrecht); Potpourri of German Folk Songs (Fetras); March Intermezzo, Der Zirkus kommt (Rust); Waltz, Intermezzo, Annäherung (Weinroth); Liebeslied (Andersch); Czardas (Andersch); Prelude, Chorus, Ballad and Dance from Das Pensionat (Suppe); Descriptive Piece, Spatenpromenade (Egg); Waltz from Der Juxhonor (Kollo); Song, Mein Moselland (Meyer-Stolzenau); Intermezzo, Schattenspiele (Fink); Carinthian March Song (Wenzel). In the interval at 12.15 p.m., News and Programme Announcements. 1.15 News. 1.30, Review of the Day. 1.40, Nazi Songs on Gramophone Records. 2.15, Talk for the Country Housewife. 2.35, Economic Notes. 3.0, Concert by the Station Orchestra, conducted by Blumer. Soloist: Ruth Meister (Violin). Overture, The Barber of Seville (Rossini); Five Oriental Sketches (Mracek); Waltz, Red Roses (Lehar); Selection from The Jewels of the Madonna (Wolf-Ferrari); Mazurka brillante (Liszt); Overture, Il Seraglio (Mozart); Violin Concerto in C (Haydn). 4.30, Book Review—Austria, 1683-1933. 4.50, Economic Notes, News, Weather and Time. 5.0, Young People before the Microphone. 5.20, Gramophone Music. 5.40, Talk: Art produced by Workers. 5.50, Review of the Day. 6.0, Transmission for all German Stations. Concert by the Symphony Orchestra, conducted by Blumer. Soloists: Elizabeth Meinel (Soprano), Carl Bartuzat (Flute), and Theodor Blumer (Pianoforte). Commentary by Hans Freyberg, Dornröschen Suite for Orchestra Op. 12 (Kienzl); Six Songs for Soprano and Pianoforte Op. 78 (Regger): (a) Klein Marie, (b) Zwei Mädchen, (c) Maria Wiegendorf, (d) Das Brüderchen, (e) Das Schwesterchen, (f) Mausefängen; Five Pieces from the Album for the Young Op. 68 (Schumann): (a) Kleiner Morgenwandler, (b) Fröhlicher Landmann, (c) Schmetterliedchen, (d) Armes Waisenkind, (e) Mai, Lieber Mai, bald bist du wieder da; Selection from Musikalische Hans-und Lebensiegel (Schumann); Two Pieces for Flute and Pianoforte Op. 57b (Blumer): (a) Das Mädchen vom Himmelssüssel, (b) Die Winde; Children's Songs: (a) Kindchen tanzt (Frey), (b) Frau Hölle (Frey), (c) Abendgebet (Bezold), (d) Im Frühling (Knab), (e) Pusstemuhme (Knab), (f) Aurikeichen (Knab); Selection from Hansel and Gretel (Humperdynek). 7.0, The Bohemian Forest—Literary and Musical

Programme from the Works of Adalbert Stifter, Hans Watzlik and Josef Magnus Wehner (arr. Watzlik). 8.0, Programme to be announced. 9.0, News and Sports Notes. 10.0, Concert of Contemporary Music by the Leipzig Symphony Orchestra, conducted by Steffen: Concertino for Two Flutes and String (Hoyer); Chamber Symphony for Thirteen Solo Instruments (Kirchner). 11.0 (approx.), Close Down.

**LINZ**.—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Talk for Sokols. 6.30, Excursions for Sunday. 7.0, Programme from Zagreb, 977 kc/s, 307 metres. 9.0, Time, News, and Dance Music. 10.0 (approx.), Close Down.

**LUXEMBOURG**

252 kc/s, 1,191 metres; 200 kW.—Dutch Eveuing. 7.0, Symphony Music on Gramophone Records: Symphony No. 1 in C, Op. 21 (Beethoven); Overture, Anacraon (Cherubini). 7.45, Concert by the Radio Orchestra, conducted by Henri Pensis. Soloist: Dodja Feldin ('Cello). 'Cello Concerto (Haydn); Scheherazade (Rimsky-Korsakov). 8.50, News in French. 9.0, Concert by the Radio Orchestra: Overture, Der Waffenschmied (Lortzing); Waltz (Königsberger); Elegy (Rachmaninov); Suite variée (Pierné). 9.30, Gramophone Music. 9.45, News in German. 9.55, Gramophone Music: Overture, Les Dragons de Villars (Mailart); Diversissement for Viola da Gamba and Cembalo (Haydn); Norwegian Dance No. 4 (Grieg); Selection from L'Africaine (Meyerbeer). 10.20, Dance Music by the Radio Jazz Band.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—6.15 p.m., Radio Journal. 7.30, Gramophone Music. 7.40, Radio Gazette for Lyons and the South-East. 8.30, Orchestral Concert.

**MADRID**

ARANJUEZ (EAO), 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Concert of Light Music. In the interval at 10.45, Radio Notes. 11.35, Answers to Correspondence. 11.40, Spanish American Talk. 11.45, Light Music. 12 Midnight to 12.30 a.m., Programme in English by the I.B.C.: Volga; Hot Feet; Hawaiian Sweetheart of Mine; Speak Easy; The Blue Danube; Aloha Oe!; Bidin' my Time; A Penny for your Thoughts. 12.30, I.B.C. Goodnight Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Topical Review and Request Gramophone Records. 8.15, Radio Journal. 8.30 to 9.30, Interval. 9.30, Chimes, Time and Topical Review. 9.45 (approx.), Tristan and Isolde—Opera (Wagner), on Gramophone Records. 11.45, Topical Review and Programme Announcements for Listeners Abroad. 12 Midnight, Chimes and Close Down.

**MALMO**.—See Stockholm.

**MILAN**.—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Plichta: Overture, Luisa Miller (Verdi); Three Pieces from the Suite, Impressions d'Italie (Chaprentier); Gavotte (Jirak); Two Pieces (Sebestik); Polka from Schwanda the Piper (Weinberger). 3.50, Talk. 4.0, See Prague. 5.5, Tourist Report. 5.15, See Prague. 6.10, See Bratislava. 6.40, See Prague. 9.30 (approx.), Close Down.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather. 1.45 p.m., Weather Report. 2.0, Programme of New Soviet Literature and Music. 3.30, Programme of Modern Literature. 4.30, Talk: New Developments in Science and Technics. 6.30, Dramatic Programme. 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

**MOTALA**.—See Stockholm.

**MUHLACKER**.—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 560 metres.—4.45 p.m., Talk for the Younger Generation: Equality of Rights or Chivalry between the Sexes? 5.5, Gottes Lob aus Kindermund, Op. 25 (Philipp) by a Girls' Choir. Soloists: Elizabeth von Pander (Mezzo-Soprano) and Oskar von Pander (Pianoforte). 5.25, Talk: The Laws of Nature and Procreation. 5.45, Time and Announcements. 6.0, Transmission for all German Stations relayed from Leipzig. 7.0, Brother Abaldus—Drama in Three Acts (Franz Kranewitter). 7.50, Concert by the Station Orchestra, conducted by Winter.

man Stations, relayed from Leipzig. 7.0, Dat Babbellus—Dialect Play in Three Acts (Thomas Westerich). 8.0, (from Hanover), Friedrich Silcher Concert, by the Silcher Society Double Quartet, and the Station Orchestra. Soloist: Lantelme (Songs). Conductor: von Sosen. Festival Overture on the Song, 'Ueb' immer Treu und Redlichkeit (Hartung); Quartet: (a) Werbung, (b) Die drei Röslein; Two Songs: (a) 's Blümlin, (b) Liebeschmerz; German Folk Melodies; Double Quartet: (a) O wie herbe ist das Scheiden, (b) Nun lch wohl, du kleine Gasse, (c) Der Soldat; Songs: (a) Liebesspiel, (b) Das Gedanken, (c) Ade! Waltz, Bei uns zu Hause (Job. Strauss). 9.0, News. 9.20, Concert by the Small Station Orchestra, conducted by Adolf Secker. Overture to a Hungarian Comedy (Kéler-Béla); Selection from Liselott (Künneke); Two Pieces (de Micheli); (a) Spanish Serenade, (b) Song without Words, Scheherazade (Schmalstich); Einsame Nacht (Clemus); Waltz, The Wedding of the Winds (Hall); Overture, Wiener Frauen (Lehar) Valse trieste (Sibelius); Two Pieces (Murzilli): (a) Fascinata, (b) Melody Selection from Der Obersteiger (Zeller); March, The Cadets (Souza).

**HANOVER**.—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Sound Film Music and Operetta Music on Gramophone Records. In the intervals at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.15, Programme for Children. 2.30, Discussion for Women: Kriemhild and Brunnhild through Modern Eyes. 3.0, Concert by the Small Station Orchestra, conducted by Wilcken: March, Vivat Hungaria (Lincke); Suite Goliardica (Amadei); Romanesque Fantasia (Zikov); Overture, Raymond (Thomas); Waltz, Gold and Silver (Lehar); Selection from Halka (Moniusko); Asiatic Suite (Yoshitomo); Overture, Lestocq (Auber); Waltz, España (Waldteufel). In the interval at 3.50 (approx.), Review of Political Books. 4.50, Talk on Forestry. 5.15, Agricultural Prices. 5.25 (from Danzig), Humorous Programme. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0, News and Weather. 7.10, Humorous Programme on Gramophone Records. 7.50, Concert by the Königsberg Opera House Orchestra, conducted by Wolfgang Brückner: Symphonic Poem, La mer (Debussy); Symphonic Poem, Death and Transfiguration (R. Strauss). 9.0, News, Weather and Sports Notes.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m., and 20 kW. from 5.40 p.m.—11.40 a.m. to 3.40 p.m., Programme of the General Broadcasting Company (A.V.R.O.). 11.40, Time Signal. 11.41, Concert of Light Music by the Rentmeester Orchestra. 1.55, Gramophone Music. 2.10, Talk: Fruit Growing. 2.40, Gramophone Music. 3.40 to 7.40, Programme to be announced. 7.40 to 10.40 (approx.), Programme of the Liberal Protestant Radio Society (V.P.R.O.). 7.40, Time and Religious Address. 8.10, Concert. 8.40, Talk. 9.10, Concert (contd.). 9.40, News. 9.55, Reading. 10.25, Gramophone Music. 10.40 (approx.), Programme to be announced.

**HORBY**.—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. until 3.40 p.m. Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—Programme of the Christian Radio Society (N.C.R.V.). 11.40 a.m., Police Notes. 11.55, Gramophone Music. 12.10 p.m., Concert by the v.d. Horst Ensemble: Overture, Maritana (Wallace); Waltz, Paysage d'Automne (Waldteufel); Selection from La Navarraise (Massenet); Torna a Sorriento (de Curtis); Selection from the Maid of the Black Forest (Jessel). Gramophone Records: Overture, Light Cavalry (Suppe); Riedolfsklänge (Jos. Strauss); Il Natale di Pierrot (Monti); Selection from Cavalleria rusticana (Mascagni). 1.40, Gramophone Records. 2.10, Religious Reading. 2.40, Song Recital by Pielstroom (Baritone): Aria from St. Paul (Mendelssohn); Sei still (Raff); Die Ehre Gottes aus der Natur (Beethoven); Pianoforte Solo: Impromptu Op. 90, No. 4 (Schubert); Malia (Tosti); Malgré Moi (Tosti). Gramophone Records: Haarlem Song (Andriessen); De wiegende mijnerker (Hullebroeck). 3.25, Interval. 3.40, Gramophone Music. 3.55, Chamber Music for Flute, Oboe Clarinet and Pianoforte. 5.40, Gramophone Music. 6.10, Horticultural Talk. 6.40, Police Notes. 6.55, Religious News. 7.10, Literary Talk. 7.40, Orchestral Concert, conducted by v.d. Hurk; Sursum Corda (Ruh); Potpourri of Children's Songs (Ruh); Brüder seht die Bundesfahne (Müller); Hymn (Rosmalen); Potpourri of Alpine Songs (Ruh); N.C.R.V. Song. Gramophone Records: Schlaf wohl (Abt); Melody (H. Weber); Adagio religioso (Bohm); Intermezzo religioso (Franck); Prelude (Rachmaninov); Révêrie and du Soir Marche militaire from the Suite algérienne (Saint-Saëns); Selection from Rigoletto (Verdi); Violin Concerto in A (Mozart); Symphony in B flat (Schubert); Overture, Obcron (Weber). In the interval at 8.40, Talk, and at 9.40 (approx.), Press Review. 10.40, Gramophone Music. 11.10 (approx.), Close Down.

**INNSBRUCK**.—See Vienna.

Soloist: Enrico Mainardi ('Cello). In the interval, Political Announcements. 9.0, Time and News.

**NAPLES**.—See Rome.

**NOTODDEN**.—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Mamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Popular Concert. 5.0, French Lesson. 5.30, Talk. 6.0, Announcements, Weather and News. 6.30, English Lesson. 7.0, Time Signal. 7.1, Symphony Concert, conducted by Hilding Rosenberg: Partita for String Orchestra, Harpischord and Oboe (Roman); Suite, The Marionettes (Rosenberg); Two Romances Op. 28, for Violin and Orchestra (Stenhammer); Symphony in E flat (Berwald). 8.30, Agricultural Report. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Recitations.

**OSTERSUND**.—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Notes, Tourist Talk, Agricultural Notes, Report of the Royal Geographical Society and Giornale Radio. 7.20, Gramophone Music. In an interval at 7.30, Time and Announcements. 7.45, Concert of Opera Music. In the intervals, Talk and Announcements. 10.0, Giornale Radio.

**PARIS**

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,655 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals).—5.45 p.m., Le Journal Parlé. 7.30, Concert. 8.0, News and Talk on Politics. 8.15, Orchestral Concert, conducted by Flamant: Peacock Pie (Gibbs); (a) The Huntsmen, (b) The Sunken Garden; Selection from Il Trovatore (Verdi); Violin Solo, Noche de Arabia (Arbos); 'Cello Solo, Amour d'antan (Chausson); Moonlight on the Alster (Fetras). 9.0 (approx.), Close Down.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Music. 7.5, Talk. 7.15, Le Journal Parlé. 7.30, Esquisses (Arthur Willner), by Edouard Gendron (Pianoforte). 7.50, Weekly Review. 7.55, Agricultural Talk. 8.0, Talk on Music. 8.10, Interval. 8.30, Tip-Toes—Operetta (Gershwin). In the interval, Commentary on a Law Suit. 10.30, News.

**PARIS**

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture (contd.). 7.45, Gramophone Records: Romance in F (Cools); La plus belle (Darlay); Prelude (Denyn); Tes Yeux (Bonincontro). 8.0, Press Review and Weather. 12 Noon, Jewish Address. 12.30 p.m., Gramophone Concert: Air (Curti); Hawaii (Cazes); Love Waltz (Heymann); Il faut bien se faire une Santé (Chepfer); Bambola mia (Padilla Vanner); Melody (Erwin); Round the Mill (Feret); Doucement (Bertal-Maubon); Air (Mitchell); La Cancaïaise (Anignon); Le Moulin de Maître Jean (Borel-Clerc); Fascination (Marchetti); The Singer of Seville (Lonelly); Selection from The Land of Smiles (Lehar); Melody (Jessel); Comme autrefois (Scotti); Girl of my Dreams (Clapp); Sans rien dire (Legay); Sicilian Waltz (Fietter); La Ronde nocturne (Dani); Georgina (Bracale); Petite Suite de Concert (Coleridge-Taylor); Rhapsody on Old Limousin Aires (Rouchard). In the intervals at 1.0 p.m., Exchange, News and Weather, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 4.30, Elementary English Lesson. 6.20, Market Prices. 6.30, Talk on Flowering Plants. 6.50, Review of Social Insurance. 7.0, Talk: The Modern French Novel. 7.20, Gramophone Concert: Under the Double-Headed Eagle (J. F. Wagner); Con Fuego (Curti); Souvenir (Drda); Rigaudon (Lacôme); Miami (Learsi); Joujou (Fyscher); Christia (Gottler); Jack Baby (Loyraux). 7.45, Market Prices and News. 8.0, Reading of Contemporary Novels. 8.30, News and Weather. 8.40, Gastronomic Review. 8.45, La Course du Flambeau—Play (Hervieu). In the interval at 9.15, Press Review and News.

**PITTSBURGH**

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.86 metres and 25.27 metres.—4.0 to 5.0 p.m., U.S. Marine Band, from New York. 7.0, Musical Originalities, from New York. 7.30, KDKA Home Forum. 8.0, Programme to be announced. 8.15 to 9.30, New York Relay. 8.15, Utility Hall. 8.30, Words and Music. 8.45, Morin Sisters. 9.0, Betty and Bob. 9.15, Gene Quaw's Orchestra. 9.30, News and Market Prices. 9.45, Arcadians, from New York. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, Press News-Reader. 11.15, Sports Notes, Pat Haley. 11.30, Pittsburgh Spotlights. 11.45, Lowell Thomas, from New York. 12 Midnight, Amos 'n' Andy, from New York. 12.15 a.m. (Saturday) Silver Toppers. 12.30 to 1.30, New York Relay. 12.30, Circus Days. 12.45, Variety Programme. 1.0, Popular Pro-

gramme. 1.30, Potash and Perlhutter. 1.45, Red Davis. 2.0, Let's listen to Harris. 2.30, Variety Programme. 3.0, First Nighter. **PORSGRUND.**—See Oslo.

**POZNAN**

896 kc/s, 335 metres; 1.9 kW.—6.5 p.m., Miscellaneous Items. 6.20, Talk: Where shall we go Sunday? 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 6.55 to 7.0, Interval. 7.0 to 9.40, See Warsaw. 9.40, Time and Sports Notes. 9.50, Dance Music. In the interval from 10.0 to 10.5, See Warsaw. 10.30 (approx.), Close Down.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Moravská-Ostrava. 3.50, Talk. 4.0, Memorial Programme relayed from the Vysehrad Cemetery. 4.45, Gramophone Music. 5.5, Agricultural Report. 5.15, Talk for Workers. 5.30, News in German. 5.35, German Transmission: Talk on National History and National Character. 6.0, Time and News. 6.10, See Bratislava. 6.40, Czech Cantata (Smetana) for Mixed Choir and Orchestra, relayed from the Municipal Theatre, Cheb. 7.0, Talk. 7.15, Concert by the Station Orchestra, conducted by Parik; Festival Overture, Op. 70 (Foerster); To the Unknown Soldier (Hanonsek); Symphonic Poem, Op. 111 (Dvorak); Slav Caprice, Op. 6 (Karel); Hussite Overture (Dvorak); Recitations in the interval. 8.30, A Play. 9.0, Time and News. 9.15, Russian News. 9.30 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**SOTTENS,** 743 kc/s, 403 metres; 250 kW.; and **Geneva,** 395 kc/s, 760 metres.—6.0 to 6.11 a.m. (from Lausanne). Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Concert by the Small Station Orchestra, conducted by Moser. 12 Noon (from Lausanne), Financial Notes. 12.10 p.m. (from Lausanne), Concert (contd.). 1.0, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0, See Schweizerischer Landessender. 5.0 (from Geneva), Programme for Women. 5.30 (from Geneva), Esperanto Lesson. 5.40 (from Geneva), English Lesson. 6.5 (from Geneva), Talk on Bridge. 6.20 (from Geneva), Talk on Chess. 6.35 (from Geneva), Talk and Gramophone Records. 6.59 (from Geneva), Weather Report. 7.0 (from Geneva), Reading from Hans Andersen's Fairy Tales. 7.15 (from Geneva), Dance Suite (Dalerose), by the Klein String Quartet. 7.45 (from Geneva), Review of the Week. 8.0 (from Geneva), Variety Concert by the Melody Dance Orchestra. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

**REYKJAVIK**

1,200 metres; 21 kW.—8.5 p.m., Musical Programme. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, Chimes and News. 9.30, By the Fireside.

**RIGA**

572 kc/s, 525 metres; 15 kW.—6.5 p.m., Symphony Concert: Suite from Der Geburtstag der Infantin (Schrecker); Pianoforte Concerto in C Minor (Rachmaninov); Symphony No. 1 (Vitolins). In the interval at 7.0, News. 8.0, Weather and News. 8.20, Operetta Music on Gramophone Records. **RJUKAN.**—See Oslo.

**ROME**

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relay by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.15 p.m. (approx.), and 2RO, 11,810 kc/s, 25.4 metres from 4.15 p.m.—12 Noon, Orchestral Concert. In the interval at 12.30 p.m., Giornale Radio and Exchange. 1.0 to 1.15 (approx.), Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15 to 5.0, Vocal and Instrumental Concert, Mario Ceccarelli (Pianoforte), Guglielmo Castella (Baritone) and Maria Senes (Soprano). Pianoforte Solos: (a) Prelude from the Suite bergamasque (Debussy). (b) Improvisation in C sharp minor (Chopin); Baritone Solos: (a) Air from The Puritans (Bellini). (b) Air from Thais (Massenet); Soprano Solos: (a) Aria from Turandot (Puccini). (b) Nina querida (Buzzi-Peccia); Two Waltzes (Schubert-Friedemann); Soprano Solos: (a) Aria from La vedova scaltra (Wolf-Ferrari). (b) Two Popular Spanish Songs; Baritone Solo: Aria from Carmen (Bizet). 5.30, Religious Address. 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopolavoro Notes and Tourist Report. 5.57, Report of the International Institute of Agriculture (in Spanish, German and French). 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time, Announcements and Sports Notes. 7.15, Sponsored Programme. 8.15, Programme to be announced. 9.30, Dance Music. 10.0, Giornale Radio. **SALZBURG.**—See Vienna.

**SCHENECTADY**

WGY, 790 kc/s, 379.5 metres; 50 kW. Relay at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—7.30 to 8.30 p.m., New York Relay. 7.30,

OCT. 27th

**FRIDAY**

continued

Echoes of Erin. 7.45, Sonata Recital. 8.0, Three Shades of Blue. 8.15, Soloist. 12.45 a.m. (Saturday), Stock Reports. 1.0, Popular Programme, from New York. 1.30, Popular Programme. 2.0 to 4.0, New York Relay. 2.0, Fred Allen and Ferde Grofe's Orchestra. 2.30, Orchestral Programme. 3.0, First Nighters in a Sketch. 3.30, Lum and Abner's Friday Night Sociable. 4.0, Programme Résumé.

**SCHWEIZERISCHER LANDESENDER**

**BEROMUNSTER,** 653 kc/s, 459 metres; 60 kW.; **Basle,** 1,229 kc/s, 244.1 metres; and **Berne,** 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne). Gymnastics. 11.0 (from Basle), Gramophone Concert. 11.29, Time Signal from Neuchâtel Observatory, Weather, and News. 11.40 (from Basle), Concert (contd.). 12.25 a.m. (from Basle), Time, Weather, and Exchange. 12.35 (approx.) to 2.30, Interval. 2.30 (from Zürich), Gramophone Concert. 3.0 (from Zürich), Orchestral Concert. 4.0, Gramophone Music. 4.10, Concert by the Small Station Orchestra, conducted by Scherbaum. 5.0 (from Zürich), Programme for Children. 5.30 (from Berne), Talk: Hermann Hesse and Switzerland. 6.0 (from Berne), Time, Weather, Market Prices, Tourist Talk, and Sports Notes. 6.20 (from Berne), Swiss Folk Songs. 6.50 (from Berne), Talk: The Heroic sagas of Scandinavia and the William Tell Legends of Switzerland. 7.20, Popular Swiss Music. 7.35 (from Berne), Before the Thirty Years' War—Reading from the Contemporary Manuscripts. 7.45, Variety Concert by the Radio Orchestra. 8.0, Weather and News. 8.10 (from Berne), Elga—Play (Gerhard Hauptmann). 9.40 (approx.), Close Down.

**SOTTENS.**—See Radio-Suisse Romande.

**STOCKHOLM**

669 kc/s, 436 metres; 55 kW. Relay by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres;

Rosamunde (Schubert); Prelude to Le Déluge (Saint-Saëns); Violin Solo: Berceuse for Cello and Orchestra (Faure); Pianoforte Solo; Jardins sous la pluie (Debussy); The Golliwog's Cake Walk (Debussy). 6.0, Trio Concert, relayed from Lille, 1,130 kc/s, 265.4 metres. 7.0, Topical Talk in German. 7.15, Tourist Talk. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German and Lottery Results. 8.30, Orchestral Concert, conducted by Roskam; Soloist: Vally Fiori (Songs); Overture, Titus (Mozart); Song, Adelaide (Beethoven); Minuet (Schubert); Aria from Rigoletto (Verdi); Intermezzo from L'Arlesienne (Bizet); Saxophone Solo; Aria from Madame Butterfly (Puccini); Aria from The Tales of Hoffmann (Offenbach); Dance Suite for Flute, Oboe, and String Quintet (Klaas); Two Step (Lucchesi); Kaiser-Walzer (Strauss); J'ai pleuré en rêve (Hue); Lever d'aube (Ropartz); Selection from François les bas-bleus (Messager); Fox Trot, Golden Sands (Greer and Klages); Tango (Bazant); Man trägt rot wenn man verliebt ist (Mann and Weiss); Boston; I wake up smiling (Leslie and Ahlert); Violin Solo; Foxtrot Song, Dream Sweetheart (Green); March, Partons ensemble (Erwin). In the interval at 9.30 (approx.), Press Review in French. 10.30 (approx.), Close Down.

**STUTTGART**

**MUHLACKER,** 832 kc/s, 360.5 metres; 60 kW. Relay by Freiburg, 527 kc/s, 570 metres.—12.35 p.m., See Langenberg. 2.0, Talk: Excursions for Sunday. 2.15, Concert of Chamber Music: Sonata in F for Cello and Pianoforte (de Feltz); Sonata for Two Violins, Cello and Pianoforte (Corelli); Sonata for Two Violins and Pianoforte (Handel). 3.0 to 5.35, See Langenberg. 5.35, Talk: The Police Court Doctor. 5.50, Time, Agricultural Notes and Weather. 6.0, Transmission for all German Stations, relayed from Leipzig. 7.0 to 9.20, See Frankfurt. 9.20, Talk: Things you should know. . . 9.30, News, Weather and Sports Notes. 9.45 (from Freiburg), Review of

After the Concert, Bal Muzette Music. 11.0, Light Music. 11.15, Dance Music. 12 Mid-night, News, Weather and Announcements. 12.5 a.m. (Saturday), Opera Music: Air from Lakmé (Delibes); O Rosalinde from Manon (Massenet); Air from La Bohème (Puccini); Aria from Resurrection (Alfano). 12.15, Orchestral Music: Plaisir d'amour (Martini); Serenade (Tereghigh); St. Louis Blues (Handy). 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m., Pianoforte and Song Recital by Carmela Montagna-Pecorari (Pianoforte), and Gemma Baruch (Mezzo-Soprano); Pianoforte Solos: (a) Improvisations (Boschi). (b) Melody (Lebail); Mezzo-Soprano Solos: (a) Marnach (R. Strauss). (b) Traum durch die Dämmerung (R. Strauss). (c) Im Frühling (Wolf); Pianoforte Solos: (a) An dem Frühling (Liszt). (b) Jeux d'eau à la Villa d'Este (Liszt); Mezzo-Soprano Solos: (a) The Poet's Song (Marx). (b) Piccina, piercino (Castellonovo-Tedesco). (c) Secchi e pierlecci (Castellonovo-Tedesco). 5.0 till Close Down, See Turin.

**TRONDHEIM.**—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relay by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Concert of Chamber Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolavoro Announcements and Gramophone Music. 6.0, Time, Report of the Royal Geographical Society and Gramophone Music. 6.10, Agricultural Notes and Wheat Market Reports. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, Giornale Radio and Weather. 7.15, Sponsored Music. 7.30, Variety Programme. In the interval: Talk. 9.0, Programme to be announced. 10.0, Giornale Radio

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15, Religious Information in German. 7.0 to 7.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relay by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m., Orchestral Concert, conducted by André Hummer. 12 Noon, Time and News. 12.10 p.m., Classical Music on Gramophone Records. 1.0, Interval. 2.0, Time and Announcements. 2.20, Talk on Landscape Photography—A Walk in Vienna. 2.35, Programme for Young People. 3.0, Gramophone Concert: Duet from Der Bettelstudent (Müllöcker); Torna a Sorriento (Curtis); Selection from Die Fledermaus (Joh. Strauss). 3.20, Talk on Animals. 3.40, Reading (Hans Karg-Hebenburg and Franz Zernoffta), with Introductory Talk. 4.20, Song and Aria Recital by Nectar von Flander (Soprano) and Richard Kubla (Tenor). 5.0, Tourist Report. 5.15, Sports Notes. 5.25, Talk. 5.50, Time and Announcements. 6.0, Music from Indigo—Operetta (Joh. Strauss), by the Station Choir and Orchestra, with Humorous Commentary by Leo Slezak. 8.15, Topical Talk. 8.30, News. 8.45, Pianoforte Recital by Julius Isserlis; Symphonic Etudes (Schumann); Barcarolle (Chopin); Tarantella, Venezia e Napoli (Liszt). 9.45, Dance Music by Claire Hege-düs and his Band, relayed from the Café Palmhof. After the Programme, Announcements.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Orchestral Concert, relayed from Cracow, 959 kc/s, 312.8 metres. In an interval at 11.30, Radio Journal and Weather Report. 12 Noon, Interval. 2.30 p.m., Economic Notes. 2.40, News. 2.45, Scout Report. 2.50, Maritime and Colonial Notes. 2.55, String Quartet in B Flat, Op. 130 (Beethoven), on Gramophone Records, with Introductory Talk. 3.40, Book Review. 3.55, Song Recital. 4.25, Tenor Solos, relayed from Poznan, 896 kc/s, 335 metres. 4.50, Talk. 5.0, Talk: Poland To-day. 5.20, Light Music relayed from the Adria Café. 6.5, Miscellaneous Items. 6.20, Hints for the Week-end. 6.25, Reading. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, on Music. 7.15, Symphony Concert by the Philharmonic Orchestra, conducted by Jirak. Soloist: Piatigorski ('Cello'). In the interval at 8.0, Reading. 9.40, Sports Notes. 9.50, Dance Music, relayed from the Café Adria. 10.0, Aviation Weather Report and Police Notes. 10.5, Dance Music (contd.).

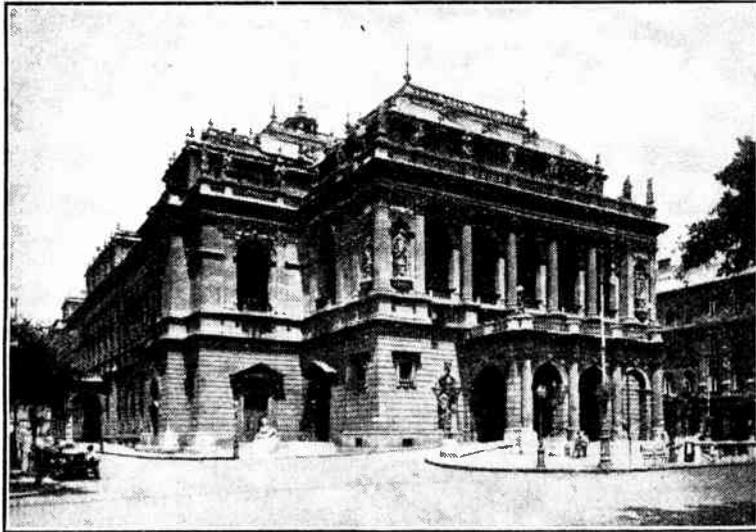
**WILNO**

533 kc/s, 563 metres; 16 kW.—6.20 p.m., Miscellaneous Items. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45 till Close Down, See Warsaw.

**ZAGREB**

977 kc/s, 307 metres; 0.75 kW.—4.0 to 5.30 p.m.: Trio Concert. 6.5, Talk. 6.15, Sports Notes. 6.30, Miscellaneous Announcements. 7.3 to 9.0, Concert relayed from Belgrade, 697 kc/s, 430.4 metres. 9.0, News, Weather and Programme Announcements. 9.15, Dance Music Relay. 10.0 (approx.), Close Down.

**ZURICH.**—See Schweizerischer Landessender.



THE ROYAL OPERA HOUSE, Budapest, from which the Hungarian Broadcasting Company regularly relays performances.

Ostersund, 289 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—12 Noon (from Göteborg), Broadcast for Schools. 4.5 p.m. (from Sundsvall), Programme for Children. 4.35, Gramophone Music. 5.30, Reading. 6.0, Song Recital by Nils Svanfeldt. 6.30, Talk relayed from Malmö, 1,301 kc/s, 231 metres. 7.0, Concert by the Station Orchestra, conducted by Adolf Wiklund; Soloist, Sabine Meyen (Songs); Symphony No. 3 in E Flat (Haydn); Songs (Mozart): (a) Aria from The Magic Flute. (b) Aria from Idomeno. (c) Aria from Il Seraglio; Air for Strings (Handel); Scherzo (Mendelssohn); Rhapsody (Lindberg); Songs: (a) Aria from Romeo and Juliet (Gounod). (b) Aria from Dinorah (Meyerbeer). (c) Waltz Song, Frühlingsstimmen (Joh. Strauss). 8.15, Talk. 9.0 (from Göteborg), The Practical Corner. 9.15 (from Göteborg), Concert by Wertheimer's Viennese Orchestra. 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Music. 12.45 p.m., News. 1.0, Time Signal. 1.1, Gramophone Music. 4.45, Talk: Michelet's History of France. 5.0, Orchestral Concert, conducted by Roskam; Turkish March (Mozart); Ochsennuett (Haydn); Gavotte from the Concerto in D (Handel); Overture, Iphigenia in Aulis (Gluck); Spring Song (Mendelssohn); Abendlied (Schumann); Ballet Music from

the Theatre. 10.0, Concert from Langenberg. 11.15, See Frankfurt. 11.45 (approx.), Close Down.

**SUNDSVALL.**—See Stockholm.

**TOULOUSE**

**RADIOPHONIE DU MIDI,** 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Music by an Argentine Orchestra. 6.30, Songs. 6.45, Military Music. 7.0, Medical Talk. 7.10, Sound-Film Music. 7.15, News, Racing Results and Commercial Prices. 7.30, Scènes pittoresques (Massenet). 7.45, Opera Music: Melody from Grisélidis (Massenet); Aria from Lohengrin (Wagner); Trio from Faust (Gounod); Slowly Daylight Fades, from Prince Igor (Borodin). 8.0, Orchestral Music. 8.15, Accordion Music. 8.30, Arias from Opera: Melodies from (a) Manon (Massenet). (b) The Barber of Seville (Rossini). (c) Sophie Arnould (Pierné). (d) Fortunio (Messager). 8.45, Viennese Music. 9.0, Scenes from Hamlet—Tragedy (Shakespeare). 9.45, Orchestral Music: Wedding Procession (Rimsky-Korsakov); In a Persian Market (Ketelbey); March (Drantzen); Selection from The Mikado (Sullivan). 10.0, Chansonnettes. 10.15, North-African News. 10.30, Concert for Listeners in Morocco: Selection from the Gipsy Princess (Kálmán); Selection from Ciboulette (Hahn); Extracts from Enlevez-moi (Gabatoche).

**SATURDAY**  
OCTOBER THE TWENTY-EIGHTH

**ALGIERS**

824 kc/s, 364 metres; 18 kW.—7.20 p.m., Songs, 7.55, News, 8.0, Time and Lottery Results, 8.10, Concert of Czech Music for the Fifteenth Anniversary of the Czech Republic by the Augmented Station Orchestra, with an Introductory Talk: Polouaise (Dvorak); Vltava (Smetana); Un soir d'été (Fibich); Carnival (Fibich); Musique du soir (Foerster); Utonulá (Krizkowsky); Melody (Smetana); Popular Slav Song (Pokorny); My Country (Smetana). In an interval at 8.45, News, 9.30, News, 9.35, Recitations, 9.55, News.

**ATHLONE**

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations and Gramophone Concert, 6.0, Gramophone Concert, 6.45, News, 7.0, Talk, 7.15, Gaelic Talk, 7.30, Time Signal, 7.31, Orchestral Concert by the Dublin Philharmonic Society. Soloist: William Murdoch (Pianoforte), 9.30 to 10.30, Programme in English by the I.B.C. (Ireland), Ltd., 9.30, Concert of Light Music: The Skaters' Waltz (Waldteufel); Banjo Solo: March, Rugby Parade (Oakley); Spanish Sweetheart (Hargreaves); Song: Smilin' through (Penn), 9.45, Dance Music: I've got to pass your house to get to my house; I've got to sing a Torch Song; Gipsy Fiddle; Sophisticated Lady, 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Sweepstake Authorities: Six or Seven Times; Under a Blanket of Blue; Remember my forgotten Man; Racing Commentary; Black Rhythm; I couldn't tell them what to do; Looking Forward; Smoke Rings, 10.30, I.B.C. Good-night Melody, followed by News and Weather, 10.40, Traditional Music, 11.0 (approx.), Close Down.

**BARCELONA**

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert, Minuet from the Symphony in G minor (Mozart); Melody (Wagner); Bagatelle (Alday); Selection from Ariana (Massenet); Air de ballet (de Taeye); Plaisir d'amour (Martini); Selection from Mignon (Thomas), 7.0, Request Gramophone Records, In the interval at 7.30, Exchange, 8.0, Gramophone Music, 8.15, Anti-War Talk, Gramophone Music and News, 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices, 9.5, Educational Programme, 9.35, Concert by the Station Orchestra, Hungarian Dance No. 7 (Brahms); Serenade from Don Giovanni (Mozart); Slav Dance (Glazunov); Polonaise in D minor (Schubert), 10.0, Astronomy Talk, 10.15, Dance Music relayed from the Casa Llibre, In the interval at 11.0, News, 12 Midnight (approx.), Close Down.

**BARI**

1,112 kc/s, 269.8 metres; 20 kW.—11.30 a.m., Quintet Concert: Pattuglia azzurra (D'Anzi); Waltz Serenade (Sadun); Selection from Le Roi de Lahore (Massenet); Gavotte (Fliege); Era una bambola (Melocchi); Il negro (Borghesano), 12 Noon to 3.30, See Rome, 3.30, Programme for Children, 3.55 to 5.35, See Rome, 5.35, News in Albanian, 5.45 till Close Down, See Rome.

**BASLE.**—See Schweizerischer Landessender.

**BELGRADE**

697 kc/s, 433.4 metres; 2.8 kW.—6.0 p.m., Violin Recital of Czechoslovak Music, 6.40, Talk, 6.45 (approx.), See Prague, 8.0, Time and News, followed by Dance Music, relayed from the Auto Club.

**BERLIN**

**DEUTSCHLANDSENDER (REICHSENDER),** 183.5 kc/s, 1,635 metres; 60 kW.—1.0 p.m., Gramophone Music, 1.45, Programme for Young People, 2.0, Hand-work for Children, 2.30, Weather and Exchange, 2.45, Reading (Frensen), 3.0, See Hamburg, 4.0, Review of the Week's Sport, 4.20, Concert by the Willi Glabe Orchestra, with Jean Adam (Siffleur) and Hans Rappal (Zither), 5.20, Week-End Programme, 5.45, Weather and News, 6.0, Transmission for all German Stations, relayed from Breslau, 7.0, Today's Motto, 7.5, Vintage Festival on the Rhine—Variety Programme, 9.0, Weather, News and Sports Notes, 9.45, Weather, 10.0, See Munich, In the interval at 11.0, Talk.

**BERLIN**

**FUNKSTUNDE,** 715 kc/s, 419.5 metres; 1.5 kW.—3.0 p.m., See Heilsberg, In an interval at 4.0 (approx.), Sports Notes, 4.30, Weekly Sound News Report, 5.0, Pianoforte Recital by Fritz Malaku; Ballad (Grieg); Wilhelm-Raabe-Musik, Op. 58 (Graener), 5.20, Talk: Women and Children, 5.30, The Funkstunde informs its Listeners, 5.45, Topical Talk, 6.0, Transmission for all German Stations, relayed from Breslau, 7.5, The German Rhine—Musical Radio Picture (Marc Roland), by the Station Orchestra and Choir, conducted by the Composer, 8.0, The Rhine—A Musical Vintage Festival, In an interval at 9.0 (approx.), News, and at

10.0, Topical Talk, 12 Midnight (approx.), Close Down.

**BERNE.**—See Schweizerischer Landessender.

**BEROMUNSTER.**—See Schweizerischer Landessender.

**BODEN.**—See Stockholm.

**BODO.**—See Oslo.

**BORDEAUX-LAFAYETTE**

986 kc/s, 304 metres; 18 kW.—7.0 p.m., Radio Journal, 7.55, Sports Talk, 8.0, News, Racing Results and Market Prices, 8.5, English Lesson, 8.20, News, 8.30, Variety Programme.

**BREMEN.**—See Hamburg.

**BRESLAU**

523 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.5 p.m., Gramophone Concert, 12.45, Time and News, 1.10, Gramophone Concert, 1.30, Programme arranged by the Post Office with Gramophone Records, 2.0, Agricultural Prices, 2.15, Review of Books on the Labour Question, 2.35, Programme to be announced, 2.55, Film Review, 3.10, Concert by the Kurt Sparmann Orchestra, relayed from the Kaffee Vaterland, 5.0, Programme Announcements for the Coming Week, 5.10, Readings (Leonhard Hora and Ernst Schenke), 5.30, Programme to be announced, 6.0, Transmission for all German Stations: Programme in Memory of the Aviator Oswald Boelcke (killed October, 1916), with Music by the Silesian Philharmonic Orchestra, 7.0, Concert by the Silesian Philharmonic Orchestra, conducted by Gerhard Ewald Fischka: Overture, Manfred (Schumann); Siegfried-Idyll (Wagner); Festival Overture (Lassen); Intermezzo from Das Hofkonzert (Scheinpflug); Selection from Die Wunderrosen (Rischka), 8.0, News, 8.10, Concert by the Station Orchestra, conducted by Ernst Topitz: Soloist: Hellmut Hallendorf (Tenor); Overture, Lachendes Leben (Rust); Waltz, Diesen Kuss der ganzen Welt (Ziehrer); Intermezzo, Lachende Welt (Siede); Song, Ich hab ihn Paradies geschaut (Suppe); Wie ist das Leben schön (Flemming); Song from Frasquita (Lohar); Waltz, Wine, Woman and Song (Joh. Strauss); March, Till Eulenspiegel (Kupprecht); Lustig gelebt (Lincke); Song from Hannerl (Schubert-Laditte); Wenn die Nacht kommt (Bromme); Potpourri, Liebe, Lust und Leben (Ischpold); March, Flott durch die Welt (Haupt), 9.30, Time and News, 9.55, Dance Music by the Station Band, conducted by Topitz, 12 Midnight (approx.), Close Down.

**BRNO**

878 kc/s, 342 metres; 35 kW.—5.0 p.m., German Transmission: Music by German Composers by F. Weisz and B. Weigl (Songs) and J. Wikina (Pianoforte), 6.0, See Moravska-Ostrava, 6.45, See Prague, 10.30, Talk in Esperanto, 10.45 (approx.), Close Down.

**BRUSSELS (No. 1)**

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans: Overture, Orpheus in the Underworld (Offenbach); Scene and Waltz from Gretina Green (Guiraud); Pourquoi (Langlois); Selection from Pas sur la Bouche (Yvain), Piccolo Solo: L'oiseau tapageur (Balleron); Selection from Werther (Massenet), Gramophone Records: Two Airs from Die Fledermaus (Joh. Strauss); Padilla Potpourri (Salabert), 1.0 p.m., Le Journal Parlé, 1.10, Concert by Mickey's Club Jazz Attraction, 4.45, Talk: The Fourteenth Conference of the League of Nations, 5.0, Gramophone Records: Quartet in D (Franck); Spanish Caprice (Rimsky-Korsakov), 6.0, Talk: The Youth of Alessandro Farnese, 6.15, Gramophone Records: Larghetto (Handel); Miroir (Bernier); Le Blé est blond (Bernier); Navarra (Albeniz); Overture, Norma (Bellini), 6.30, Concert by the Small Station Orchestra, conducted by Leemans. Soloist: Douliez (Pianoforte); March, Entry of the Gladiators (Fucik); Ballet Suite, La Source (Delibes); Old Spanish Song (Aubert); Russian Dance (Tchaikovsky); Potpourri, From Gluck to Wagner (Schreiner), Pianoforte Solo: Hungarian Rhapsody No. 12 (Liszt); Danse des Elfes (Henriques); Selection from The Grand Duchess of Gerolstein (Offenbach); Spanish Dances (Laparra), 7.30, Wireless Review, 8.0, Peer Gynt—Drama in Five Acts (Ibsen) with Music by Grieg, 10.0, Le Journal Parlé.

**BRUSSELS (No. 2)**

I.N.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—12 Noon, Concert by

Mickey's Club Jazz Attraction, 1.0 p.m., Le Journal Parlé, 1.10, Concert by the Small Station Orchestra, conducted by Leemans: Siamesische Wachtparade (Lincke); Overture, Les Dragons de Villars (Maillart); Waltz, Florida (Novuo); Selection from The Geisha (Jones); Cossack Song (Czeruik), Gramophone Records: Notturmo d'amore (Drigo); Serenade (Toselli); Selection from The Vagabond King (Primi), 5.0, Dance Music, relayed from the St. Sauveur Palais de Danse, 6.15, Talk: Interior Naviguion in Belgium, 6.30, Gramophone Records: Overture, Alessandro Stradella (Flotow); 'Cello Concerto, Op. 33 (Saint-Saëns); Scherzo from L'apprenti sorcier (Dukas), 7.15, Talk, 7.30, Film Review, 8.0, The Flying Dutchman—Opera (Wagner), relayed from the Royal Flemish Opera House, Antwerp, In the interval at 8.55, Recitation (Timmermans), and at 10.15, Gramophone Records, 11.5, Le Journal Parlé.

**BUCHAREST**

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra: Ballet Overture (Lincke); Medieval Suite (Amadei); Selection from Frülling im Wienerwalde (Ascher); La claca (Paschill); Potpourri of Russian Songs and Dances (Salinsky); Polka des mandolines (Desormes); Song Potpourri (Dostal), In an interval at 5.0, Radio Journal, 6.0, Educational Talk, 6.20, Gramophone Music, 6.40, Talk, 7.0, Pianoforte Quartet (Chausson), 7.30, Talk, 7.45, Recital of Modern Music on Two Pianofortes, 8.15, Musical Saw Recital, 8.45, Radio Journal, 9.0, Romanian Music by the Station Orchestra.

**BUDAPEST**

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres.—4.0 p.m., Cigány Music, 5.15, Answers to Correspondence, 5.45, Report on the Budapest Gymnastic Society's Display, relayed from the Sportplatz, 6.15, Concert of Operetta Music by the Concert Orchestra, conducted by Vaszy; Soloists, Margarete Nagy and Alexander Pusztay, 7.45, News and Racing Results, 8.0, Bunter Abend, 9.0, Weather, 10.0, Gramophone Concert.

**CASSEL.**—See Frankfurt.

**COPENHAGEN**

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall, 11.15, Broadcast for Schools, 11.45, Concert by the Bendix String Ensemble, relayed from the Wivex Restaurant, 1.0, Interval, 1.30, Gramophone Concert of Variety Music, 2.0, Programme for Children, 2.30, Concert by the Louis Prell Instrumental Ensemble. Soloist: Lucie Lassen (Songs), March, The Great Little Army (Alford); Waltz, Miramar (Sontini); Two Pieces (Myddleton): (a) Patsy, (b) The Swanky Drum Major; Londonderry Air (Connor Morris); Selection from Show Boat (Kern); Ay, Ay, Ay (Perez-Freires); Two Pieces (Ancliffe): (a) Cinderella's Wedding, (b) Dainty Dance; Five Danish Songs; Intermezzo Demeiselle chic (Fletcher); Waltz, Euseño seductor (Rosas); The Selfish Giant (Coates); Viennese Song, Das ist das Herz von an urechten Wiener (Eall); Foxtrot (Caplat); Über die leide (Lüling); The Wooden Rocking Horse (Paul and Wollmer), 4.30, Exchange and Fish Market Prices, 4.45, Talk: A Health Resort, 5.15, French Lesson, 5.45, Weather, 5.54, Announcements, 6.0, News, 6.15, Time Signal, 6.30, Talk: Grecian Education, 7.0, Time Signal from the Town Hall, 7.1, Reading (C. Winther), 7.45 to 11.0, Radio Ball for the Older Generation by the Radio Orchestra, conducted by Launy Gröndahl, 7.45, March from Eva (Lehar); Waltz from Fra Luna (Lincke); Two Pieces (Métrá): (a) London Polka, (b) Mazurka, La Nueva; Toreador Waltz (Royle); Rhineland Polka; Kontrasejre (Andersen), 8.20, Pianoforte Solos: Twelve Fantasias (Horneman), 9.40, Old Dances (contd.); Mazurka, Pour nous deux (Meyer-Hellmund); Waltz, Amorettenränze (Gungl); The Lancers (Mikel); Polka, 9.10, News, 9.25, Folk Songs in Dialect, 9.40, Dances (contd.), 10.15, Songs by Inger Stoekmarr Hermann, 10.30, Dances (contd.); Britta Polka (Lumbye); Missouri Waltz (Logan); Petra Mazurka (Jensen); Tourniquet Polka (Ganne); Rits-Rats; Gallop (Klinkwort), 11.0, Time Signal and Chimes from the Town Hall.

**CORK.**—See Athlone.

**CRACOW**

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Topical Talk, 6.20, Miscellaneous Items, 6.25, See Warsaw, In the interval at 6.40, Programme Announcements, and at 9.0, Sports Notes, 11.0 (approx.), Close Down.

**DANZIG.**—See Heilsberg.

**DRESDEN.**—See Leipzig.

**FECAMP**

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C.: Happy Hour, Part I.—Orchestral Concert, Signature Tune; The Ghost Walk; Hawaiian Memories (Armandola); Fairy Tip-toes (Fredericks); Old Medley; Xylophone Solo, Jovial Jasper (Green); Rhapsody in Blue (Gershwin); Ginger Snaps (Bourdon); Song of the Islands (King), Part II.—Dance Music, It's not a Secret any more; Lou'iana Lullaby (Newman); Blue Cloud (Ewing); Poem (Fibich); Whistling under the Moon; Cornflowers and Poppies (Waldteufel); Spanish Sweetheart; Signature Tune, 12 Noon, Programme in French, 4.30 to 6.0, Programme in English by the I.B.C. 4.30, The I.B.C. Nursery Corner, 5.0, Gramophone Concert for Tunbridge Wells and Isle of Thanet Listeners: Signature Tune, The Night by the Sea; In a Country Lane (Coates); It's Sunday down in Caroline; Pianoforte Solo, When Day is done (Katscher); Song, Scot in Exile (Gatally); The Way to the Heart (Lincke); Danza della Strega (Piccini); Little Tommy (Macy); A Catastrophe (Sprague); Selection from He Wanted Adventure (Waller), 5.30, Orchestral Concert for Dover and Folkestone Listeners: Waltz, Roses from the South (Joh. Strauss); Violin Solo, Indian Love Call from Rose Marie (Primi), Blumenkünstler (von Blon); Pianoforte Solo, Still I love her (Gaskill); Moss Rose (Bosc); Song, Mountain Lovers (Robbins); Memories of Paris (Christiné); Selection from Music in the Air; Signature Tune, 6.0, Programme in French, 11.0 till Close Down, Programme in English by the I.B.C. 11.0, Tunes from the Talkies: Signature Tune, Sittin' in the Dark; Selection from The Crooner; Come out Vienna (Joh. Strauss); Moon Song (Coslow); A nous la liberté (Aurie); One little Drink (Akst); There's something about a Soldier (Gay); Everyone says I love you (Kalman); Selection from Il est charmant (Moretti); Signature Tune, 11.30, Concert by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Signature Tune, Come back to Erin; Selection from Shamrockland (Williams); Song, Throw open wide your Window (Calson); Serenade (Piémé); The Golden Musical Box (Krome); The Dear little Shamrock; The Capricious Musical Box (Fresco); Selection from The Chocolate Soldier (O. Strauss); Love in Cloverland (Peter); Signature Tune, Come back to Erin, 12.5 a.m. (Sunday), Late News Bulletin in English, 12.10 (approx.), Club Concert for Chippenhams Listeners: Signature Tune, The Chum Song; Cinderella's Wedding Day (Traumbauer); The Japanese Sandman (Whiting); The Jugler (Groitaseh); Play, Fiddle Play (Langrence); The King's Navee (Leslie); Isn't this a Night for Love; My Kingdom for a Smile from you; I've found the right girl; Don't blame me; Flor de Cuba; Egypt; The Shadow Waltz; I'll take an option on you; Signature Tune, 1.0, Dance Music: Signature Tune, Bells of Normandy; I cover the Waterfront; Oh! Johanna; Seven Years with the wrong Woman; I'll show you off; Learn to croon; At the old Pig and Whistle; A Girl like Nina; Forever; Then the Moon came out; Peter; Peter; My Moonlight Madona; Spanish Sweetheart; Whistling under the Moon; 'Twixt the Devil and the deep blue Sea; Under a Blanket of Blue; I love for Love; Signature Tune, 2.0, I.B.C. Good-night Melody and Close Down.

**FLENSBURG.**—See Hamburg.

**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News, 12.25, News, 12.35 to 2.15, See Langenberg, 2.15, See Stuttgart, 2.30, Weather, 2.40, Time and Economic Notes, 3.0, Concert by the Station Orchestra, conducted by Rudolf Schöne; Soloists, Rudolf Buh (Violin) and Gottlieb Zeithammer (Bass); Part I: Mozart Music: Overture, Titus; Violin Concerto in G; Six German Dances; Part II: Viennese Music: Overture, Waldmeister (Joh. Strauss); Waltz, Odeon-Tänze (Joh. Strauss); Viennese Songs; Ballet Music from Ritter Pasman (Joh. Strauss); Viennese Songs; Two Pieces (Joh. Strauss): (a) Waltz, Wien, mein Sinn, (b) Persian March; Viennese Songs; Two Pieces (Joh. Strauss): (a) Overture, Der lustige Krieg, (b) Egyptian March, 5.0, Programme from the Saar District, 5.20, Review of the Week, 5.35, Surprise Programme, 5.50, Weather and News, 6.0, Transmission for all German Stations, relayed from Breslau, 7.0, Topical Talk, 7.10, Stuttgart-Langenberg Exchange Programme, 9.0, Time and News, 9.20, See Stuttgart, 9.30, News, 9.45, See Langenberg, 11.0, See Stuttgart, 12 Midnight (approx.), Close Down.

**FREDRIKSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

OCT. 28th **SATURDAY** continued

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, 1,319 kc/s, 227.4 metres; Hanover, 530 kc/s, 566 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., Concert by the Small Station Orchestra, conducted by Gerhard Maasz: March, The Liberty Bell (Souza); Dorfbilder aus Ungarn (Dohnanyi); Madrigalette (Bullerian); Aria (Ibert); Scandinavian Intermezzo (Södermann); Gipsy Dance from Das Spielzeug Hrers Majestät (Königsberger); Selection from Tenor der Herzogin (Künneke); Tango from the Dance Suite (Niemann); Alreching Song, Nur auf die Minute kommt es immer an (Grothe). 4.0, Topical Talk. 4.30, Exciting Stories. 4.45 (from Kiel), Religious Address. 5.0, Concert by the Hamburg Philharmonic Orchestra, conducted by José Eibenschütz: Overture, Oberon (Weber); Legend, The Swan of Tuonela (Sibelius); Suite from No. 2 from Carmen (Bizet); Tarantella (Raff). 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Breslau, 7.0, Political Announcements. 7.10, Dramatic Programme (a) Schüsse auf St. Pauli—Radio Film (Max Maasz), (b) Die Seeschlange (The Sea-Serpent)—Humorous Yarn in a Sailors' Tavern, with Music by the Station Male Voice Quartet and Soloists. 9.0, News. 9.30, Dance Music by the Paul Kley Band. 10.30, Dance Music, relayed from the Hans Siegler. 12 Midnight, Close Down.

HANOVER.—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Folk Music on Gramophone Records. In the intervals at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.10, Book Review. 2.30, Handwork for Children. 3.0, Concert by the Small Station Orchestra, conducted by Wilken: Overture, The Thieving Magpie (Rossini); Selection from Fra Diavolo (Auber); Waltz, Ballschwärmer (Strecker); Overture, The Land of Smiles (Lehár); Watteau Suite (Zimmer); Waltz (Bayer); Melody (Yoshitomo); Teutonic March (Lilling). In the interval at 3.50 (approx.), Road Report. 4.50, Discussion: The Poor Pedestrian! 5.5, Programme Announcements. 5.15, Agricultural Prices. 5.25, Organ Recital by Gert Broede relayed from the University; Maria zart (Schlick); Our Father which art in Heaven (Buxtehude); Organ Sonata in D Minor, No. 3 (Bach); Acht Gott von Himmel sich darein (Krebs). 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Breslau. 8.0, Military Programme. 8.10 (from Danzig), Variety Programme: Part I: Wireless Potpourris; Part II: Merry Medley—The Good Old Days. In the interval at 9.0 (approx.), News, Weather and Sports Notes. 10.10, Festival Programme from Berlin (Funkstunde). 11.30 (approx.), Close Down.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m. and 20 kW. from 5.40 p.m.—11.40 a.m., Concert conducted by Wins: Les gamins de Paris (Berger); Les derniers gonttes (Kratze); Suite (Dormey); Melody (Kälman); Interlude of Gramophone Records; Descriptive Piece (Kockert); Two Popular Songs (Komzak); Mariška (Michiels); Si tu veux être jolie (Massenet); Wiener Mad'n (Zichrer); Interlude of Gramophone Records; Serenade melancholique (Tchaikovsky); Romance (Saint-Saëns); Spanish Dance (Sarasate); Interlude of Gramophone Records; Viennese Operetta Revue (Rohrecht). 1.40 p.m., Interval. 1.55, Gramophone Music. 2.30, Accordion Concert by the Four Serenaders. 3.10, Concert by the Rotterdam Philharmonic Orchestra, conducted by Flipse: Poem (Roussel); Scheherazade (Ravel); Cello Concerto. 4.10, Talk. 4.30, Concert (contd.): Cello Concerto; Symphony No. 3 (Saint-Saëns). 5.10, Literary Talk. 5.30, Concert by the Favourite Trio: Selection from Si (Mascagni); Une larme (Mussorgsky); Nuit d'étoiles (Debussy); Serenade in B flat (Widor); Serenade in A (Widor); Serenade (Piercé); Selection from Baal Schem (Bloch); Selection from La Bohème (Puccini); Interlude of Gramophone Records; Ich liebe dich (Grieg); Erotika (Grieg); Du alter Stefansturm (Kreisler); Souvenir (Drda); Cigany Song (Boldi); Komni Zigany (Kalman). 6.40, Concert by the Ramblers, conducted by Masman. 7.39, S.O.S. Messages. 7.42, Press Review and V.A.R.A. Notes. 7.56, Concert by the V.A.R.A. Orchestra, conducted by de Groot, relayed from the Concertgebouw, Amsterdam: Soloists: Aramesco (Songs) and Wigelaar (Violin); Overture and Ballet Music from Rosamunde (Schubert); Songs: (a) Das sie hier gewesen ist (Schubert), (b) Wer nie sein Brot mit Tränen ass (Schubert), (c) Es muss ein Wunderbares sein (Liszt), (d) O komm in Traum (Liszt); Hungarian Rhapsody No. 14 (Liszt); Suite, Four Ways (Coates). 9.0, Talk. 9.10, Concert by a Male Voice Quartet. 9.40, Concert by the V.A.R.A. Orchestra (contd.): Overture, The Force of Destiny (Verdi); Amor ti vieta di non amar (Giordano); Aria from La Bohème (Leoncavallo); Dance of the Hours from La Gioconda (Ponchielli); Violin Solo: Fantasia on Gounod's Faust, Op. 20 (Wieniawski); Aria from Tosca (Puc-

cini); Aria from Rigoletto (Verdi); Ballet Music from Sylvia (Delibes). 10.40, Gramophone Music. 11.40 (approx.), Close Down.

HORBY.—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres, 7 kW., until 3.40 p.m. Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—Programme arranged by the Catholic Radio Society (K.R.O.). 11.55 a.m., Concert by the Vienna Station Orctet: Per aspera ad Astra (Urbach); Waltz, Gold and Silver (Lehár); Overture, Mignon (Thomas); Goodbye (Tosti); Prayer and Temple Dance (Grieg); Selection from Coppélia (Delibes-Rhode). 12.40 p.m., Gramophone Music. 12.55, Concert (contd.). 1.25, Interval. 1.40, Programme for Young People. 2.10, Programme for Children. 3.40, Gramophone Music. 4.10, Writing Lesson. 4.40, Gramophone Music. 4.55, Sports Talk. 5.10, Concert by the K.R.O. Orchestra: Coronation March (Meyerbeer); Selection from Rund um die Liebe (O. Straus); Einzug der Frühlingsblumen (Kockert); Selection from Cavalleria rusticana (Mascagni); Spanish Dance No. 8 (Falla); A Wedding Day on Troldhaugen (Grieg); Ave Maria (Schubert); Selection from The Bird Fancier (Zeller). 6.0, Press Review. 6.25, Concert (contd.): Ballet Music from Feramors (Rubinstein). 6.40, Police Notes. 6.55, Talk. 7.15, Concert (contd.): Le jongleur (Rosey); Rusticana (Cortopassi); Festjubel (Blankenbiller). 7.25, Religious Address. 7.40, Concert by the K.R.O. Boys. 8.10, Press Review. 8.15, Concert by the Litwinzey Russian Ensemble: Potpourri Troika (Litwinzey); Waltz No. 1 (Dmand); Selection from A Life for the Tsar (Glinka); The Nightingale (Alabiev). 8.30, Folk Song Recital by Mlle. Cilea and Peter van Kooyen. 8.45, Concert by the K.R.O. Boys, conducted by Lustenhouwer. 9.0, The Litwinzey Russian Ensemble (contd.): Mazurka (Andreiev); Varietissima (Litwinzey); Selection from A Life for the Tsar (Glinka); In the silent night (Raclmaninov); Herzensmädchen (Dargomischky). 9.15, Folk Song Recital (contd.). 9.30, Recitation. 9.45, Concert by the Litwinzey Russian Ensemble (contd.): Humoresque (Dvorak); Melody (Peter); Night (Rubinstein); Berceuse (Tolstol). Licht, lebt euch aus (Glier). 10.0, Concert by the K.R.O. Boys (contd.). In the interval at 10.10, News. 10.40, Gramophone Music. 11.40 (approx.), Close Down.

INNSBRUCK.—See Vienna.

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, Financial Notes, Exchange, Racing Results and News. 8.10, Film Review. 8.25, Radio Concert. In the interval at 9.0, Weather and News.

KALUNDBORG.—See Copenhagen.

KIEL.—See Hamburg.

KLAGENFURT.—See Vienna.

KOSICE.—See Prague.

**LAHTI**

167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—4.0 p.m., Concert by a Children's Orchestra. 4.30, Talk. 5.15, Talk. 5.40, Concert by the Station Orchestra: Finnish Rhapsody (Kajanus); Intrata, Minuet and Serenade (Haapalainen); Selection from Faust (Gounod). 6.25, Recitation. 6.45, Organ and Song Recital, relayed from St. John's Church: Introduction and Passacaglia in F minor (Rger); Concert Variations (Bonnet); Prelude and Fugue on the Theme B.A.C.H. (Liszt). 7.45, News in Finnish. 8.0, News in Swedish.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—12.35 p.m., Concert of German Folk Songs and Dances, by the Frohe Sänger, the Station Choir, and Strienz (Bass). Part I: Songs of the High Road: (a) Es zogen drei Burschen wohl über den Rhein, (b) Wir ziehen in die Welt, (c) Ich ging durch ein an grasgrünen Welt, (d) Nun ade du mein lieb Heimatland. Part II, Songs of Love: (a) Warum bist du denn so traurig? (b) Liebeszutenken, (c) Ver-stohlen geht der Mond auf, (d) Sah ein Knab ein Rösslein stehn. Part III, Drinking Songs: (a) Stimmt an mit hell em, hohen Klang, (b) Im Krug zum grünen Kranze, (c) Auf-bruch aus dem Wirthaus, (d) Wohlant noch getrunken. Part IV, Dance Songs: (a) De sure Buredanz, (b) De Gemittlichkeit, (c) Wena hier een Pott mit Bohnen steiht, (d) Abschiedslied. 1.30, Programme for Young People—German History. 2.15, See Stuttgart. 2.30, Economic Notes. 2.50, Political Address. 3.0 to 3.35, See Frankfurt. 3.35, Humorous Dialect Programme. 5.50, News. 6.0, Transmission for all German Stations, relayed from Breslau. 7.0, See Frankfurt. 7.10, Stuttgart-Langenberg Exchange Programme. A Day's Wireless Programme—Humorous Sequence. Part I. 9.0, See Frankfurt. 9.20, See Stuttgart. 9.30, News and Weather. 9.45, A Day's Wireless Programme. Part II. 11.0, See Stuttgart. 1.0 a.m. (Sunday), Close Down.

LAUSANNE.—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m., Weather and Time. 11.5, Gramophone Music. 12.15 p.m., News and Programme Announcements. 12.35, See Langenberg. 1.30, News. 1.45, Programme for Children. 2.30, Talk: Agrarian Policy. 2.45, Economic Notes and News. 3.0 (from Dresden), Concert by the Dresden Soloist Ensemble: Overture, Die schöne Müllerin (Michiels); Reigen (Reger); Waltz in A, Op. 39, No. 15 (Brahms); Spanish Dance (Falla); Nachmittagsstille (Jensen); Selection from The Pearl Fishers (Bizet); Ballet Suite, La forêt enchantée (Drigo); Nocturne from the String Quartet in D (Borodin); Waltz, Strandnixon (Ohlson); Selection from King and Marshal (Heise); Schlämmerlied, Op. 20, No. 4 (Ries); Waltz, Künstlerträume (Vollstedt); Selection from The Yellow Jacket (Lehár). 4.0, A Modern Dictionary. 4.15, Economic Review of the Week. 4.40, German for Germans. 5.0 (from Dresden), Choral Concert. 5.30, Reading. 5.50, Review of the Day's Events. 6.0, Transmission for all German Stations, relayed from Breslau. 7.0 (from Dresden), Das süsse Mädel—Operetta in Three Acts (Reinhardt). 9.0, News and Sports Notes. 10.0, Dance Music. 11.0 (approx.), Close Down.

LINZ.—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—6.0 p.m., Talk on Philosophy. 6.30, Foreign Affairs. 7.0, Accordion Solos. 7.45, Vocal Concert. 8.30, Time and Press. 8.45, Concert by the Station Orchestra. 10.0 (approx.), Close Down.

**LUXEMBOURG**

253 kc/s, 1,191 metres; 200 kW.—7.0 p.m., Concert by the Radio Orchestra, conducted by Henri Pensis: Overture, Heimkehr aus der Fremde (Mendelsolun); Peer Gynt Suite (Grieg); Prelude and Ballet Music from Le Mariage de Strauksaloff (Hardoun); Salut d'amour (Elgar); Melody (Powell-Salabert); Spanish Dances (Moszkovsky). 8.10, Gramophone Music: Quartet in G minor, Op. 10 (Debussy); Alborada del Grazioso (Ravel). 8.50, News in French. 9.0, Song Recital by Gustave Simon: Ständchen (Schubert); Lullaby (Weber). Four Songs (Schumann): (a) Die Nussbaum, (b) Die Lotosblume, (c) Ich grille nicht, (d) Die beiden Grenadiere; Wogenlied (Mozart); Aria from Le roi de Lahore (Massenet); Aria from Hérodiade (Massenet). 9.25, French Music by the Radio Orchestra: Musiques foraines (Schmitt-Salabert). 9.50, News in German. 10.0, French Music (contd.): Le chant du Muletier (Pesse); Meditation (Gounod); Ballet Suite from Sylvia (Delibes). 10.30, Variety Music and Dance Music on Gramophone Records.

**LWOW**

788 kc/s, 381 metres; 10 kW.—6.5 p.m., Talk. 6.18, Gramophone Music. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 10.5, Dramatic Programme relayed from Wilno, 533 kc/s, 563 metres. 11.0 (approx.), Close Down.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.0 p.m., Gramophone Music. 7.15, Musical Programme. 7.30, Programme relayed from Paris (Eiffel Tower). 9.0, Concert relayed from Marseilles, 950 kc/s, 315 metres. After the Concert, News.

**MADRID**

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 29 kW. Programme for Listeners in the Canary Islands, Guinea and Europe.—6.0 p.m., Concert of Light Music. 7.15, Talk. 7.30, Light Music. 8.0 to 10.30, Interval. 10.30, Variety Programme followed by Topical Review, relayed from Madrid (EAJ7), 12 Midnight to 12.30 a.m. (Sunday), Programme in English by the I.B.C.: Tiptoe through the Tulips; Black Eyes; Soft Lights and Sweet Music; Hobo, you can't ride this Train; Marta; Selection from The Land of Smiles; Rosa del Rio; That's my Home. 12.30, I.B.C. Goodnight Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Topical Review, Talk and Dance Music. 8.15, Radio Journal. 8.30 to 9.15, Interval. 9.15, English Lesson. 9.30, Chimes, Time and Topical Review. 9.45 (approx.), Variety Programme with Songs by Margarita Cueto (Soprano) and Reading by Luis de Tapia. 11.45, Topical Review. 12 Midnight, Chimes and Close Down.

MALMO.—See Stockholm.

MILAN.—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—6.0 p.m., Programme of Music and Addresses, arranged by the Czecho-slovak Sokol Union. 6.45, See Prague. 1.30 (approx.), Close Down.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW. 10.45 a.m., Weather. 1.45 p.m., Weather Report. 2.0, Request Concert. 3.0, English Lesson. 3.30, Literary Programme: Part I: Old Russian Literature; Part II: Humorous Reading. 4.30, Programme for Young People. 5.30, Concert of Chamber Music, relayed from the Radio Theatre. 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather Report.

MOTALA.—See Stockholm.

MUHLACKER.—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—2.25 p.m., Talk: Munich under Ludwig of Bavaria. 2.45, Weather and Agricultural Prices. 3.0, Labour Market Report. 3.10, Franz Loser reads from his Novel, Menschen der Erde. 3.30, Concert by the Philharmonic Orchestra, relayed from Würzburg. 4.45, Programme for Girls. 5.10, Two Songs by a Children's Choir: (a) Weit lasst die Fahnen wehen, (b) Kamarad, nun lapp Dir sagen. 5.25, String Trio (Baentsch). 5.45, Wireless Notes. 6.0, Transmission for all German Stations, relayed from Breslau. 7.0, Concert by the Station Orchestra, conducted by Karl List. Soloist: Urbano (Baritone). Overture, The Taming of the Shrew (Götze); Suite, Op. 22 (Müller-Rehmann); Baritone Aria from Ernani (Verdi); Ballet Music from Prometheus (Beethoven); Cavatina from The Barber of Seville (Rossini); Caprice italien (Tchaikovsky). 8.0, Franconian Vintage Festival, relayed from the Huttensaal Würzburg. 9.0, Time, Weather, News and Sports Notes. 10.0, Serenade by the Station Dance Band, conducted by Bruno Aulich. 11.0 (approx.), Close Down.

NAPLES.—See Rome.

NOTODDEN.—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—3.30 p.m., Variety Concert on Gramophone Records. 4.15, Programme for Children. 5.15, Concert of Norwegian Music. 5.45, Talk on Economics. 6.0, Announcements, Weather and News. 6.30, Talk. 7.0, Time Signal. 7.1, Concert by the Station Orchestra, conducted by Kramm. In an interval, Recitation. 8.40, Weather Report. 9.0, Topical Talk. 9.15, Popular Concert.

OSTERSUND.—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopplavoro Notes, Tourist Talk, Agricultural Report and Giornale Radio. 7.20, Gramophone Music. In the interval at 7.25, Sports Notes, Time and Announcements. 7.45, See Rome. 7.55, La fidanzata di Milu—Operetta in Three Acts (Cuscina). In the intervals, Talk, Book Review and Announcements. After the Operetta, Giornale Radio.

**PARIS**

EIFFEL TOWER, Call FE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals).—5.45 p.m., Le Journal Parlé. 7.30, Une fête a la Sous-Prefecture en 1900—Music and Poetry of the Period arranged by Delamere. 9.0 (approx.), Close Down.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Records of Victor Boucher. 7.15, Le Journal Parlé and Review of the Foreign Press. 7.35, Song Recital. 7.50, Talk: The Event of the Week. 8.0, Theatre Talk. 8.10, Interval. 8.25, Quartet (Fauré) by the Station Quartet. 8.55, Commentary on a Legal Case. 9.10, Concert. 11.0, News.

**PARIS**

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30 a.m., Weather and Physical Culture (contd.). 7.45, Gramophone Records. 8.0, Weather and Press Review. 9.0, Concert by the Societé des Concerts, relayed from the Old Conservatoire. 11.30, Interval. 12 Noon, César Franck and his Pupils—Gramophone Concert: Le Chausseur maudit (Franck); Le Mariage des Roses (Franck); Nocturne (Franck); Symphony (Franck); Le Colibri (Clausson); Le Temps des Lilas (Clausson); Symphony on a Mountain Song (d'Indy); La Cloche des Morts (Ropartz); Three Airs (Duparc); (a) Clausson triste, (b) La vie antérieure, (c) Extase; Cantilène-Improvisation (Touneire). In the intervals at 1.0 p.m., Exchange, Weather and News, and at 1.30, Exchange. 2.0, Exchange. 3.0, Programme for Children. 3.45, Market Prices. 6.20, Market Prices. 6.30, Agricultural Talk. 6.50, Gramophone Records: Les Enfants terribles (Corbin); Il siffle d'un Sourire (Borel-Clerc); La Carterana (Guerrero). 7.0, Talk: Amateurs and Professionals. 7.20, Gramophone Music: Pierrot galant (Chillemont); Les Lilas (Doelle); Mandoline (May); Sicm

OCT. 28th **SATURDAY** continued

pre (Bianco); Amoretten-Tänze (Gungl); Montparnasse (Heintz); Love Song (Bixio); A la Godille (van Hoorebeck). 7.45, Review of the Latin Press. 8.0, Gramophone Concert, with Songs by Mme. Marie Simon: Introduction, Waltz and Mazurka from Coppélia (Delibes); Sea Chanties (Gaubert); Selection from Scaramouche (Messager); Spinning Song (Mendelssohn); Nocturne from La Navarraise (Massenet); Le Pas des Fleurs (Delibes); Erste Begegnung (Grieg); Melody in F (Rubinstein); Songs: (a) Soleil couchant (Verlaine-Revel), (b) Les hiboux (Braudelaire-Revel), (c) En riant (Richepin-Revel); Valse triste (Sibelius); Un peu d'amour (Silesu); Monotonie (Planhard); Quadrille from La Vie Parisienne (Offenbach); Song of the Hours (Privas); Allegrias de Jerez (Ramall); Muleteers' Song (Tessarech Goudette); A Melody (Rumberg); Song from Le Caid (Thomas); March; Venetian Barcarolle (Richepin); Pas des Echarpes (Chaminade); Marche tartare (Ganne); Air (Finck); La Poupée d'Arlequin (Darcy); March (Jurek). In the intervals at 8.30, News and Weather, at 8.40, Review by Rieux and at 9.15, Press Review and News.

**PITTSBURGH**

**KDKA, 980 kc/s, 306 metres; 50 kW.** Relayed by **W8XK** on 48.86 metres and 25.27 metres.—7.10 to 11.0 p.m., **New York Relay.** 7.0, Musical Originalities. 7.30, Concert Echoes. 8.0, Words and Music. 8.30, Wealth of Harmony. 9.0, Dance Masters. 9.30, Concert Favourites. 10.0, Casino Orchestra. 10.30, Neil Sisters. 10.45, Orphan Annie. 11.0, News and Piano Classique. 11.15, Sports Notes. Pat Haley. 11.30, A Recreo. Bill and Alex. 11.45, Al Williams. 12 Midnight, Happy Felton's Orchestra. 12.30 to 3.0 a.m. (Sunday), **New York Relay.** 12.30, Circus Days. 12.45, Annie, Judy and Zoë. 1.0, Waldorf Astoria Orchestra. 1.30, Sous les Ponts de Paris. 2.0, Jamboree. 3.0, Behind the Law.

**PORSGRUND.**—See Oslo.

**POZNAN**

**896 kc/s, 335 metres; 1.9 kW.—6.5 p.m.,** Miscellaneous Items. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45 to 9.0, See Warsaw. 9.0, Time and Sports Notes. 9.15 till Close Down, Programme from Warsaw. 11.0 (approx.), Close Down.

**PRAGUE**

**614 kc/s, 488.6 metres; 120 kW.—3.30 p.m.,** Military Band Concert, relayed from the St. Venceslas Square. 5.0, Choral Concert for Workers. 5.30, German Transmission: Programme relayed from the Urania Hall. News after the Programme. 6.0, See Moravská-Ostrava. 6.45, My Country—Symphonic Suite (Smetana), by the Czech Philharmonic Orchestra, relayed from the Smetana Hall. 9.0, Time and News. 9.15, An Historical Play (Balda and Brozik), with Music by a Military Band and a Vocal Quartet. 10.30 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**743 kc/s, 403 metres; 25 kW; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m.,** (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Lausanne), Songs on Gramophone Records. 12 Noon (from Lausanne), Financial News. 12.10 p.m. (from Lausanne), Gramophone Concert, Part I: Popular Swiss Music. Part II: Light Music. 1.0, Interval. 2.58, Time Signal from the Neuchâtel Observatory. 3.0 (from Lausanne), Concert by the Small Station Orchestra, conducted by Moser. 3.45, Concert relayed from Lugano. 5.0 (from Geneva), Programme for Children. 5.20 (from Geneva), Programme for Young People. 5.40 (from Geneva), Talk on Films. 6.5 (from Geneva), Talk on the next International Horse Show. 6.30 (from Geneva), Wireless Notes and Weather. 7.0 (from Geneva), Reading (Jules Renard). 7.35, Concert by the Radio Suisse-Romande Orchestra, conducted by Ernest Ansermet. Soloist: Vladimir Horowitz (Pianoforte); Overture, Coriolanus (Beethoven); Choral on a Theme of Leo Hassler (Templeton Strong); Pianoforte Concerto in B Flat (Tchaikovsky); Prélude à l'après-midi d'un faune (Debussy); Four Pieces for Pianoforte (Chopin); Bolero (Ravel). 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (from Geneva), Dance Music. 10.30 (approx.), Close Down.

**REYKJAVIK**

**1,200 metres; 21 kW.—8.5 p.m.,** Programme for Children. 8.30, Weather. 8.40, Musical Programme and Announcements. 9.0, Chimes and News. 9.30, Reading. 10.0, Music by the Radio Trio, followed by Choral Pieces on Gramophone Records and Dance Music. 1.0 a.m. (Sunday), Close Down.

**RIGA**

**572 kc/s, 525 metres; 15 kW.—6.0 p.m.,** Concert for the Fifteenth Anniversary of the Czechoslovakian Republic: String Quartet in E Minor, From my Life (Smetana); Czech Songs for Male Voice Choir; In Bohemian Meadows and Forests (Smetana); Suite (Dvorák); Czech Dances (Ruzek); Polka from Schwanda the Piper (Weinberger). In the intervals at 7.5 and 8.0,

News. 8.30, Gramophone Dance Music. 9.0, Dance Music from the Café Schwarz. 10.0 (approx.), Close Down.

**RJUKAN.**—See Oslo.

**ROME**

**Call 190, 680 kc/s, 441 metres; 50 kW.** Relayed by **Naples, 941 kc/s, 319 metres; Milan, 662 kc/s, 453.2 metres from 7.45 p.m. and 290, 11,810 kc/s, 25.4 metres from 4.15 p.m.—12 Noon,** Orchestral Concert. In the interval at 12.30 p.m., **Giornale Radio.** 1.0 to 1.15 (approx.), Time and Announcements. 3.30, Children's Radio Review. 3.55, **Giornale Radio** and Report of the Royal Geographical Society. 4.10, Weather. 4.15 to 5.0, Orchestral Concert: Melody (Frimmel); Idyll (Culotta); Io sogno così (Branca); Selection from Firenze sorridente (Raffaelli); Melody (Abel); Scènes pittoresques (Massenet); Scherzo, Carnevalesca (Breschi); Melody (Weik). 5.40 (Naples); Shipping and Sports Notes. 5.45, Morse Signals and Popolavoro Announcements. 6.0, Tourist Report. 6.10, Agricultural Notes and Wheat Market Report. 6.20, News in Foreign Languages. 6.40, **Giornale Radio.** 7.0, Time and Announcements. 7.15, Gramophone Music. 7.30, **Giornale Radio** and Sports Notes. 7.45, Italian Anthems; Marcia Reale (Gabetti); Giovinezza (Blanc); Inno delle Legioni (Blanc). 8.0 (approx.), Mascagni Programme: (a) Pirotta—Opera in Two Acts. (b) Cavalleria Rusticana—Opera in One Act. In the interval, Programme in Commemoration of the March on Rome. After the Opera, **Giornale Radio.**

**SALZBURG.**—See Vienna.

**SCHENECTADY**

**WGY, 790 kc/s, 379.5 metres; 50 kW.** Relayed at intervals by **W2XAF** on 31.48 metres and by **W2XAD** on 19.56 metres.—12.45 a.m. (Sunday), Stock Reports. 1.0 to 1.45, **New York Relay.** 1.0, Rollicker Quartet. 1.15, Herman and Banta, Instrumentalists. 1.30, Sous les Ponts de Paris. 1.45, Uteia Singers. 2.0 to 4.0, **New York Relay.** 2.0, Antoinette's Cubans. 2.30, K-7, Secret Service Spy Story. 3.0, Saturday Night Dancing Party. 4.0, Programme Résumé.

**SCHWEIZERISCHER****LANDESENDER**

**BEROMUNSTER, 653 kc/s, 450 metres, 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m.** (from Berne), Gymnastics. 11.0 (from Berne), Gramophone Music. 11.29, Time Signal from Neuchâtel Observatory. Weather, and News. 11.40 (from Berne), Weekly Review. 11.50 (from Berne), Gramophone Music. 12.15 p.m. (from Berne), Songs. 12.25 (from Berne), Time, Weather, and Exchange. 12.30 (from Zürich), Talk: The Radio Industry in Switzerland. 12.45 (from Zürich), Concert by the Zürich Zither Quartet. 1.15 (from Zürich), Talk: Women as Buyers. 1.45 (from Zürich), Gramophone Music. 2.0 to 3.0, Interval. 3.0 (from Zürich), Accordion Concert, conducted by Hebling. 3.45, Concert relayed from Lugano. 5.0 (from Basle), Gramophone Concert of Opera and Operetta Music. 5.30 (from Basle), Talk: The Turkish Crescent over Bosnia. 6.0, Chimes from Zürich Churches. 6.15 (from Basle), Time, Weather and Market Prices. 6.20 (from Basle), Concert by a String Orchestra. 6.55 (from Basle), Talk: Pioneers of Radio. 7.25 (from Basle), Harpsichord Recital. 8.0, Weather and News. 8.10 (from Basle), Concert by the Einigkeit Male Voice Choir. 9.0 (from Berne), Gala Concert of Czech Music. 10.0 (approx.), Close Down.

**SOTTENS.**—See Radio-Suisse Romande.

**STOCKHOLM**

**689 kc/s, 436 metres; 55 kW.** Relayed by **Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—3.0 p.m.,** Orchestral Concert: Military March (Schubert); Overture, The Merry Wives of Windsor (Nicola); Minuet (Bocherini); Norwegian Rhapsody No. 3 (Svendsen); Humoresque (Aulin); Selection from Belsazar (Sibelius); Cherry Ripe (Scott); Flower Waltz (Duk-Sutsky); Sleepy Piano (Mayer); Ay! Ay! (Freire). 4.5, Programme for Children. 4.30, Song Recital by Sten Hermelin. 4.45, Reading from The Canterville Ghost. 5.15, Gramophone Music. 6.30 (from Göteborg), Swedish for Swedes. 7.0 (from Göteborg), Old Time Dance Music. 8.45, Weather and News. 9.0, Modern Dance Music. 11.0 (approx.), Close Down.

**STRASBOURG**

**869 kc/s, 345 metres; 11.5 kW.—11.30 a.m.,** Gramophone Music. Cadets de Brabant (Eurine); Two Melodies (Maquis); Griserie (Bosc); Dreaming (Joyce); Träumerei (Schu-

mann); Die Spinnerin (Popper); Hungarian Dances Nos. 5 and 6 (Brahms); Coucou (Hossien); Ronde des heures (Sylvano); Song from Fortunio (Messager); Intermezzo from L'Arlesienne (Bizet); Couplet from Così fan tutte (Mozart); Two Songs from Tosca (Puccini); Selection from Le pré aux clercs (Hérold). 12.45 p.m., News. 1.0, Time. 1.1, Gramophone Music. 2.0, Legal Talk in German. 2.15, Gramophone Music. 3.0, Music Talk in French; Harmony and Colour. 3.15, Interval. 4.0, Dance Music on Gramophone Records. 5.0, Symphony Concert relayed from Paris. 7.0, French Lesson. 7.15, Agricultural Talk in German. 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German and Lottery Results. 8.30, Quintet for Pianoforte and Strings (Schumann) by the Station Soloists. 9.15 (approx.), Press Review in French. 9.20, Concert by the Torino Maudoline Club, conducted by Jules Meyer. Florentine March (Fueik); Selection from La Traviata (Verdi); In the mystic land of Egypt (Kettelbey); Suite, Village Fête (Andrieu); Intermezzo, Love's Dream after the Ball (Czibulka); Serenade (Toselli); March, Les Cygones d'Alsace (Mayer). 10.30, Dance Music from the Savoy. 12 Midnight, Close Down.

**STUTT GART**

**MUHLACKER, 832 kc/s, 360.5 metres; 60 kW.** Relayed by **Freiburg, 527 kc/s, 570 metres.—12.35 to 2.15 p.m.,** See Langenberg. 2.15, Morse Lesson. 2.30, Concert by the Canstatt Accordion Club. March, So geht's zu bei uns in Wean (Hornischer); Waltz, Friedenstimmen (Maeder); March, Gruss aus dem Schwarzwald (Vogel); Ländler (Hunziker); German Song (Weber). 3.0, to 5.35, See Frankfurt. 5.35 (from Freiburg), Reading (Swoboda). 5.50, Time, Agricultural Notes and Weather. 6.0, Transmission for all German Stations, relayed from Breslau. 7.0, See Frankfurt. 7.10, **Stuttgarter-Langenberg** Exchange Programme, with Five Hundred Kilowatts—Variety Programme. 9.0, See Frankfurt. 9.20, Talk: Things you should know. . . . 9.30, News, Weather and Sports Notes. 9.45, Variety Programme (cont'd.). 11.0, Serenade. 1.0 a.m. (Sunday), Close Down.

**SUNDSVALL.**—See Stockholm.

**TOULOUSE**

**RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—6.15 p.m.,** Accordion Solos. 6.30, Programme by an Argentine Band. 6.45, Light Music. 7.0, Orchestral Music. Valse bluette (Drigo); Slav Fantasia in B Minor (Dvorak); Melody (Landler); Magic Roses (Orth); 7.15, News. 7.30, Cello Recital. Le Cygne (Saint-Saëns); Minuet (Mozart); La Filleuse (Dunkler); Nocturne in E flat (Chopin). 7.45, Concert, Part I. Operetta Music. Selection from: (a) Le Jour et la Nuit (Lecocq). (b) The Merry Widow (Lehar). (c) Waltz from Yes (Yvain); Selection from The Chocolate Soldier (O. Strauss). Part II. Opera Music. Arias from: (a) La Favorita (Donizetti). (b) Sigurd (Reyer). (c) Figaro (Mozart) and (d) L'Africain (Meyerbeer). 8.15, Military Music. 8.30, Orchestral Music. 8.45, Extracts from Sound Films. 9.0, Waltzes. 9.30, Opera Music. Airs from Fortunio (Messager), La Bohème (Puccini), Louise (Charpentier), The Fair Maid of Perth (Bizet) and Don Quixote (Massenet). 9.45, Orchestral Concert. March (Meyerbeer); Overture, The Caliph of Bagdad (Boieldien); La boutique fantasque (Rossini-Respighi); Valse de Phryné (Ganne); Valse lumineuse (Ganne); Potpourri of Overtures (Leggett); Mazurka in B minor (Chopin). 10.15, News. 10.30, Concert for Listeners in Morocco. Mont petit homme et moi (Rufus); Why (Albert); Tu m'as (Lenoir); Conchita (Parès van Paris). 11.0, Light Music. 11.15, Dance Music. 12 Midnight, News. 12.5 a.m. (Sunday), Extracts from Sound Films. 12.30 (approx.), Close Down.

**TRIESTE**

**1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m.** till Close Down. See Turin.

**TRONDHEIM.**—See Oslo.

**TURIN**

**1,096 kc/s, 273.7 metres; 7 kW.** Relayed by **Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m.,** Gramophone Concert. Part I: Neapolitan Songs. Part II: Songs from Sound Films. 5.0 to 5.5, Weather. 5.40, **Giornale Radio**, Lottery Results, Popolavoro Announcements and Gramophone Music. 6.0, Time, Tourist Talk and Gramophone Music. 6.10, Agricultural Notes, and Wheat Market Reports. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Announcements, **Giornale Radio** and Weather. 7.25, Talk: Events and Problems. 7.40, Programme in commemoration of the March on Rome. In the interval: Book Review. 10.0, **Giornale Radio.**

**VATICAN CITY**

**15,120 kc/s, 19.84 metres (Morning) and 6,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15 a.m.,** Religious Announcements in Various Languages. 7.0 to 7.15 p.m., Religious Information in Italian.

**VIENNA**

**581 kc/s, 517 metres; 100 kW.** Relayed by **Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m.,** Concert by the Wiener Symphoniker, conducted by Josef Holzer: Overture (Stippé); Suite à l'Antique (de Taaey); Ave im Kloster (Kienzl); Waltz, Die Schönbrunner (Janner); Intermezzo from Thousand and One Nights (Joh. Strauss); Hat ein Englein im Himmel an mich gedacht (Bittner-Kornigold); Potpourri (Grauichstaeden). In an interval at 12 Noon, Time and Announcements. 1.0, Interval. 2.0, Time and Announcements. 2.15, English Conversation Lesson: Two Thousand Years of Wit and Wisdom. 2.40, Concert by the Vienna Teachers' A-Cappella-Choir, conducted by Hans Waagner-Schönkirch. 3.20, Reading (Arno Holz). 3.45, Gramophone Concert: Waltz, Frühlingsstimmen (Joh. Strauss); Song from Schön ist die Welt (Lehar); Duet from Eine Nacht in Venedig (Joh. Strauss); Du alter Stephansturm (Kreislér); Song from Countess Maritza (Kálmán); Song from Die Fledermaus (Joh. Strauss); Guitar (Moszkovsky); Tango (Albeniz); Song from The Gipsy Baron (Joh. Strauss); Kokoko-Ständchen (Heilmund); Waltz, Parla (Arditi); Waltz, The Blue Danube (Joh. Strauss); Santa Lucia (Gordigiani); Military March (Schubert); The Red Sarafan (Varlamov); Finale from Die Fledermaus (Joh. Strauss). 5.0, Talk: Javanese Wedding Customs. 5.30, Topical Talk. 6.0, In Schubert's Time—Concert by the Bohème Quartet and the Wiener Symphoniker: Conductor: Max Schönherr; Overture, Fidelio (Beethoven); Quartet: (a) Characteristic March (Schubert-Riedinger), (b) Die Nachtigall (Schubert); Variations on the Kaiserlied (Haydn); Three Pieces (Schubert): (a) Ständchen, (b) Ballet Music from Rosamunde, (c) Die Nacht; Overture, Semramis (Rossini); Quartet: An meine Laute (Schubert); Overture, Euryanthe (Weber). In an interval at 6.35, Time and Announcements. 7.5, Today's Motto. 7.10, Es rufft eine Melodie—A New Prize Winning Radio Play. 7.20, Der Kompagnon—Comedy in Four Acts (Adolph L'Arranage). 9.20, News. 9.50, Dance Music on Gramophone Records and Announcements.

**WARSAW**

**212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m.,** Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Popular Music on Gramophone Records. 11.30, Radio Journal and Weather Report. 11.35, Gramophone Music. 12 Noon, Interval. 2.30, Economic Notes. 2.40, Gramophone Music. 2.55, Aviation Report and Anti-Gas Drill. 3.0, Programme for Invalids relayed from **Lwów, 788 kc/s, 381 metres.** 3.40, French Lesson. 3.55, Concert by the Station Symphony Orchestra, conducted by Oziminski: Overture, Nachklänge aus Ossian (Gade); Valse triste (Sibelius); Intermezzo from the Pianoforte Concerto in B flat minor (Tchaikovsky-Artok); Chant d'amour (Stojowski); Mazurka (Noskowski-Kondracki); Caucasian Suite Sketches (Ippolitov-Ivanov). 4.50, Talk on Gardening. 5.0, Talk: An Excursion into Upper Silesia. 5.20, Saxophone Duets with Songs. 6.5, Miscellaneous Items. 6.25, Reading. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Gala Concert of Czech Music for the Fourteenth Anniversary of Czechoslovakia's Independence: The Station Symphony Orchestra conducted by Jirak, with Introductory Talk. In the interval at 8.0, Answers to Correspondence. 9.0, Sports Notes. 9.15, Song and Violin Recital of Polish Music by Mmes. Arganska and Dubiska: Four Songs: (a) Knowst thou the Land (Moniuszko), (b) The Bagpipe Player (Paderevsky), (c) Deception (Karlwicz), (d) Réveil (Pankiewicz); Violin Solos: (a) Romance from the Concerto for Violin (Karlwicz), (b) Caprice and Tarantella in E flat (Wieniawski); Four Songs; Violin Solos (Szymanowski): (a) The Fountain of Arethusa, (b) Ballet Music. 10.0, Aviation Weather Report and Police Notes. 10.5, Dance Music.

**WILNO**

**533 kc/s, 563 metres; 16 kW.—6.20 p.m.,** Miscellaneous Items. 6.25, Educational Programme. 6.40, Programme Announcements. 6.45, See Warsaw. 10.5, The Wilno Cuckoo Programme relayed from the Smorgonia Club. 10.40, Dance Music on Gramophone Records.

**ZAGREB**

**977 kc/s, 307 metres; 0.75 kW.—4.0 to 5.30 p.m.,** Concert by a Russian Choir and Balalaika Orchestra. 6.35, Talk. 6.45, Announcements. 7.15, Concert by a Russian Choir. 8.15, Orchestral Concert of Light Music. 8.45, Dance Music. 9.0, News, Weather and Programme Announcements. 9.15, Dance Music. 10.0 (approx.), Close Down.

**ZURICH.**—See Schweizerischer Landessender.

# PRINCIPAL BROADCASTING STATIONS OF EUROPE

Arranged in Order of Wavelength

Metres.	kc/s.	kW.	Station.	Tuning Positions.	Metres.	kc/s.	kW.	Station.	Tuning Positions.
1935	155	7	Kaunas (Kovno) (Lithuania) .. .. .		368.1	815	0.7	Fredriksstad (Norway). (Relays Oslo)	
1875	160	8.5	Huizen (Holland) (Kootwyk. 50kW., after 3.40 p.m.) (K.R.O. and N.C.R.V. programmes.)		364.1	824	1	Bergen (Norway)	
1796	177	40	Lahti (Finland) .. .. .		363.6	825	13	Algiers (Algeria)	
1725	174	75	Radio Paris, CFR .. .. .		360.6	832	60	Mühlacker (Stuttgart) (Germany)	
1635	183.5	60	Berlin (Deutschlandsender) (Germany). (S.-W. Stn. DJA on 31.38 m., DJB on 19.73 m., DJC on 49.83 m., DJD on 25.51 m., DJE on 16.86 m.)		355.9	843	50	London Regional (Brookmans Park)	
1554.4	19	30	Daventry National .. .. .		352.1	852	7	Graz (Austria). (Relays Vienna)	
1538	195	7	Ankara (Angora) (Turkey) .. .. .		348.8	860	7.6	Barcelona, EAJ1 (Spain)	
1481	202.5	500	Moscow, RV1 (Old Komintern) (Russia)		348.8	860	10	Leningrad, RV70 (Russia)	
1446	207.5	13	Eiffel Tower, FL, Paris .. .. .		345.2	869	11.5	Strasbourg, PTT (France)	
1412	212.5	120	Warsaw I (Poland) .. .. .		341.7	878	35	Brno (Brunn) (Czechoslovakia)	
1380	217.5	100	Novosibirsk, RV76 I (Russia)		338.2	887	15	Brussels II Velthem (Belgium). (In Flemish)	
1354.4	221.5	30	Motala (Sweden). (Relays Stockholm)		335	896	5	Cadiz (Spain)	
1304	230	100	Moscow, WZSPS (Trade Union) (Russia)		334.4	897	1.9	Poznan (Poland)	
1200	250	5	Stamboul (Turkey) .. .. .		331.5	905	50	Milan (Italy). (Relays Turin)	
1200	250	21	Reykjavik (Iceland) .. .. .		328.2	914	60	Poste Parisien (France)	
1190	252	200	Luxembourg .. .. .		325	923	60	Breslau (Germany)	
1170	256	25	Tashkent, RV11 (Russia)		321.9	932	10	Göteborg (Sweden). (Relays Stockholm)	
1154	260	60	Kalundborg (Denmark). (Relays Copenhagen)		318.8	941	0.25	Dresden (Germany). (Relays Leipzig)	
1154	260	20	Monte Ceneri (Switzerland).		318.8	941	1.5	Naples, INA (Italy). (Relays Rome)	
1117	268.5	40	Moscow, Popoff RV58 (Russia)		315.8	950	1.6	Marseilles, PTT (France)	
1083	277	60	Oslo (Norway) .. .. .		312.8	959	1.7	Cracow (Poland)	
1071	280	35	Tiflis, RV7 (Russia) .. .. .		312.8	959	10	Genoa, IGE (Italy). (Relays Turin)	
1035	290	36	Kiev, RV9 (Russia)		309.9	968	50	West Regional (Washford Cross)	
1000	300	100	Moscow RV39 (Russia). (S.-W. Stn. on 50 m.)		307	977	0.7	Radio Vitus (Paris). (S.-W. Stn. on 43.75 m.)	
938	320	20	Kharhov, RV4 (Russia)		307	977	0.75	Zagreb (Yugoslavia)	
857	350	100	Leningrad (Russia)		304	986	13	Bordeaux Lafayette, PTT (France)	
840	357	18.5	Budapest (Hungary) .. .. .		301.5	995	50	North National (Manchester)	
825	363.6	50	Sverdlovsk, RV3 (Russia)		298.8	1004	11	Tallinn (Estonia)	
760	395	1.3	Geneva (Switzerland). (Relays Sottens)		296.1	1013	20	Hilversum (Holland). (7 kW. before 4.40 p.m.) (F.A.R.A., A.F.R.O. and V.P.R.O. programmes.)	
720	416.6	20	Moscow, RV2 (Experimental) (Russia)		293.5	1022	0.7	Limoges, PTT (France)	
690	434.6	1.5	Oulu (Uleaborg) (Finland) .. .. .		293.5	1022	2.6	Kosice (Czechoslovakia)	
574.7	522	0.7	Hamar (Norway) (Relays Oslo)		291	1031	13.2	Viipuri (Viborg) (Finland). (Relays Helsinki)	
574.7	522	7	Ljubljana (Yugoslavia) .. .. .		288.3	1040	50	Scottish National (Falkirk)	
568.1	528	2	Grenoble (France) .. .. .		288.3	1040	1	Bournemouth. (Relay Station)	
566	530	1.5	Hanover (Germany). (Relays Hamburg)		286	1049	0.8	Montpellier (France)	
563	533	16	Wilno (Poland). (Relay Station)		284.8	1053	0.7	Lyon (Radio-Lyon) (France)	
560	536	1.5	Kaiserslautern and Augsburg (Relay Munich)		283.6	1058	0.5	German Relays (Berlin, Magdeburg, Stettin)	
550	545	18.5	Budapest No. 1 Lakihegy (Hungary)		283.6	1058	0.5	Innsbruck (Austria). (Relays Vienna)	
542	554	10	Sundsvall (Sweden). (Relays Stockholm)		282.2	1063	2	Lisbon C1 IAA (Portugal). (Short-wave Station on 31.25 m.)	
537.6	558	3	Palermo (Italy) .. .. .		281.2	1067	0.75	Copenhagen (Denmark)	
533	563	60	Munich (Germany) .. .. .		278.8	1076	13.5	Bratislava (Czechoslovakia)	
525	571	15	Riga (Latvia) .. .. .		276.5	1085	60	Heilsberg (Germany)	
517.2	580	100	Vienna (Bisamberg) (Austria)		273.7	1096	7	Turin (Italy)	
509	589	15	Brussels No. 1, Velthem (Belgium). (In French)		271.5	1105	1.3	Rennes, PTT (France)	
500.8	599	20	Florence, IFI (Italy) (Relays Turin)		269.8	1112	20	Bari (Italy) (Relays Rome)	
495.8	605	1.2	Tröndelag (Norway) .. .. .		269.8	1112	1.5	Bremen (Germany). (Relays Hamburg)	
488.6	614	120	Prague (Czechoslovakia) .. .. .		267.6	1121	0.75	Valencia (Spain)	
480	625	50	North Regional (Manchester) .. .. .		267.4	1122	6.25	Nvireghaza (Hungary). (Relays Budapest)	
472.4	635	60	Langenberg (Germany)		265.8	1128.5	1.3	Lille, PTT (France)	
465.8	644	1.5	Lyons la Doua, PTT (France)		263.8	1137	11.2	Moravska Ostrava (Czechoslovakia)	
459.4	653	60	Beromünster (Schweizerischer Landessender) (Switzerland).		261.5	1147	50	London National and West National	
453.2	662		San Sebastian, EAJ8 (0.6 kW.); Pori (1.0 kW.) (Finland); Danzig (0.5 kW.) (relays Heilsberg); Klagenfurt (0.5 kW.) (Austria) (relays Vienna).		259.3	1157	17	Frankfurt-a.-M. (Germany)	
453.2	662	0.25	Agen (France) .. .. .		259.3	1157	2.3	Trier and Cassel. (Relay Frankfurt)	
451.8	664	20	Milan (Vigentino) (Italy). (Relays Rome)		257.1	1167	10	Hörby (Sweden). (Relays Stockholm)	
447.1	671	7	Madona (Latvia). (Relays Riga)		255.1	1176	0.7	Toulouse, PTT (France)	
441.2	680	50	Paris, Ecole Supérieure, PTT .. .. .		253.1	1185	5	Gleiwitz (Germany). (Relays Breslau)	
435.4	689	55	Rome, IRO. (S.-W. Station, 2RO on 25.4 m.)		252	1193	1	Barcelona, EAJ15 (Assoc. Nat.) (Spain)	
430.4	697	2.5	Stockholm, SASA (Sweden) .. .. .		249.6	1202	0.8	Juan-les-Pins, Nice (France)	
424.3	707	2	Belgrade (Yugoslavia) .. .. .		247.7	1211	10	Trieste (Italy). (Relays Turin)	
424.3	707	100	Madrid, EAJ7 (Union Radio)		245.9	1220		Berne (0.5kW.) (Switzerland) (relays Beromünster); Eskilstuna (0.2kW.), Säfte (0.4 kW.) (Sweden) (relays Stockholm); Linz (0.5 kW.) (Austria) (relays Vienna); Turku (Abo) (0.5 kW.) (Finland) (relays Helsinki).	
419.5	715	1.5	Moscow, Imini Stalina (Russia)		244.1	1229	0.5	Basle (Switzerland). (Relays Beromünster)	
416.4	720.5	5	Berlin, Funkstunde (Germany)		242.3	1238	1	Belfast (N. Ireland)	
413	725	60	Rabat (Morocco)		240.6	1247	0.5	Stavanger (Norway)	
408.7	734	16	Athlone (Irish Free State) .. .. .		239.9	1256	2	Nürnberg (Germany). (Relays Munich)	
403.8	743	25	Katowitz (Poland) .. .. .		238	1260	1	Nimes (France)	
398.9	752	25	Sottens (Radio Suisse Romande) (Switzerland)		237.2	1265	3	Bordeaux, Sud-Ouest (France)	
394.2	761	12	Midland Regional (Daventry)		235.5	1274	0.5	Kristiansand (Norway)	
389.6	770	120	Bucharest (Roumania)		233.8	1283	1.65	Lodz (Poland). (Relay Station)	
385.1	779	8	Leipzig (Germany) .. .. .		232.2	1292	0.25	Kiel (Germany). (Relays Hamburg)	
385.1	779	10	Toulouse (Radiophonie du Midi) (France)		230.6	1301		Sweedish Relay Stations	
381	788	16	Stalino, RV26 (Russia) .. .. .		227.4	1319	0.5	Flensburg (Germany). (Relays Hamburg)	
376.4	797	50	Lwow (Lemberg) (Poland) .. .. .		225.9	1328	10	Fécamp, Radio-Normandie (France)	
372.2	806	1.5	Scottish Regional (Falkirk)		224.4	1337	1	Cork (Irish Free State)	
370.1	810.5	0.8	Hamburg (Germany) .. .. .		219.9	1365	1.5	Béziers (France)	
368.1	815		Radio, LL, Paris .. .. .		218.5	1373	0.2	Plymouth	
			Seville, EAJ5 (Union Radio) (1.0 kW.); Galicia EAJ4 (0.2 kW.) (Spain); Bolzano (1.0 kW.) (Italy); Helsinki (10 kW.) (Finland) (relays Lahti); Kharkov, RV20 (10kW) (Russia).		218.5	1373	0.5	Salzburg (Austria). (Relays Vienna)	
					217	1382	0.5	Königsberg (East Prussia). (Relays Heilsberg)	
					214.3	1400	1	Aberdeen	
					211.3	1420	1	Newcastle	
					209.8	1430	1.25	Magyarovar, Miskolc and Pecs (Hungary)	

# SHORT-WAVE STATIONS OF THE WORLD

(N.B.—Times of Transmission [as from October 8th], given in parentheses, are approximate only and represent G.M.T.)

Metres.	kc/s.	Call Sign.	Station.	Tuning Positions.	Metres.	kc/s.	Call Sign.	Station.	Tuning Positions.
62.56	4,795	VE9BY	London, Ont. (Canada). (Sun. 06.00) ...		31.54	9,510	GSH	Empire Broadcasting, Zones 2, 4, 5 ...	
58.31	5,145	OK1MPT	Prague (Czechoslovakia). (Tues. and Fri. 19.30) ...		31.48	9,530	W2XAF	Schenectady, N.Y. (U.S.A.). (Relays WGY) ...	
54.52	5,502	W2XBH	Brooklyn, N.Y. (U.S.A.). (Relays WCGU) ...		31.38	9,560	DJA	Zeesen (Germany). (Daily 22.00) ...	
51.22	5,714	XDA	Chapultepec (Mexico) ...		31.35	9,570	W1XAZ	East Springfield, Mass. (U.S.A.). (Relays WBZ) ...	
50.26	5,970	HVJ	Vatican State, Rome. (Daily 19.00) ...		31.3	9,580	HBL	Radio Nations, Prangins (Switzerland). (Sat. 22.30-23.15) ...	
50.0	6,000	RW59	Moscow. (Relays Komintern Stn.) ...		31.29	9,585	GSC	Empire Broadcasting, Zone 3 ...	
49.83	6,020	EA125	Barcelona, Radio Club (Spain). (Sat. 20.00) ...		31.28	9,585	W3XAU	Philadelphia, Pa. (U.S.A.). (Relays WC AU) ...	
49.67	6,042	W4XB	Zeesen (Germany) ...		31.25	9,598	CT1AA	Lisbon (Portugal). (Tues. and Fri. 22.00-00.00) ...	
49.6	6,048	W3XAU	Miami Beach, Florida (U.S.A.) ...		31.0	9,675	T14NRH	Heredia (Costa Rica). (Daily 22.00 and 02.00) ...	
49.58	6,050	GSA	Philadelphina, Pa. (U.S.A.). (Relays W C AU) ...		30.0	10,000	FAQ	Arunjuez (Spain). (Daily 23.30, Sat. 20.00) ...	
49.5	6,060	VQ7LO	Empire Broadcasting, Zones 4-5 ...		28.98	10,350	LSX	Buenos Aires (Argentina). (Daily 20.30) ...	
49.5	6,060	W8XAL	Nairobi (Kenya Colony). (Daily 16.30) ...		28.83	11,180	CT3AQ	Funchal (Madeira). (Tues. and Thurs. 10.30-12.30) ...	
49.43	6,060	VE9CS	Mason, Ohio (U.S.A.). (Relays WLW) ...		25.63	11,705	FYA	Pontoise (France). (Colonial Stn. E-W, daily 20.30) ...	
49.34	6,080	W2XCX	Vancouver, B.C. (Canada) ...		25.6	11,720	VE9JR	Winnipeg (Canada). (Daily ex. Sat. and Sun. 17.45) ...	
49.22	6,095	VE9GW	Kearny, N.J. (U.S.A.). (Relays W OR) ...		25.53	11,750	GSD	Empire Broadcasting, Zones 1 and 4 ...	
49.2	6,098	ZTJ	Bowmanville, Ont. (Canada). (Daily 20.00) ...		25.5	11,760	XDA	Chapultepec (Mexico). (Daily 20.00) ...	
			Johannesburg (S. Africa). (Weekdays 09.00 and 14.00 [Sat. 14.30] and 17.00, Sun. 13.00 and 16.30.) (Temporarily suspended) ...		25.5	11,760	DJD	Zeesen (Germany) ...	
			Bound Brook, N.Y. (Relays W J Z) ...		25.45	11,790	W1XAL	Boston, Mass. (U.S.A.) ...	
			Calcutta, India. (Daily 13.00) ...		25.4	11,810	2RO	Prato Smeraldo, Rome. (16.15-23.30) ...	
			Wayne, N.J. (U.S.A.). (Relays W ARC) ...		25.36	11,830	W2XE	Wayne, N.J. (U.S.A.). (Relays W ABC) ...	
			East Pittsburg, Pa. (U.S.A.). (Relays KDKA 21.19-06.00) ...		25.34	11,840	W9XAA	Chicago, Ill. (U.S.A.). (Relays WCFL) ...	
			Winnipeg (Canada). (Daily ex. Sun. 00.30) ...		25.28	11,865	GSE	Empire Broadcasting, Zone 2 ...	
			Bogota (Colombia). (Daily 15.00) ...		25.27	11,870	W8XK	East Pittsburg, Pa. (U.S.A.). (Relays KDKA 21.19-03.00) ...	
			Rome (Italy) ...		25.14	11,933	FYA	Pontoise (France). (Colonial Stn. N-S) ...	
			Barranquilla (Colombia). (Weekdays 23.45) ...		23.38	12,830	CNR	Rabat (Morocco). (Sun. 12.30) ...	
			Casablanca (Morocco). (Relays Rabat) ...		20.5	14,630	XDA	Chapultepec (Mexico). (Daily 19.30) ...	
			Quito, Ecuador. (Daily 01.00) ...		19.9	15,075	T14NRH	Heredia (Costa Rica). (Sat., Sun., Mon. 16.00 and 21.00) ...	
			Bound Brook, N.J. (U.S.A.). (Relays W J Z irregular) ...		19.84	15,120	HVJ	Vatican State, Rome. (Daily 11.00) ...	
			Moscow. (Relays Stalin Stn.) ...		19.81	15,140	GSF	Empire Broadcasting, Zone 5 ...	
			Constantine (Algeria). (Mon. and Fri. 22.00) ...		19.73	15,200	DJB	Zeesen (Germany). (Daily 13.00-22.30) ...	
			Guatemala City (Central America). (Daily 03.00) ...		19.72	15,210	W8XK	East Pittsburg, Pa. (U.S.A.). (Relays KDKA 15.00-21.18) ...	
			Radio Vltus, Paris. (Daily 20.30) ...		19.68	15,244	FYA	Pontoise (France). (Colonial Stn. E-W) ...	
			Madrid. (Tues. and Sat. 22.30) ...		19.57	15,330	W2XAD	South Schenectady, N.Y. (U.S.A.). (Daily 20.00) ...	
			Singapore (Malay States). (Sun. and Wed. 15.30) ...		18.9	17,750	HSP	Bangkok (Siam). (Sun. and Tues. 21.00) ...	
			Radio Nations, Prangins (Switzerland) (Sun. 22.00-22.45) ...		18.89	17,760	DJE	Zeesen (Germany) ...	
			Radio Nations, Prangins (Switzerland). (Sat. 22.30-23.15) ...		18.87	17,800	W3XAL	Bound Brook, N.J. (Weekdays 13.00) ...	
			Rabat (Morocco). (Sun. 21.00) ...		18.86	17,900	GSG	Empire Broadcasting, Zone 2 ...	
			Guatemala City (S. America) ...		18.57	18,105	W9XAA	Chicago, Ill. (U.S.A.). (Relays WCFL) ...	
			Rio de Janeiro (Brazil). (Daily 21.30) ...		13.97	21,470	GSH	Empire Broadcasting, Zone 3 (Daylight working) ...	
			Melbourne (Australia). (Wed. and Sat. 10.00) ...		13.92	21,540	W8XK	East Pittsburg. (12.00-19.00) ...	

## ON THE SPOT

### Visits to Foreign Broadcast Stations

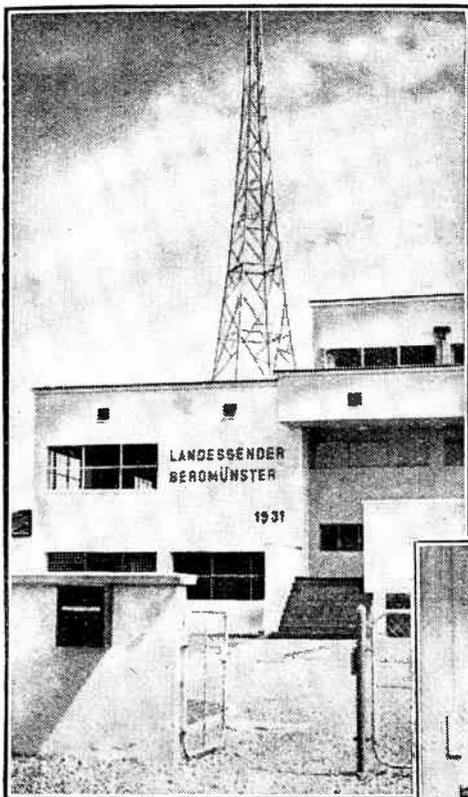
#### X—Beromünster (653 kc/s, 459.4 metres ; 60 kW.)

That there are three official languages in Switzerland has naturally complicated the broadcasting arrangements; hence we have German, French and Italian speaking stations. I am now concerned with the German-speaking station—the "Schweizerischer Landesender"—situated at Beromünster, midway between Zurich and Lucerne.

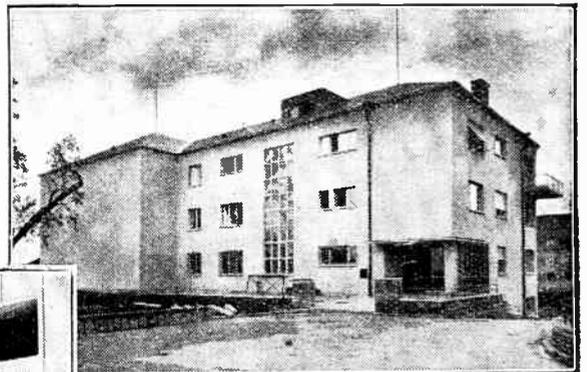
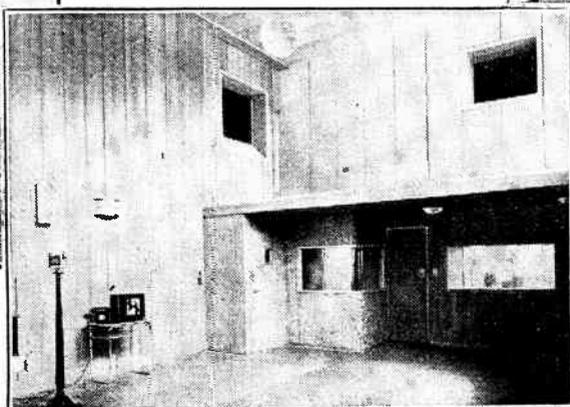
The principal point of interest in connection with this station is the ultra-modern "Broadcasting House" which has been opened at Zurich, from which programmes are relayed to Beromünster. Dr. Job, the kindly station director, showed me over the new premises. The main studio accommodates an audience of sixty and includes an organ. There is a smaller

studio for radio drama, while the smallest—the Talks studio—is a combination of announcer's cabin and gramophone compartment. It is situated on the first floor, and gives a clear view through glass windows into the two other studios, which are double-deckers.

In contrast, the Berne studios comprise the back rooms of a villa close to the railway station! On reaching the studios one must



The transmitter is actually at Beromünster whilst the studios are situated in the "Broadcasting House" at Zurich, some distance away. One of the studios and the new headquarters building are shown on the right



pass through the basement of the house. However, the arrangement is economical, and is said to be efficient.

Basle, which also contributes to the Beromünster transmissions, has what are probably the most beautifully situated studios in Europe. They are in a private mansion in the centre of a park.

Beromünster, where the transmitter is located, is renowned for its famous church, or minster. With its 60 kW output, the station is one of the most "reliable" in Europe, and one can generally depend upon a good programme. "WANDERING WAVE."

# BROADCAST BREVITIES

By Our Special Correspondent

## Plenty of Time, Gentlemen

IN bars and places where they drink there has been uncalled-for alarm over the recent Court decision that the Performing Right Society can claim against those who rediffuse copyright music by loud speaker in public places.

Just at the moment the Performing Right Society is enforcing no rights, for the simple reason that the tariff of annual licences has yet to be worked out.

## A Mathematical Problem

It involves no light mathematical calculation to discover what is the indebtedness of the proprietor of the "Blue Pig," Little Twittinger, to Sir Edward Elgar when the Enigma Variations weave their spell among the shining pump handles.

## Where the "P.R.S." Steps In

Mr. Leslie Boosey, the well-known music publisher, and chairman of the Performing Right Society, assured me last week that the public need not imagine that the Society has any idea of "frightening people."

"When the tariff has been worked out," Mr. Boosey told me, "we shall then be prepared to come to terms with all who wish to avail themselves of the Society's licence."

## What the Society Does

I was surprised to learn that the "P.R.S.," as it is familiarly called, was formed only after nearly all the countries of Europe already had organisations of the kind.

These societies exist for the purpose of collecting fees due to publishers, composers, and other proprietors of copyright works who would never individually be able to secure their just dues because of the multiplicity of performers and performances all over the world.

## How the Scheme Works

If, for example, Mr. Alphonso Blank, of Balham, composes a minuet which is broadcast from Brno, the local "P.R.S." notifies the British organisation, which then collects the fee due to Mr. Alphonso Blank and hands it to the composer.

All this is on the assumption, of course, that Mr. Blank is a member of the "P.R.S."

## Exempt

One last word on this important subject. The Performing Right Society has no intention of extracting fees from wireless dealers, charity bazaar organisers, or street musicians.

"If we did, we should be making a rope for our own necks," said Mr. Boosey.

## Home of Mystery

I APOLOGISE to readers for missing the bull's-eye last week when I said that the B.B.C. were negotiating for the Small Queen's Hall as a vaudeville studio to succeed "No. 10." Actually, the Corporation has gone next door and taken a short lease

of St. George's Hall, the Maskelyne Home of Mystery.

The first vaudeville show from the new "studio" may be expected in about a fortnight's time.

## Pitfalls?

Mr. Maschwitz's Eight Step Sisters have been told to tread lightly on account of the peculiar nature of the building. The stage is alive with trap doors and quick-vanishing gadgets, and even the announcers will have to watch their pockets.

It would be highly inconvenient during the reading of the news bulletin to feel for one's handkerchief and withdraw a rabbit instead.

## Big Plans for Maida Vale

In the meantime, the B.B.C. is still negotiating for those immense premises in Delaware Road, Maida Vale, in the hope of transforming the place into a permanent vaudeville studio.

In all probability the old skating rink will require to be rebuilt. The B.B.C. may take advantage of this fact to add extra floors in order to provide one large hall in addition to a restaurant, green rooms, and a certain amount of office accommodation.



THE NEW B.B.C. "STUDIO." A recent view of St. George's Hall, long famous as the Maskelyne Theatre of Mystery. It will fill a new role towards the end of this month when the B.B.C. takes it over on a short lease as the successor to "No. 10," the wharf studio beside Waterloo Bridge. St. George's Hall is small and should prove excellent for vaudeville broadcasts.

## "Circus Princess" in the Concert Hall

IN the broadcast performance of Kalman's operetta, "The Circus Princess" (October 26th and 27th), the leading part will be played by John Hendrick. Although he has been given a number of broadcast engagements, this will be his first "star" part. The Princess will be Harriet Bennet, never yet heard in England, but the possessor of a big reputation in America and Australia, where she has sung "Rose Marie" for two years. The Variety Director has decided to use the Concert Hall at Broadcasting House for the "Circus Princess," as he did for one previous musical play, namely, "Waltz Time."

## What the Organ Can Do

MR. J. I. TAYLOR'S programme of improvisations on the organ at Broadcasting House last month will be recalled as a remarkable demonstration of the capabilities of this instrument when one of its creators is at the console. On November 5th Mr. Taylor is to give further improvisations: his programme will last half an hour.

## A Hint to the B.B.C.

IT is to be hoped that the B.B.C. will not abandon the 30-line television tests when the Baird agreement ends on March 31st next.

By all means let us have the 120- and 180-line tests which Electrical and Musical Industries are to broadcast from Portland Place, but it would be a pity if members of the public with the older type of gear were left without any transmissions to work upon.

## High Definition Tests

The high definition tests will start almost immediately, but it is emphasised that these are intended primarily for engineers and experimenters.

The first series of tests will be with apparatus installed by Baird Television, Ltd., and will go on to the end of the year. The second series of tests, beginning in January, will be with the apparatus of Electric and Musical Industries, Ltd., which was demonstrated to the B.B.C. in December, 1932.

## Put on Record

THERE is always a peculiar relish about the repetition of a likeable programme, especially when the listener can hold his own "command performance" on the gramophone. The Columbia Graphophone Co., Ltd., took an enterprising step last Saturday when "C. B. Cochran Presents" was broadcast by the National transmitters. On the same day a record was issued of the performance by Mr. Henry Hall and the B.B.C. Dance Orchestra, and actually including Delysia, Peggy Wood, and Mary Ellis in their original numbers as they sang them in Mr. Cochran's show.

Good programmes will stand this sort of thing, and I hope the custom grows.

## Mrs. Giles Borrett

NOW that the excitement concerning the B.B.C.'s lady announcer has died down, it is worth while asking why the B.B.C. refused to confirm or deny the story as it appeared in the *News-Chronicle* of Monday last.

Whenever anything unusual happens the B.B.C. officials invariably make that exasperating reply: "We have no statement to make." One could understand the retort if Broadcasting House were razed to the ground, but in the case of the woman announcer . . . ?

# Delayed Speech

## A New Method of Producing Echo Effects

By C. N. HICKMAN, Acoustical Research, Bell Telephone Laboratories

**I**N any form of speech transmission some delay is involved because a definite time is required for the transmission. This applies whether the speech travels directly through the air or, converted to electrical currents, passes over wires. In air, sound travels at a rate of about 1,100 feet per second, so that if you stood 1,100 feet from a person who was shouting to you it would be one second after a sound left his lips before it reached your ears. The speed of electrical transmission is much greater; under some conditions approaching that of light. Electrical circuits may be designed, however, to have quite an appreciable delay, and such circuits have been found very helpful at times in improving telephone communication.

Where the delay required is short, less than a hundredth of a second, electrical delay networks are economical and very satisfactory. Their cost for longer delays, however, becomes excessive, so that when delays of the magnitude of one second or more are required other means of securing them must be sought.

One method takes advantage of the relatively low velocity of sound in air. The electrical speech currents are converted to sound by a telephone receiver, and then the sound is allowed to travel in a tube long enough to bring about the delay desired. At the far end of the tube the sound is reconverted to electrical speech currents by a transmitter. Such acoustical delay circuits have been built, and used to some extent, but their size alone is sufficient to make them undesirable for most purposes.

### Mechanical Delays

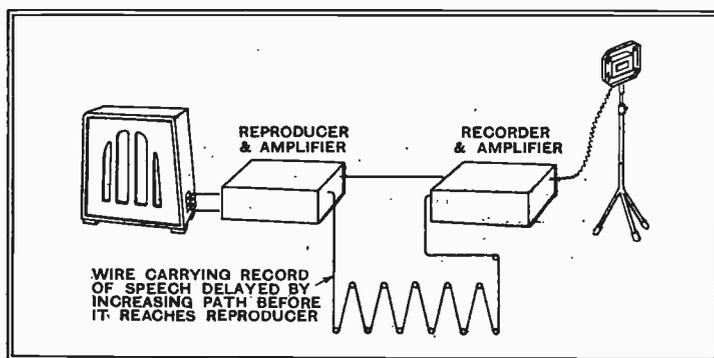
Another method of introducing an appreciable time of transmission is by the use of mechanical delay circuits. Such a delay circuit has been demonstrated by Mr. S. P. Grace in America in many talks, and consists of a long coiled spring suspended from its two ends. In this case the electrical speech currents are converted into mechanical vibrations which pass along the coiled spring at a relatively low speed, and are reconverted into electrical currents at the distant end. This method also has certain objectionable features which make it unsatisfactory for general application.

Still another method of obtaining delay, where the actual time introduced may be

of almost any long duration, with equal facility, is to record the sound either on a photographic film or on a wax disc, and to reproduce it from the record after the desired delay period. This method is ordinarily looked upon as storing rather than delaying because there is no transmission time involved. The overall effect is the same, however, and where very long delays are required the method is very useful.

### The New System

So far, therefore, there are very satisfactory methods of securing delays of very short duration and of very long duration. Until recently, however, there has not been any very satisfactory method applic-



Schematic diagram to illustrate the new process. Any delay required can be obtained by altering the length of the recording wire loop.

able to the intermediate field. Although photographic or disc recording would meet the electrical requirements, the amount of apparatus required is rather more than is desirable. A method has recently been developed by Bell Telephone Laboratories in America, however, by which delays of any value from a fraction of a second to several minutes, or even more, if necessary, may be obtained by the use of apparatus very simple to set up.

Like the photographic and disc method, it is essentially a recording and reproduction, but requires no intermediate process. It utilizes the principle of magnetic recording suggested by Poulsen over thirty years ago. A thin steel tape is passed between the poles of a pair of small electromagnets at a speed of about one foot per second. The speech current is flowing through the windings of these magnets, and producing a varying magnetisation in the steel tape which corresponds to the speech current. At a short distance from these recording magnets, depending on the delay to be

*HERE is an interesting description of a new method of producing a delay in speech and other transmissions. The scheme is suitable for producing echo and other effects so often required in broadcasting and in the theatre.*

secured, is a second and exactly similar set of magnets. As the steel ribbon, already magnetised in conformity with the voice currents, passes between the poles of this second set of magnets, it induces voice currents in their windings corresponding to the magnetic pattern and thus to the original voice currents. In the circuit of the second set of magnets there are thus voice currents practically identical with those in the circuit of the first set, but following them after a number of seconds equal to the distance between the magnets in feet.

One of the great advantages of this method, in addition to the smallness and simplicity of the equipment, is that the magnetism in the tape may be completely removed by passing the tape through a strong unvarying magnetic field. A set of magnets for eliminating the speech record from the tape is mounted just beside the recording magnets. This enables the same piece of tape to be used over and over again. By making the tape in the form of a loop, long enough to produce the required delay, the speech may be recorded on the tape, delayed the required interval, and then reproduced. After this the record will be wiped out by the restoring magnets, and this process can be repeated indefinitely. Photographic or disc methods do not lend themselves so readily to this continual re-recording.

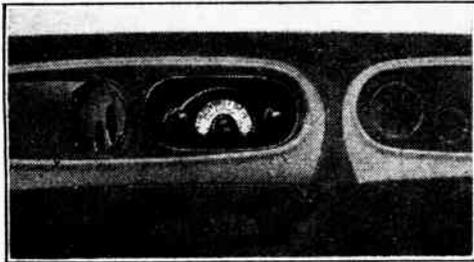
### Creating an Echo

At an exhibition in Chicago a concealed microphone was in a position where visitors could speak to observe the echo, connected to the circuit of the recording magnet. Hidden in the wall some distance away was a loud speaker associated with the reproducing magnets. Two seconds after a visitor had spoken a few words into the microphone the loud speaker repeated them to him. The effect was like that of an echo from a cliff a thousand feet away, except that the sound returned not only increased rather than diminished in strength but also without appreciable distortion, whereas in the usual echo effects the distortion may make speech unintelligible.

# At the Motor Show

## Car Radio Sets Again in the Limelight

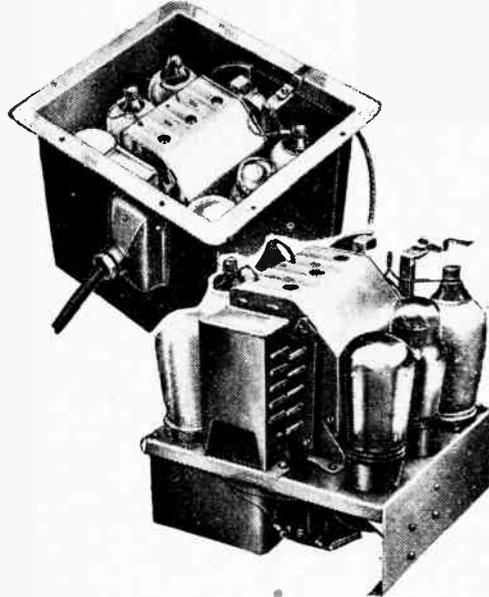
**A**LTHOUGH the Olympia Motor Show has not—as yet—become a subsidiary wireless exhibition, radio equipment for cars is very much in evidence at this year's show. Even when no set is actually fitted, provision is sometimes made for it; for instance, all the 1934 saloon models produced by the Hillman and Humber concerns are supplied ready equipped with concealed roof aerials and a spare pair of power leads. This applies even to the low-priced Hillman Minx. Similarly, M.G. saloon cars are fitted with aerials, and a standard Philco set is installed on the M.G. Magnette.



An Ekco Superhet on the instrument board of an Austin Sixteen.

A British-made Ekco receiver is to be seen on the Austin stand, where it is very neatly installed on the instrument board of a "Sixteen," and is also in evidence on stands occupied by coachbuilders. Hudson-Essex were exhibiting a Majestic receiver, which can be fitted in the Sedan de Luxe models of the Terraplane Big Six or Eight.

As for the sets themselves, those at present available in this country may be divided into two main categories. First we have a



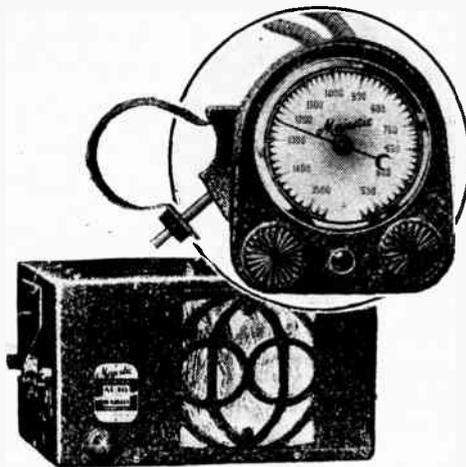
The Lissen receiver in its case, and (below) the bare chassis.

set that is intended to be directly controlled, and must therefore be so mounted that the tuning knobs, etc., are within reach of the operator's hand. This means that the choice of position is limited, but there are, of course, other compensating advantages. Remotely controlled sets, in which the tuning condenser, etc., is operated through a

Bowden wire or similar mechanism, may be installed in almost any position, especially when the loud speaker is supplied as a separate unit. In some of the newer sets there is a tendency to mount the loud speaker in the receiver itself.

One of the best known of the directly controlled car sets is the Ekco model, which was exhibited at the Radio Show. This is a compact version of the Type 74, and embodies a superheterodyne circuit with automatic volume control. Valve heaters are fed from the car battery, which also supplies anode current through a rotary converter. As yet, the Ekco receiver is only available for motor manufacturers.

The Sunbeam Midget, described in our Olympia Show number, has just made its appearance, in a slightly modified form, as a directly controlled car set, at the extremely attractive price of seven guineas only. A straight four-valve circuit, with one H.F. stage, a screen grid detector, inter-



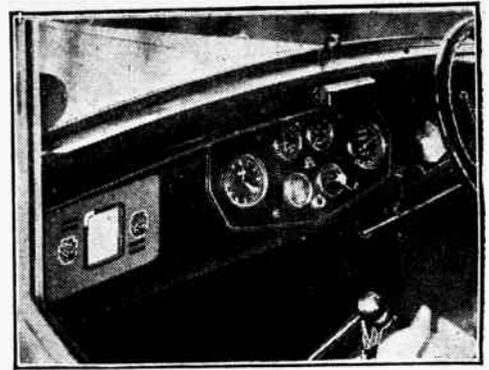
Majestic car set and remote control unit.

mediate L.F. amplifier, and pentode output is employed. The speaker is housed in the set, which is consequently self-contained, except for the H.T. supply system. Anode current may be derived either from a 99-volt dry battery or from a generator.

The larger remotely controlled Philco "Transitone" set, with loud speaker and H.T. generator as separate units, is retained, but a somewhat less ambitious set has recently been introduced. This model has a four-valve superheterodyne circuit with A.V.C.; anode current is derived from the car battery through a vibratory transformer device, and is rectified by a fifth valve. Both the H.T. generator and the loud speaker are mounted in the set.

The technical features of the five-valve superheterodyne (with Westector A.V.C.) made by Page Car Radio have already been described in this journal. Remote control and a separate speaker unit are provided; apart from this set, the firm specialises in car radio equipment generally, including the suppression of interference.

A "straight" circuit with three H.F. stages and Class "B" output is used in the Lissen receiver, which also covers both wavebands and derives its H.T. either from a battery or a generator. The three units comprising the equipment are the set proper,



The Sunbeam directly-controlled receiver.

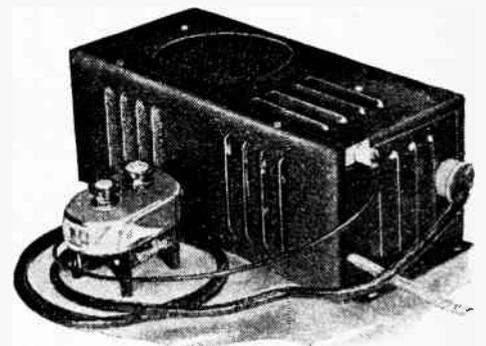
the loud speaker, and a particularly convenient control device on the steering column. Lissen sets were seen on Chrysler and Dodge cars at Olympia, and are also fitted on Ford cars at the Albert Hall, where demonstrations are being given.

In the Majestic Superheterodyne a total of six valves, including a rectifier, are employed. Almost as a matter of course in this class of set, automatic volume control is employed, while the single-valve frequency changer is of the Pentagrid type, a double-diode-triode being employed as a second detector. The high tension generator is of the vibratory type, and, with the loud speaker, is included in the set.

Another five-valve superheterodyne, the Peerless, employs a screened pentode as a combined detector-oscillator, and embodies a total of five tuned circuits. An energised loud speaker and a vibratory H.T. generator are, again, fitted in the receiver itself. The same firm produces a six-valve model.

Naturally, everyone who installs a car radio set of the type under discussion will expect that it should be capable of functioning while the vehicle is in motion. It is therefore necessary to take steps to prevent interference from the electrical equipment of the car. This interference will generally yield to fairly simple treatment, but suppressor resistances are always required.

A number of firms are now producing special equipment for this purpose. Resist-



The complete Peerless receiver.

ances of suitable design, and in a form which makes it easy to attach them to the plugs, are available from Eric, Dubilier, Rothermel, etc., while T.C.C. produces a special design of by-pass condenser. As an alternative to the use of plug resistors, special Champion plugs, with built-in resistors, may be used.

Rotary converters, wound for both 6-volt and 12-volt inputs, and delivering more than sufficient H.T. output for any car set, are now produced by the Electro-dynamic and M-L concerns.

## Letters to the Editor:—

# The Photo-Electric Gramophone

## Double-channel Transmission : Empire Receivers : Filter Design

The Editor does not hold himself responsible for the opinions of his correspondents

### The Photo-Electric Gramophone

MAY I use your columns to ask a very pertinent question: where is the photo-electric gramophone? As long ago as February 4th, 1931, an instrument called a "Selenophone" was described in *The Wireless World*, but neither this nor any other form of photo-electric reproducer for home use seems to have come upon the market. Yet the photo-electric "sound head" of one sort or another is used on every talking film projector, and the Blattnerphone-Stille apparatus is operated daily by the B.B.C. Why, then, do the big gramophone combines still limit the home consumer to the old-fashioned and inefficient disc for his "potted music?"

Much misplaced ingenuity has been wasted on designing automatic record changers, but such mechanisms are only palliatives, and remarkably poor ones, for the deep-seated disease of the disc reproducer, namely, the inability to play any but the shortest pieces of music through without interruption. Even after the recording companies have gone to the trouble of issuing special pressings of symphonies, etc., so that the wretched one-sided record changer can do its work to the best of its poor ability, there still remains the pause while the machinery whirrs and another disc drops with a thud. To anyone with the slightest musical feeling these continual breaks are simply maddening. Pauses are not tolerated in the talking picture theatre where every proprietor is forced to have at least two projectors; why should not the far greater art of music receive at least the same consideration?

I am a keen amateur of music and have studied it all my life. Of late the electric reproducer of sound has become fit for a sensitive ear to listen to. It now remains to make the gramophone into a musical instrument which will play a whole symphony or an act of an opera without any break whatever. Why have not the gramophone companies produced such an instrument? I strongly suspect them of deliberately buying up all inventions of the kind I have mentioned in order to keep them off the market. Are they afraid that they are going to lose money on the scrapping of their existing equipment? There is no need for the change to be sudden, but the change has got to come sooner or later. In the past, the gramophone companies have underrated the musical taste of the public and have hesitated to make complete recordings of standard works until private societies showed them that it could be done at a profit. Musicians have agreed that the present day reproduction is fit to bring the gramophone into the class of musical instruments; but they are already demanding more than this. Let the big companies look to it that they are not outstripped by independent enterprise. PATRICK KING, Baghdad. Flight-Lieut., R.A.F.

### Double-channel Transmission

MAY I raise a query in reference to double-channel transmission?

In your issue of September 29th Mr. R. B. Ransome writes happily of two separately operated speakers, side by side in the same cabinet, and your leader also refers to *two loud speakers*.

Surely, with the type of loud speaker in use nowadays, the only way to reproduce binaural hearing is by means of headphones: one receiver for each channel.

This, I confess, is the only method I have used, as the possibility of using loud speakers seems theoretically out of the question. J. J. Y. SCARLETT.

Beaconsfield.

### Commercial H.F. Receivers

OWING to the fact that many parts of the tropics have A.C. mains it would appear that manufacturers might seriously consider building somewhat more ambitious receivers than heretofore, especially as regards the output which is usually 2,000 m/Watts undistorted—hardly enough when it is realised that rooms are usually larger than at home and that windows and doors are open, this latter condition having the effect of reducing the apparent volume. As to the high frequency or signal portion of the receiver, it is becoming increasingly obvious that a pre-selector stage is a *sine qua non* nowadays. Reception of Empire transmissions is, on the whole, extremely satisfactory and this, together with my experience that many people complain of receivers not being powerful enough, prompts these remarks.

E. T. SOMERSET,  
Ex-G2DT.

Mombasa.



The "Utility" Home Safe is a product of the well-known firm of Wilkins & Wright. It may be used for collecting the 'installments' for wireless purchases.

### A Less Effective Filter

UNDER this heading on page 296 of your issue of October 6 we note a warning to readers against fitting less perfect forms of heterodyne-whistle, or sideband-splash filters in the new Monodial Super-heterodyne receiver. We fully endorse the view that the type of filter designed for this receiver should be adhered to by constructors, and it cannot be emphasised too strongly

that the all-too-common type of high-note attenuator, consisting of a resistance-capacity combination\* is vastly inferior to a properly designed filter. We hasten to assure you that our "Kinva" components are real filters, developed with the help of the latest audio-frequency test apparatus. Actual test curves are sent out with these new types, and with tests occurring at every stage of manufacture, the results indicated by these curves are guaranteed within very close limits. Readers may rest assured that not only are Kinva filters "proper" filters, but that the exceptionally steep characteristics presented this year ensure maximum filtration, with minimum quality attenuation.

p.p. POSTLETHWAITE BROS.,  
A. E. Postlethwaite.  
Kinver, Stourbridge.

\* It was, of course, this type which was referred to.—ED.

## THE RADIO INDUSTRY

The "All Metal Way," 1934 edition, issued by the Westinghouse Brake and Saxby Signal Co., Ltd., is an even more useful and comprehensive publication than its predecessors. In addition to full technical information on the use of Westinghouse metal power rectifiers, it deals with the applications of the new "Westectors" as high-frequency detectors, A.V.C. devices, and in battery-economy circuits. Readers may obtain copies by sending 3d. in stamps to the company at 82, York Road, King's Cross, London N.1.

As the recently introduced "Avominor" multi-range meter is such an obviously attractive accessory, it is hardly surprising to hear that the manufacturers are somewhat behind-hand with deliveries.

We are asked to tender their apologies to readers; it is hoped that the production will soon be abreast of demand.

Marconiphone announce that D.C. counterparts of their A.C. receivers, types 272 and 276, will be available on October 16th.

The 20-page "Multitone Guide to Class 'B'" deals with every aspect of the subject—historical, theoretical and practical. Free copies are available for readers interested in battery-economy circuits.

### Changes of Address

E. R. Morton, Ltd., the London agents for "Utility" radio components, from Bartlett's Buildings, Holborn, to 11, Newman Street, Oxford Street, London, W.1.

Radio-Aid, Ltd., from 4, Idlesleigh House, Caxton Street, London, S.W.1, to 45, Duke Street, London, W.1.

### Catalogues Received

Edison Swan Electric Co., Ltd., 155, Charing Cross Road, London, W.C.2.—Pamphlets dealing with B.T.-H. loud speakers and pick-ups; also Ediswan battery booklet and catalogue, the former giving much useful information on the use and maintenance of dry H.T. batteries.

Redfern's Rubber Works, Ltd., Hyde, Cheshire.—Leaflet describing panels and other articles in ebonite.

Electro Dynamic Construction Co., Ltd., Devonshire Grove, London, S.E.15.—Rotary converters, etc.

# A P O L O G Y



You may be disappointed by a little delay in obtaining your AvoMinor, but we ask your indulgence. It is entirely due to the overwhelming rush of orders for the first accurate combination testing instrument that has ever been put on the market at a reasonable price. We anticipated, and made provision for, an exceptional demand, but the success of the AvoMinor has surpassed our highest expectations. Orders are being filled in strict rotation, whilst energetic measures are being adopted to increase production. We would like to point out that, as the whole world has waited so long for an instrument capable of accurately carrying out so many tests as the AvoMinor, it is surely better to wait a little longer for the perfect, than to purchase a less reliable product.

## THE AVOMINOR

TRADE MARK

gives you the testing facilities of the most expert technical engineer. It is an ACCURATE moving coil combination testing instrument giving ten different ranges of readings in milliamps., volts and ohms. It tests everything. It means quick, accurate, easy detection of every possible fault. No other similar instrument makes so many tests with such accuracy. Ask your dealer about the AvoMinor, or write direct for descriptive literature.

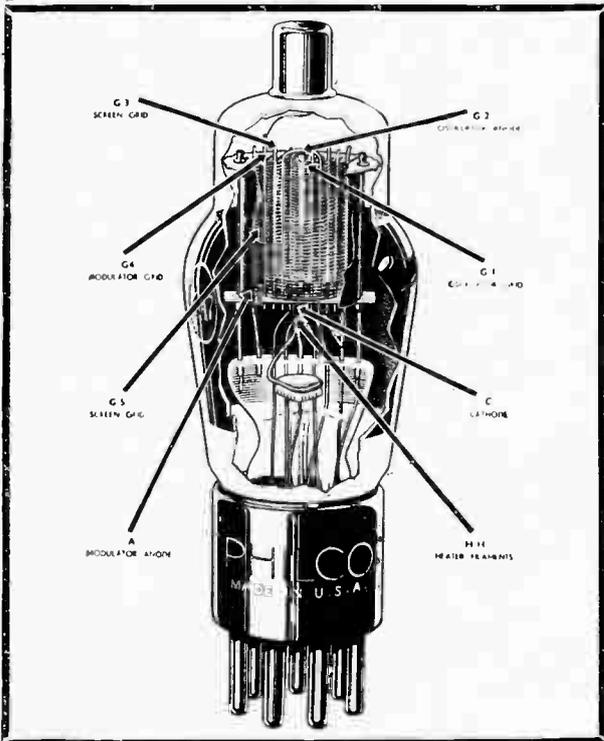
Complete in handsome case with pair of leads and interchangeable crocodile clips and testing prods.

**40/-**  
Deferred Terms  
if desired.

THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD., Winder House, Douglas St., London, S.W.1.

Phone: Victoria 3403-7

# PHILCO FOR VALVES



There are 3,500 Philco dealers distributed throughout the whole of Great Britain. Each one can supply any American type valve, old or new, 2.5 volt or 6.3 volt.

In particular, every dealer can supply immediately the type 6A7 Pentagrid Converter specified for "The Wireless World" Monodial D.C. Super, and the 2A7 type for the A.C. version of this set.

## GUARANTEED FOR THREE MONTHS

Philco valves are quite easily the most widely used valves in the world. They are made from start to finish in Philco's own valve factory—the largest in the world. They are tested and inspected with such thoroughness that every Philco valve of every type is guaranteed for 90 days. Yet the prices of Philco valves, type for type, are considerably lower than other makes.

## PENTAGRID CONVERTORS

(Specified for Monodial Super, A.C. and D.C. Models.)

TENTATIVE OPERATION	6A7	2A7
Fil. volts	6.3 v.	2.5 v.
Fil. amps.	.3 a.	1.75 a.
Anode volts	250 v.	250 v.
Screen (G3—G5) volts	100 v.	100 v.
Anode grid (G2) volts	250 v.	250 v.
G1 volts	-3 v.	-3 v.
G4 volts	-3 v. min.	-3 v. min.
Conversion Conductances <small>(Osc. Grid resistor 50,000 ohms, applied voltage as above)</small>		
G4 min.—3 volts	475 m/mhos.	475 m/mhos.
max.—42 volts	2 m/mhos.	2 m/mhos.
PRICE	<b>16/-</b>	<b>16/-</b>

THERE'S A PHILCO REPLACEMENT VALVE FOR ANY AMERICAN SET AT YOUR LOCAL PHILCO DEALER  
For full details, price lists and name of nearest dealer, write to The Philco Radio and Television Corporation of Gt. Britain Ltd. Aintree Road, Perivale, Middlesex

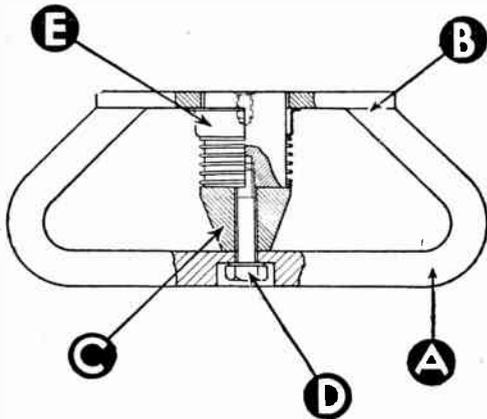
Advertisements for "The Wireless World" are only accepted from firms we believe to be thoroughly reliable.

**REFINEMENTS WHICH ARE OUTSTANDING IN THE DESIGN AND MANUFACTURE OF—**

*Darwin*

**PERMANENT MAGNETS FOR MOVING COIL SPEAKERS**

No. 2  
TWO-CLAW TYPE



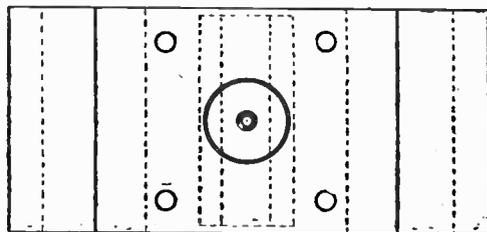
**A** Simple design having high magnetic efficiency.

**B** Welded outer pole by Patent process ensuring no distortion of gap due to shock.

**C** Patent pole-piece base, eliminating 'dead' material.

**D** Efficient centre - pole fixing ensuring mechanical accuracy of airgap.

**E** Patent dust cover to prevent entry of foreign matter into air-gap.



These details are given in order that manufacturers and designers of Speakers and Radio Receivers may be aware of the refinements which are essential features in the design and manufacture of Darwin Magnets. Each month a different type of Magnet will be illustrated.

*Our Technical Staff is always available to assist in solving any magnet problem, and can materially assist in economies in magnet steel for a given output and performance.*

*Darwins Ltd*  
**CORRECT MAGNET DESIGN**

Head Office: Fitzwilliam Works, SHEFFIELD.  
London Office: 29/31, Regent St., S.W.1.

**HELLESENS NEW HI-LIFE BATTERIES**



**50.2%**



**LONGER LIFE PROVED BY TEST**

A well-known British set-maker was placing large orders for Hellesens Hi-Life batteries. First he put them on test. The result of his test showed that their life was no less than 50.2% longer than any other battery working under identical conditions—a figure even greater than that shown by our own tests in the factory.

That is the result of over 40 years experience in the manufacture of dry batteries. Since 1887 Hellesens batteries have been the best in the world. Now the new Hi-Life batteries, the latest addition to the Hellesens range, have reached an even higher standard of performance than before, and are offered to you at a price competitive with any other quality battery.

**BRITISH MADE BY BRITISH LABOUR**

**HELLESENS**

**HI-LIFE BATTERY**

Hellesens Limited, Morden Road South Wimbledon, S.W.19.

Arks

*Mention of "The Wireless World," when writing to advertisers, will ensure prompt attention.*

# Practical HINTS and TIPS

THE simpler type of receiver is still dependent to a great extent on the use of reaction for its sensitivity; but, unfortunately, with modern detector valves operating at a high anode voltage, reaction control is not always so smooth and progressive as it might be. Indirectly heated A.C. valves are particularly likely to be deficient in this respect.

## Smoother Reaction

When connected in the usual way rectification efficiency may be quite high, but the operating conditions of the grid circuit may be unsuitable for smooth reaction.

In order to avoid reaction backlash, and thus to improve overall sensitivity, a compromise may be made by applying a small negative voltage to the detector grid; this voltage can only be determined experimentally, and should be just sufficient to give smooth reaction without noticeably impairing the operation of the detector. A

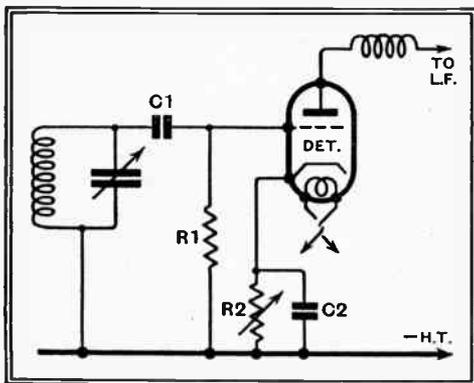


Fig. 1.—Improving reaction control by adjustment of detector-operating conditions. C1 and R1 represent the usual grid condenser and leak.

convenient way of applying this voltage is illustrated in Fig. 1; here a variable resistance, R2, of about 200 ohms is inserted in the detector cathode lead, and across it is shunted a by-pass condenser of 1 or 2 mfd.

Constant adjustment of the resistance will not be required, and so it may be of the semi-variable variety. This method of improving reaction will be found greatly superior to the alternative of reducing detector anode voltage.

MICROPHONES designed for connection to the pick-up terminals of a receiver, in such a way that the L.F. circuits may be used as a speech-frequency amplifier, are now available from many sources. Many, if not all, of these instruments have surprisingly good characteristics, considering their cheapness, and no doubt many readers will be considering their use as "deaf-aid" appliances.

## Microphone-Speaker Reaction

For the benefit of those without pre-

## AIDS TO BETTER RECEPTION

vious experience of microphones and speech amplification it should, perhaps, be pointed out that acoustic reaction between microphone and loud speaker is likely to give trouble when both instruments are mounted in the same room.

Unless adequate acoustic screening can be provided it is always safest to arrange for the deaf person to listen through headphones, as the trouble can then hardly arise.

ON the medium broadcasting waveband a frequency range of roughly 1,000 kc/s is covered by the average receiver. It therefore follows that with "straight-line frequency" tuning, stations spaced from each other by 9 or 10 kc/s would be separated on a "0-100" tuning dial by almost exactly one division.

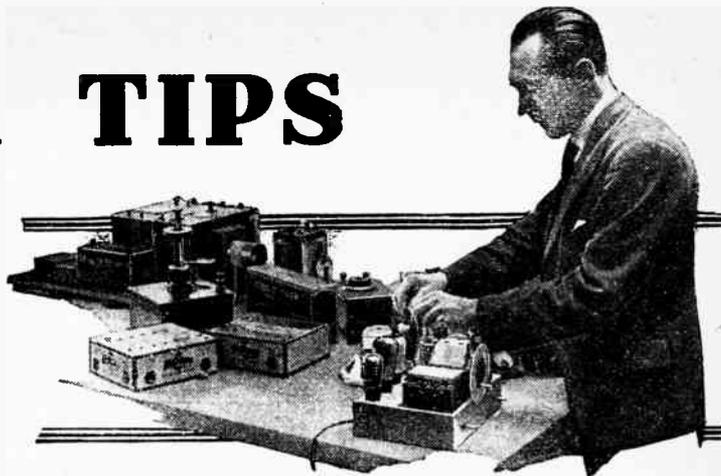
## Finding Elusive Stations

Actually, modern ganged tuning condensers are not exactly "straight-line frequency," but when searching for an elusive transmission it is helpful to remember that a division will correspond roughly to a channel. With a 0-180 degree dial the spacing between channels is slightly under two degrees.

On the long broadcasting waveband, the apparent sharpness of tuning is much less, as a total frequency band of only about 150 kc/s per second is covered. This means that, allowing for 9 kc/s separation, there will be a space of about four divisions between adjacent stations on a 0-100 dial.

IN order to prevent the pick-up of hum and other forms of interference it is sometimes an advantage to run loud speaker extension leads with screened cable, the metallic shielding of which is, of course, earthed, preferably at more than one point. But it should be borne in mind that screened extension leads are bound to have a fairly high capacity, and so there is a risk that high-note loss may take place; accordingly, screening should not be used indiscriminately. It should only be employed when hum is troublesome and when the addition of screening effects a definite improvement.

## Disadvantages of Screened Leads



STRICTLY speaking, the modern battery economy circuits should not be employed when mains are available; at any rate, very special precautions are necessary when the anode supply is drawn from A.C. mains through a rectifier. But, due to the better regulation of a D.C. supply, it is possible, at no very great expense or trouble, to obtain quite good results.

## Q.P.P. and Class "B" Eliminator

The knowledge that this can be done is particularly likely to be useful to those who have a D.C. supply not in excess of 150 volts, and who wish to modify an existing receiver and eliminator without incurring any very great expense or trouble.

In order that the H.T. voltage on the output valve or valves may remain sensibly constant in spite of varying demands brought about by changes in modulation, it is necessary that the D.C. resistance of the smoothing system should be low. The ordinary eliminator does not satisfy this requirement, but, due to the fact that a very small amount of smoothing is needed for output stages of the type under consideration, it is easy to introduce a satisfactory modification by providing a separate smoothing system.

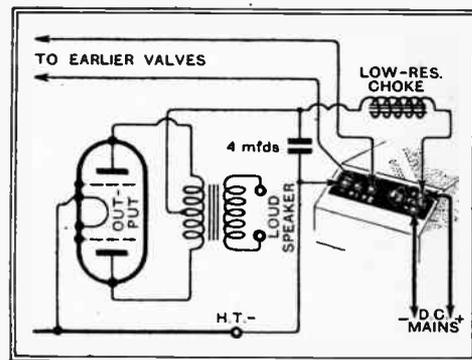


Fig. 2.—A parallel low resistance smoothing circuit for feeding a Class "B" or Q.P.P. stage. The extra choke is joined directly to the positive side of the mains.

By feeding the output stage through a "parallel" smoothing circuit external to the eliminator, as shown in Fig. 2, undesirable voltage changes are avoided. An inductance of 10 henrys, or even less, is almost always more than sufficient for the extra choke; its D.C. resistance should not amount to more than 100 or 200 ohms.

# Columbia "Radiograph"

MODEL 1003



## An Economical but Powerful Battery Radio-gramophone

THE possession of a full-sized cabinet radio-gramophone is the aspiration of every wireless and gramophone enthusiast. It provides the widest possible scope in entertainment value and sets the standard for volume and quality of reproduction under domestic conditions. Until recently the possession of such an instrument inferred the availability of a mains supply, and it is due to the fact that radiograms are generally of the mains-operated type that their reputation for quality performance stands so high.

A year ago, to have produced a battery-operated model with a sound output anything like comparable with its size would have been commercial suicide, for few could have afforded the cost of H.T. battery replacements. As it is, those who are not yet familiar with the possibilities of the latest battery output valves must have grave misgivings on this score when the Columbia Model 1003 is demonstrated to them for the first time. The undistorted power output is rated at 1,250 milliwatts, and owing to the efficiency of the large permanent-magnet moving-coil loud speaker installed, the sound output is, if anything, more than one would expect from this rating. Yet the measured standing H.T. consumption in the

**FEATURES. Type.**—Battery radio-gramophone with moving-coil loud speaker and double-spring motor. **Circuit.**—Variable- $\mu$  screen-grid H.F. stage with band-pass input—grid detector with reaction—quiescent push-pull pentode output valves. **Controls.**—(1) Tuning and on-off switch. (2) Waverange and gramo. switch. (3) Radio volume control. (4) Gramo. volume control. **Price.**—£21. **Makers.**—Columbia Gramophone Co., Ltd., 98-108, Clerkenwell Road, London, E.C.1.

set tested was only 6.5 mA. In no instance did the peaks in loud passages exceed 16 mA. and at full volume the average consumption was between 8 and 10 mA. Under normal listening conditions the average would be even less.

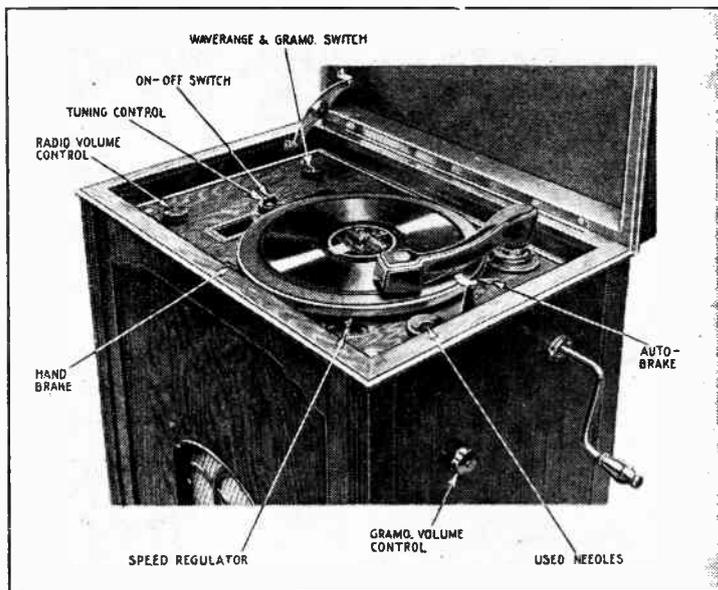
The reproduction of gramophone records is particularly good. The new Columbia No. 22 pick-up is employed and a separate volume control on the outside of the cabinet enables the lid to be kept closed during the playing of a record, with a consequent reduction in surface noise. It is worthy of note that the amplification available has been very happily matched to the pick-up output, and on the average record full volume without overloading is obtained with the control at maximum.

An important item of the specification is the silent and powerful double-spring motor. In addition to the usual friction brake and speed regulator, it is fitted with an automatic stop actuated by the tone arm.

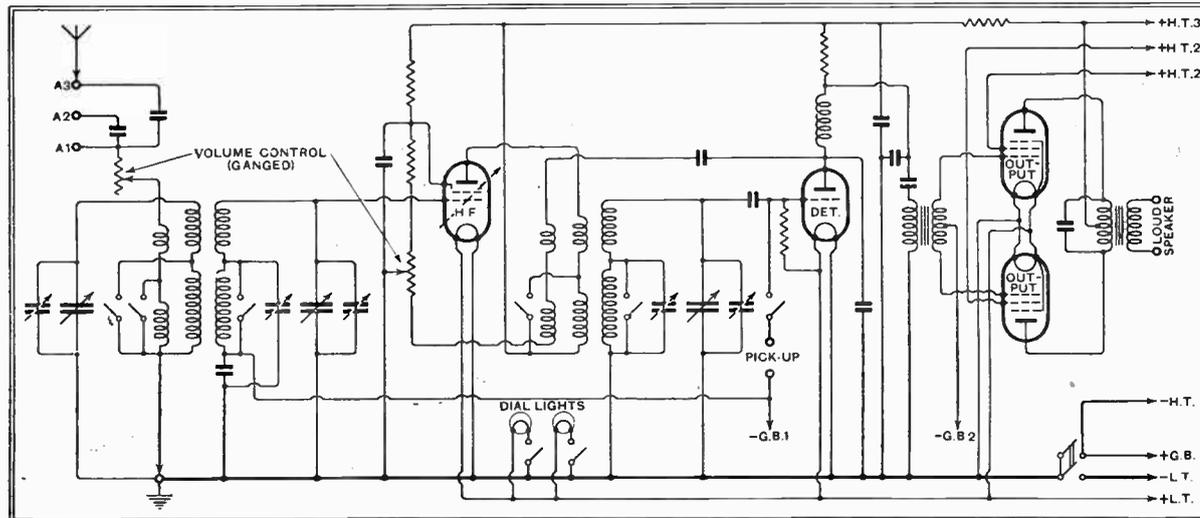
The particular system of push-pull which has been adopted in the output stage is known as "CQA" (constant

quality amplification), and is so called because distortion is kept within the 5 per cent. limit over the full volume range of the instrument. Pentode valves are employed and accurate matching is achieved by inserting the auxiliary grid connections to the H.T. battery in sockets lettered to correspond with the markings on the valves, which are tested and classified in the factory.

The earlier stages on the radio side consist of a variable- $\mu$  screen grid amplifier and a grid detector. There are three tuned circuits and reaction is applied to the H.F. coupling transformer through a section of the radio volume control potentiometer. Selectivity is good for a receiver with a



General view of motor board. Note the external gramo. volume control.



Circuit diagram of radio chassis. The output valves are matched by adjusting the auxiliary grid voltages.

single H.F. stage, and in Central London stations separated by more than 40 kc/s from the local stations can be received without interference. The range on both wavebands is sufficient to receive all the worthwhile European programmes after dark, and many of the more powerful long-wave and medium-wave stations in daylight.

This is an instrument which can be recommended without reserve to those who are not fortunate in having supply mains available, but who require the widest possible entertainment value with the minimum upkeep cost.

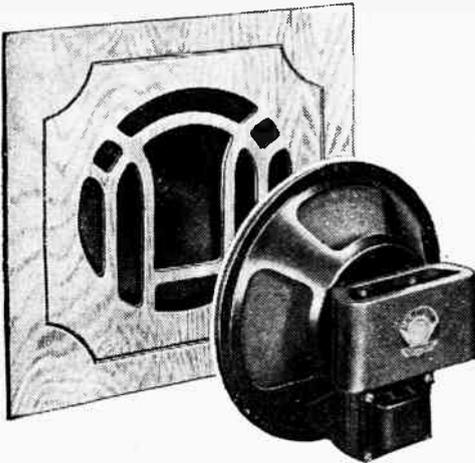
**NEXT WEEK'S SET REVIEW:**  
**TELSEN "464"**

# NEW APPARATUS REVIEWED

## Latest Products of the Manufacturers

### GRAMPIAN LOUD SPEAKERS

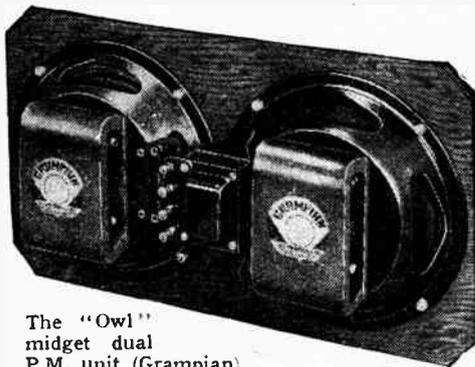
**T**HE type P.C.X. is a permanent magnet unit with a very pleasing balance of tone. Its sensitivity is good, and the useful frequency range is from 75 to 4,500 cycles. The bass resonance occurs at 90 cycles, but is not sharply defined, with the



Grampian P.C.X. loud speaker and fret baffle.

result that the low-note response is full without any definite coloration. In the upper register also there are no obvious resonances to cause shrillness, but the output between 2,000 and 4,000 cycles is higher than the general level. The unit is fitted with a multi-ratio transformer suitable also for push-pull output stages, and a subsidiary plug and socket enables the unit to be used with a low-impedance extension loud speaker. The price, which includes an ornamental baffle, is 45s.

The "Owl" midget dual P.M. unit is supplied on a baffle measuring 13½ in. x 7½ in., and can be fitted into a number of standard receiver cabinets. The diaphragms are both 4½ in. in diameter, but are made of different materials in order that the frequency range may be as wide as possible. The sensitivity is slightly less than that of the P.C.X., but the reproduction has the distinctive quality associated with dual source repro-



The "Owl" midget dual P.M. unit (Grampian).

ducers. In view of the small size of the diaphragm, there is a surprisingly good response below 100 cycles, and at 50 cycles the note contains very little second harmonic. There are fairly well defined resonances at 140, 2,500, and 4,500 cycles, and the response is good up to 5,500 cycles. The price is 55s., complete with multi-range output transformer, and the makers are Grampian

Reproducers, Ltd., Station Avenue, Kew Gardens, Surrey.

### PILOT CLASS "B" CONVERSION KIT

**W**HILE the conversion of a battery set to Class "B" operation is a comparatively straightforward matter, for it entails but little alteration in the existing layout, there are many who hesitate to embark on this work in view of some uncertainty as to the choice of components and the exact manner to deal with their own particular receiver. In order to simplify this conversion the Peto Scott Co., Ltd., 77, City Road, London, E.C.1, have introduced the Pilot Class "B" Conversion Kit which is complete in every detail and includes a blue print of the wiring, also instructions for converting receivers of various types.

The kit consists of a driver transformer, seven-pin valve-holder, tapped output choke, screws, the necessary wire and a Cossor 240 B Class "B" output valve and, as mentioned already, a blue print and full instructions.

In most cases it will be found possible to accommodate the few additional components in the set, and the Class "B"

Peto Scott Pilot Class "B" Conversion Kit.



valve-holder filament connections can be wired in parallel with the L.T. wiring so that the existing battery switch operates on all valves. Where this course is not possible the parts can be assembled as a small separate unit and used external to the set. They can be accommodated on a baseboard measuring 9 in. x 4 in., and the price including valve is 37s. 6d.

### NEW KINVA SCREENED H.F. CHOKE

**T**HE latest addition to the range of Kinva screened H.F. chokes made by Postlethwaite Bros., Church Hill, Kinver, near Stourbridge, is the model I.D.C., in which is used an iron dust alloy core described as Kinvalloy. It is a general-purpose model of high inductance and low self-capacity.

The low self-capacity, which is of the order of 3 m-mfds. only, results from the use of a high-permeability core, as this enables an inductance of approximately 200,000 microhenrys to be obtained with fewer turns. The winding is well sectionalised.

During the course of our tests the only resonance of any consequence that could be

traced fell within the "no man's land" of broadcasting, being at a wavelength of 575 metres. A subsidiary resonance falling about the middle of the medium waveband was just discernible, but it has negligible effect on the tuning



Kinva iron-cored screened H.F. choke model I.D.C.

or on the efficiency of the reaction circuit. Whether used in H.F. or detector circuits the choke will be entirely satisfactory, and at the price of 4s. 6d. it represents good value.

### LOUD SPEAKER BAFFLES

**T**HE latest directional baffles made by Scientific Supply Stores (Wireless), Ltd., 126, Newington Causeway, London, S.E.1, are designed to work in conjunction with ordinary cone diaphragm moving-coil units, and are made of waterproofed non-resonant material. The circular flange at the throat is of wood, so that the loud speaker can be readily fixed by wood screws.

There can be no doubt that a horn of this type, by virtue of its directional properties, greatly improves the efficiency of a moving-coil unit, and for public address work can be usefully employed to reduce microphone pick-up.

The unit illustrated has a 7½ in. throat and 36 in. diameter flare, and the length is 33 in., and is sold at 29s. 6d. There is a wide range of alternative sizes, and the makers are prepared to undertake the construction of horns with rates of taper other than the exponential, which is standard.



Scientific Supply Stores' exponential baffle for moving-coil units.

# READERS' PROBLEMS

## D.C. and Battery "Monodials"

A NUMBER of readers, who have either a D.C. mains supply or are forced to depend on batteries for operation of their receivers, have asked whether suitably modified versions of the New Monodial could be described for their benefit.

It is regretted that at the present moment this is hardly practicable, for the reason that the special frequency-changing valve used in the new receiver is as yet only available in a form suitable for A.C. operation.

## An Ideal Country-house Set

SEVERAL prospective constructors of the D.C. Superhet. (September 29th) have enquired whether it would be possible to operate this receiver from a low-voltage house-lighting plant. It is understood, of course, that the supply voltage would be supplemented, so far as H.T. is concerned, by an accumulator battery.

valve, in series with a "dropping" resistance, is connected in parallel with the other valves.

No smoothing should be necessary with a domestic supply derived from accumulators. Of course, the resistance value shown will need modification with mains supply of high voltage, and, further, a resistance will be required in series with the  $\frac{1}{4}$ -amp. valves for pressures above 50 volts.

## A Matter of Choice

WE are asked to say whether it is desirable to fit a fixed or semi-fixed potentiometer for supplying the screening grid voltage of the H.F. valve in a battery-operated receiver. Our correspondent has in mind the use of an arrangement similar to that customarily employed in mains-operated sets.

Practically the only advantage of a potentiometer feed for the screening grid is that the need for a multiplicity of tappings

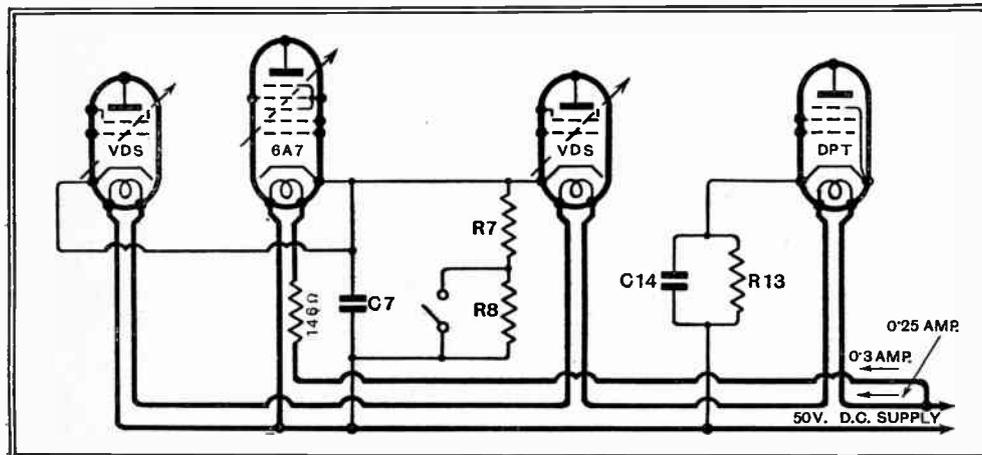


Fig. 1.—Rearrangement of the D.C. Superhet heating circuits for a 50-volt D.C. supply.

With regard to the supply of the filament circuit from a low-voltage source—say, 50 volts, for example—no difficulty should be encountered, and it is suggested that the wiring should be carried out in the manner shown in Fig. 1. The heaters are in series-parallel; the three 16-volt  $\frac{1}{4}$ -amp. valves are in series, and, as the total voltage dissipated across them amounts practically to that of the mains, no series resistance will be required. The 6A7 detector-oscillator

## The Wireless World INFORMATION BUREAU

THE service is intended primarily for readers meeting with difficulties in the construction, adjustment, operation, or maintenance of wireless receivers described in *The Wireless World*, or those of commercial design which from time to time are reviewed in the pages of *The Wireless World*. Every endeavour will be made to deal with queries on all wireless matters, provided that they are of such a nature that they can be dealt with satisfactorily in a letter.

Communications should be addressed to *The Wireless World* Information Bureau, Dorset House, Stamford Street, London, S.E.1, and must be accompanied by a remittance of 5s. to cover the cost of the service. The enquirer's name and address should be written in block letters at the top of all communications.

on the H.T. battery is avoided. With this potentiometer, and with suitable feed resistance for the anode circuits of all valves requiring less than the maximum voltage, only two connections to the battery would be needed.

On the other side of the picture we have the disadvantages that the potentiometer will consume an appreciable amount of current while the set is working, and that switching must be complicated by the provision for means to prevent the flow of current when it is out of use. Further, in order to ensure good regulation, especially when a variable- $\mu$  valve is used, it would be necessary to arrange the potentiometer value so that the total current consumed by it reaches an appreciable value.

## Transformers for Q.P.P.

A QUERIST, who has an ordinary push-pull L.F. transformer—several years old, but of good make—asks whether it would be possible to use this component in a Q.P.P. amplifier.

In theory there is no basic difference between a push-pull and a Q.P.P. transformer, but in practice the latter almost always has a much higher step-up ratio. We expect that our correspondent's transformer has a

THESE columns are reserved for the publication of matter of general interest arising out of problems submitted by our readers. Readers requiring an individual reply to their technical questions by post are referred to "The Wireless World" Information Bureau, of which brief particulars, with the fee charged, are to be found at the foot of this page.

ratio of about 3:1, and, if so, it would be quite unsuitable in a receiver where the detector feeds directly into the output stage. This is because the maximum voltage output from a conventional detector is quite insufficient to "load up" such a stage unless it is stepped up to a considerable extent.

This handicap is, however, easily overcome by fitting an intermediate L.F. stage between the detector and output valves; if it is desired to use the existing transformer we recommend this plan, which, indeed, has much in its favour.

## Anode Current Fluctuations

A READER, who always uses a milliammeter in the anode circuit of his detector valve as a tuning indicator, writes to us regarding the changes in current that he has observed. With his present receiver the meter shows a reduction of current of nearly 1 milliamp. when the set is tuned to a moderately powerful transmission, whereas with an earlier set a change of as much as a  $\frac{1}{4}$ -milliamp. could hardly be obtained as a result of tuning-in even the local station.

The question of anode current changes under the influence of incoming signals is bound up with the subject of detector design. Modern detectors are designed to give a comparatively large undistorted output; indeed, it is in most cases essential that they should do so, as they must operate the output valve without the help of an intermediate L.F. stage. Consequently, a large change in anode current is to be expected. In the older set referred to an intermediate stage was probably included, and so the maximum output required from the detector was presumably much less.

A detector anode current change approaching 1 milliamp. is by no means excessive nowadays, and does not indicate that the valve is being overloaded.

## BOOKS RECEIVED

**A Guide to Amateur Radio.**—A series of simple articles intended to provide an introduction to amateur radio work, and outlining the advantages to be gained through membership of the R.S.G.B. The subjects include an explanation of the elementary principles of transmission and reception, the construction of a short-wave transmitter and receiver, aerial systems, power supply, frequency measurement, etc. Pp. 48, with numerous illustrations and diagrams. Published by the Incorporated Radio Society of Great Britain, 53, Victoria Street, London, S.W.1 Price 6d.

**La Télévision et ses Progrès**, by P. Hemardinquer.—A short account of the history and progress of television, the general principles, and a description of typical apparatus, with a chapter forecasting the future progress in France, Belgium, Germany, England, and the United States. Pp. 243+xiv, with 150 illustrations and diagrams. Published by Dunod, 92, rue Bonaparte, Paris, VI. Price fcs. 29.

**Bombay Radio News.**—We have received from the publishers, The Bombay Radio Press, the first two numbers of this journal, whose avowed object is the popularising of wireless in India. In addition to paragraphs of local interest, it contains articles intended to interest listeners in the technical side of reception. The price of this monthly publication is 2 annas, or one rupee per annum.

# COLUMBIA'S AMAZING RADIOGRAM OFFER!

A FOUR-VALVE ALL-ELECTRIC RADIO - GRAMOPHONE WITH MOVING COIL SPEAKER AT

**23** GNS.  
*or by hire purchase*

### Special Features

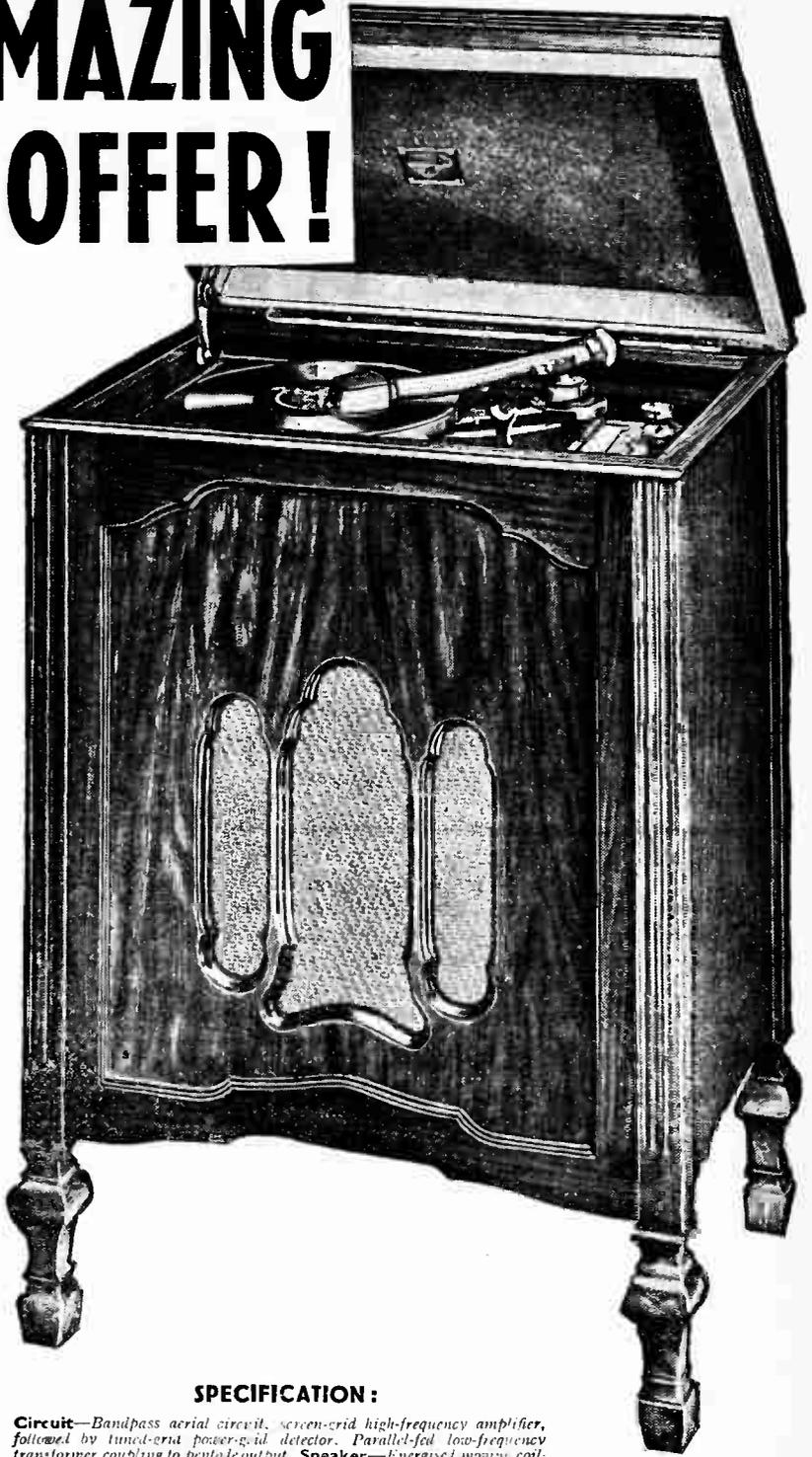
1. Band - pass circuit.
2. Flood-lit scale calibrated in wavelengths with station-finder.
3. Energised moving - coil speaker.
4. Provision for additional speaker.
5. Universal automatic brake.
6. Volume control common to both radio and gramophone.
7. Induction motor (A.C. model).
8. One knob tuning with reduction gear.
9. Three aerial tappings.
10. Mains aerial device.
11. Low running costs.



THE FINEST VALUE EVER

PRODUCED BY THE GREAT COLUMBIA FACTORY

Here is the chance of a lifetime to buy a luxury radio-gramophone at an amazingly low figure. For 23 GNS. you are offered an instrument that embraces every material advancement of radio and gramophone science—combined in an instrument which needs but plugging into your electric light supply to bring you the finest programmes that modern broadcasting has to offer, and superb rendering of gramophone music—both with a startling fidelity of tone. Columbia have never had more confidence in an instrument than they have in this—representing as it does the greatest value for money to-day—an instrument that might reasonably be priced at many pounds more. This radio-gramophone is a standard product of the great Columbia factory—the largest in Europe—and like all Columbia instruments has undergone nearly eleven hundred tests as part of the routine of manufacture—which explains Columbia's confidence in this product. Read the brief specification given—then take the first opportunity of seeing and hearing it at any Columbia dealer's. Remember, this is a chance not to be missed!



### SPECIFICATION :

**Circuit**—Bandpass aerial circuit, screen-grid high-frequency amplifier, followed by tuned-grid power-grid detector. Parallel-fed low-frequency transformer coupling to pentode output. **Speaker**—Energised moving coil. Provision for additional speaker of high or low resistance. **Controls**—Gramophone LW, MW, 'Off'. Switch, single knob tuning for three-gang condenser. Volume control which also operates on pick-up. **Motor**—Induction type. **Cabinet**—Walnut. **Valves**—MS4B, MH4, MPT4, U12. **Output**—1½ watts. **Current Consumption**—65 watts on radio, 95 watts on gramophone. **Wavelengths Range**—200-550 maximum-wave metres; 1,000-2,000 long-wave metres. **Voltage Range**—200/250 volts, 50/60 cycles. **Size**—34 ins. high, 23½ ins. wide, 16½ ins. deep. **Price**—23 guineas. **Hire-Purchase Terms**—Deposit £2.8.6, and 12 monthly payments of £1.19.0.

# Columbia

RADIO AND RADIO-GRAMPHONES

COUPON: To the Columbia Gramophone Co., Ltd.,  
98 Clerkenwell Road, E.C.1

Please send me particulars of the all-electric Radiograph Four Model 620 without obligation.

NAME .....

ADDRESS .....

W.W.20.10.33.

# MISCELLANEOUS ADVERTISEMENTS

## NOTICES.

**THE CHARGE FOR ADVERTISEMENTS** in these columns is

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**ADVERTISEMENTS** for these columns are accepted up to **FIRST POST ON MONDAY MORNING** (previous to date of issue) at the Head Offices of "The Wireless World," Dorset House, Stamford Street, London, S.E.1, or on **SATURDAY MORNING** at the Branch Offices, 19, Hertford Street, Coventry; Guildhall Buildings, Navigation Street, Birmingham, 2; 290, Deansgate, Manchester, 3; 28a, Renfield Street, Glasgow, C.2.

Advertisements that arrive too late for a particular issue will automatically be inserted in the following issue unless accompanied by instructions to the contrary. All advertisements in this section must be strictly prepaid.

The proprietors retain the right to refuse or withdraw advertisements at their discretion.

Postal Orders and Cheques sent in payment for advertisements should be made payable to **ILIFFE & SONS Ltd.**, and crossed **& Co.** Notes being untraceable if lost in transit should not be sent as remittances.

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The proprietors are not responsible for clerical or printers' errors, although every care is taken to avoid mistakes.

## RECEIVERS FOR SALE.

**M.R.D. Co.** Offer the Following Unique Guaranteed Surplus; carriage paid or call.

**RECEIVER** Chassis, complete with all components, ready for wiring: 2-valve, A.C., £2; 2-valve, D.C., £2; 3-valve, A.C., S.G., Det., Pen., 2-gang tuning, £3/5; 3-valve P.C. ditto, £3/5.—The Mains Radio Development Co., 4-6, Muswell Hill Rd., London, N.6. [3775]

**GECOPHONE "Carnival"** Radiogram, 1933, almost new, D.C. model; £8.—Box 8394, c/o *The Wireless World*. [3753]

**COLUMBIA** Model 310 Radiogram; list 40 guineas, offered at £15, as new; carriage paid.—Rogers, Radio, Lowestoft. [3707]

**COLUMBIA** Suitcase Portable Model 306, offered minus valves and batteries at £3 each.—Rogers, Radio, Lowestoft. [3723]

**FERRANTI A.C. Band-Pass Three**, with valves, less cabinet; list £14, £8 or offer.—G. Hutson, Wide Bargate, Boston. [3718]

**"W.W."** Monodial Super, with A.V.C., may be heard by appointment; £15, with valves.—7, Gravelly Hill North, Birmingham. [3724]

**FERRANTI 1933 7-valve Superheterodyne**, perfect working order; bargain; heard evenings.—Horn, 29, Craigmillar Rd., Glasgow. [3748]

**PHILIPS 1933 5-valve All-mains 110-250 A.C. Receiver**; cost £24/3, sell £14; demonstration.—5, West Side, Phone: Wimbledon 3470. [3672]

**REMEMBER** Macindoe and Co., 99, Waterloo Street, Glasgow, for "W.W." kits and new season's receivers; part exchange, cash or H.P. [3734]

**2-VALVE** Regentone A.C., late 1932; £6/19/6, sell 45/-, or exchange good moving coil speaker.—Box 8392, c/o *The Wireless World*. [3751]

**LISSEN "Skyscraper"** latest 4-valve, all-wave model, complete with valves, positively as new; £4.—Aldridge, 29, Chatterton Rd., London, N.4. [3737]

**EDDYSTONE** All-wave Four, second-hand, perfect order, list price £27, complete, £7; new Console model Ultra Panther, list 22 guineas, one only, 12 guineas.—Raymart, 19, John Bright St., Birmingham. [3755]

**QUALITY!!!**—Specialists for quality apparatus; Monodials and D.C. sets a speciality; any set, large or small, built, supplied, or repaired; contractors to clubs and hospitals.—R. A. Arnell, White House, Rosehill Park West, Sutton, Surrey. Phone: 4591. [3713]

**ARMSTRONG 1934 Universal A.C.-D.C. 4v. Chassis**, incorporating 3 tuned circuits, 9 kilocycles separation, giving practically superheterodyne performance, full vision scale, one knob tuning, combined one knob switching, 1 1/2 watts output, 75/-, with valves, 114/-; Armstrong latest 4v. A.C. chassis, 3 tuned circuits, 9 kilocycles, square peak, single knob tuning, high frequency pentode, power grid detection, multi grid 2 1/2 watts output, ideal for making radiogram, 79/-, with valves, 118/-; both models fully guaranteed; approval willingly.—Armstrong, Co., 100, King's Rd., N.W.1. [3735]

## MAINS EQUIPMENT

**A.C. CHARGERS** Supply the Latest Models in Battery Charging Plants.

**A.C. Will Send Trade Literature**, with prices of models with 4 circuits, H.T. and L.T., 0-2, 0-1, 0-1 1/2, 0-3 amp., 30 volts on each, will charge 120 volts H.T. and 50-100 I.T. batteries at once for 1/-; price £9/15.—A.C. Chargers, 22, Hall St., Willenhall, Staffs. [3770]

## NUMBERED ADDRESSES.

For the convenience of private advertisers, letters may be addressed to numbers at "The Wireless World" Office. When this is desired, the sum of 6d. to defray the cost of registration and to cover postage on replies must be added to the advertisement charge, which must include the words Box ooo, c/o "The Wireless World." All replies should be addressed to the Box number shown in the advertisement, c/o "The Wireless World," Dorset House, Stamford Street, London, S.E.1. Readers who reply to Box No. advertisements are warned against sending remittance through the post except in registered envelopes; in all such cases the use of the Deposit System is recommended, and the envelope should be clearly marked "Deposit Department."

## DEPOSIT SYSTEM.

Readers who hesitate to send money to advertisers in these columns may deal in perfect safety by availing themselves of our Deposit System. If the money be deposited with "The Wireless World," both parties are advised of its receipt.

The time allowed for decision is three days, counting from receipt of goods, after which period, if buyer decides not to retain goods, they must be returned to sender. If a sale is effected, buyer instructs us to remit amount to seller, but if not, seller instructs us to return amount to depositor. Carriage is paid by the buyer, but in the event of no sale, and subject to there being no different arrangement between buyer and seller, each pays carriage one way. The seller takes the risk of loss or damage in transit, for which we take no responsibility. For all transactions up to £10, a deposit fee of 1/- is charged; on transactions over £10 and under £50, the fee is 2/6; over £50, 5/-. All deposit matters are dealt with at Dorset House, Stamford Street, London, S.E.1. and cheques and money orders should be made payable to Iliffe & Sons Limited.

**SPECIAL NOTE.**—Readers who reply to advertisements and receive no answer to their enquiries are requested to regard the silence as an indication that the goods advertised have already been disposed of. Advertisers often receive so many enquiries that it is quite impossible to reply to each one by post. When sending remittances direct to an advertiser, stamp for return should also be included for use in the event of the application proving unsuccessful.

## Mains Equipment.—Contd.

**VORTEXION** Lead Again.

**VORTEXION A.C./34**, used by author in construction of a V.C. Three; see also displayed advertisement, page 4.

**VORTEXION**, Wimbledon, for 99.9% reliable transformers.

**IF** You Haven't Tried Them Yet Ask Someone who has, or call and inspect complimentary letters.

**GUARANTEED** 12 Months, and within 5% normal and 2 1/2% super models, neat shrouding, with detachable feet, as used by Government Departments, etc., etc.

**VORTEXION**—New monodial transformer, 200-250, 50 cycles, 425-0-425, 120 m.a., 4v. C.T. 3a., 4v. C.T. 1a., 4v. C.T. 1a., 4v. C.T. 6a., screen primary, open type, 20/-; shrouded, 22/-; super shrouded, 26/-; weight 14 lb., carriage 2/- extra; 10 henry choke, 5/6, post 9d.; 20 henry, 8/6.

**VORTEXION**—5-watt Monodial A.V.C. model, 400-0-400, 120 m.a., 4v. 6a., 4v. 3 1/2a., 4v. 2, 4v. 1a., super screened, 20/-, shrouded 24/-.

**ALL** Secondaries Centre Tapped.

**VORTEXION**—250-0-250 60 m.a., 4v. 1 to 2a., 4v. 2 to 4a.; open type 10/6, shrouded 12/6; post 9d.

**VORTEXION** D.C.4 Choke, specified for D.C. superhet; 8/6.

**VORTEXION** Transformers, tested with 2,000 volts between windings.

**VORTEXION**—Ferrocart III, 350-0-350, 60 m.a., 4v. 2.5, C.T. 4v. 3.5, C.T.; open type 15/6, shrouded 16/-, post 9d.

**VORTEXION**—Super model for I.I.T. 8 or 9 or 10, 4v. 1 to 2, 4v. 2 to 4; open type 14/6, shrouded 16/6, post 1/-.

**VORTEXION**—350-0-350, 120 m.a., 4v. 2 to 5a., 4v. 2 to 4a., 4v. 2.5a.; open type 14/6, shrouded 16/6.

**VORTEXION**—400 or 450 or 500v., 120 m.a., 4v. 2 to 5, 4v. 2 to 5, 4v. 2 to 5; open type 19/-, shrouded 23/-.

**VORTEXION**—400 or 450 or 500, 150 m.a., 4v. 4a., 4v. 2.5, 4v. 2, 4v. 2, 4v. 2, core size 2 1/2 in. x 1 1/4 in., a superb job, 2% regulation, 35/-; shrouded with terminals less terminals, 30/-, open type 26/-; post 1/3.

**VORTEXION** Auto Transformers to B.E.S.A. Specification '00, 110, or 120v. to 200, 220 or 240 volts, 60 watts, 9/-, post 9d.; 120 watts, shrouded 12/6, open type 10/6, post 1/-; 200 watts, open 14/6, shrouded 16/6, post 1/-; 500 watts 30/-, 2,000 watts £4/10.

**VORTEXION** 600-watt Transformers; £4/10, carriage free.

**VORTEXION** 30h. at 60 m.a. Chokes, 5/6; 40h. at 60 m.a., 8/6; 30h. at 150 m.a., 200 ohms, 10/6 open type, 12/6 shrouded.

**VORTEXION** Transformers Made to Your Specification price according to wattage, 6v. filaments same price unless wattage grossly exceeded; special quotations by return.

**VORTEXION** (S. A. BROWN), 182, The Broadway Wimbledon, S.W.19. Tel.: Liberty 2814. [3743]

**TANTALUM** for A.C. Chargers, H.T. and L.T.—Blackwell's Metallurgical Works, Ltd., Garston, Liverpool [3744]



AS FOUNDERS OF CONSTRUCTORS' SETS IN 1919, we have established a world-wide reputation for the supply of Complete Kits and Part Kits for all "Wireless World" Set designs. An essential feature of this Expert Service to the Home Constructor is IMMEDIATE DELIVERY FROM STOCK—CASH or C.O.D.—of any exclusively specified or difficult to obtain components. Rely on PETO-SCOTT, he always gives fullest satisfaction to every customer.

## A.V.C. THREE

**Kit 'A'**—Author's Kit of First Specified Parts, including Peto-Scott Plymax Chassis and Ply Panel, assembled and drilled, less valves and cabinet. **Cash or C.O.D. Carriage Paid. £10-15**

or 12 monthly payments of 19/9.

**COMPLETE KIT** As Kit 'A' but with Specified Valves. **Cash or C.O.D. Carriage Paid £14-1-6**

or £2-1-6 Deposit and 11 monthly payments of 24/-.

THESE ARE THE PARTS THE AUTHOR USED:

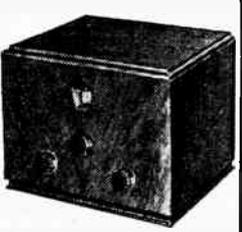
1 J.B. Nugent No. 2064 3-gang Variable Condenser and Disc Drive	2 5 0
1 ORMOND R307 Variable Condenser 0.0005 mfd	1 2 0
1 ORMOND R355 Knob for above	0 6
3 WEARITE "Nucleon" Coils, B.P.1, B.P.2, T.G.	1 17 6
1 MULTITONE "Toco" Transformer 1:4	17 6
1 MULTITONE Tone Control Potentiometer for above	3 6
1 WATTEL T4 Val. Gapped Control, 250,000 ohms	3 0
1 WEARITE HFP H.F. Choke	3 6
1 WEARITE HPPA H.F. Choke	4 0
1 DAVENET No. 101 Power Smoothing Choke	16 0
1 VORTEXION Type AC34 Mains Transformer	18 0
4 CLIP (chassis mtg. air spring type 5-pin valveholders)	5 0
2 CLIP Floating type 7-pin valveholders	2 0
2 TELSEN W.2070.0001 mfd. fxd. cond.	2 0
1 TELSEN W.2110.0005 mfd. fxd. cond.	4 4
1 TELSEN W.2290.25 mfd. 500 v. D.C. test cond.	1 6
1 TELSEN W.3160.05 mfd. fxd. cond.	4 6
1 TELSEN W.227 1 mfd. 500 v. D.C. test cond.	1 9
2 TELSEN W.225 2 mfd. 500 v. D.C. test cond.	5 0
5 TELSEN W.411 0.1 mfd. 1,500 v. D.C. tubular cond.	7 3
1 TELSEN W.408 0.005 mfd. 1,500 v. D.C. tubular cond.	1 0
1 TELSEN W.396 dry elec. cond. 4 mfd. 500 working	4 6
1 TELSEN W.398 8 mfd. dry elec. cond. 500 working	5 6
1 TELSEN W.399 25 mfd. dry elec. cond. 25 volts	2 6
11 GRAHAM FARISH "Ohmite" resistances, as specified	16 0
1 GRAHAM FARISH Standard grid leak 2 megohm	9 9
1 GRAHAM FARISH Standard grid leak 0.5 megohm	9 9
2 CLAUDE LYONS 729 on-off switches	3 0
1 CLAUDE LYONS 729 single pole double throw switch	1 9
1 WELBY-LEE Type B terminals, A.E., Pick-up (2)	2 0
1 PETO-SCOTT Panel (1st. ply. 15 x 8 in.)	2 6
1 PETO-SCOTT Plymax Baseboard, 12 x 15 x 2 1/2 in.	11 6
1 B.E.G. 5-pin plug	1 9
2 ozs. No. 20 tinned copper wire; 6 lengths Systoflex; 1 length screened sleeving; wire, Paolino, flex, etc.; screws; 19 tin. No. 4 R/hd., 36 tin. No. 4 R/hd., 18 tin. No. 4c/sk., 1 6BA tin. R/hd. with nut and washers	7 0
<b>KIT "A" CASH OR C.O.D. £10 15 0</b>	

**ALWAYS BUILD ON PLYMAX PETO-SCOTT PLYMAX CHASSIS AND PLY PANEL SOLELY SPECIFIED.** Plymax Chassis as specified by the Author, drilled and assembled, 15" x 12" x 2 1/2". **14/-** Cash or C.O.D. Post and Packing 1/3 extra.

**FINISHED INSTRUMENT A.V.C. THREE**—Ready Assembled exact to Author's Specification with Valves and Cabinet. **£17-17-0** Aerial Tested. Cash or C.O.D. Carriage Paid or £2-17-0 Deposit and 11 monthly payments of 30/-

## RECOMMENDED

**PETO-SCOTT WALNUT A.V.C. THREE CABINET**



A Handsome figured Walnut Cabinet specially recommended for the A.V.C. Three. Constructed throughout with well-seasoned timber by London's leading piano craftsmen. Front ready drilled for panel controls. Cash or C.O.D. Carriage Paid. Size 15" x 12" x 8" **25/-**

SEND FOR 1934 CABINET CATALOGUE

**IMMEDIATE DELIVERY CASH - C.O.D. - H.P.**

**FOREIGN ORDERS.** Send one-third value of goods with order. Balance (including forwarding charges) payable to our forwarding agents on delivery. Insurance effected if desired. All orders carefully executed and expertly packed by special export staff.

**PETO-SCOTT CO. LTD.** 77, CITY ROAD, LONDON, E.C.1. West End Showrooms: 62, High Holborn, London, W.C.1

**Mains Equipment.—Contd.**

**N.P.** for Battery Chargers; genuinely the lowest prices in the trade.  
**N.P.** Send Trade Lists and New Range of Photographs of Latest Plants.  
**N.P.** Have One or Two Slightly Soiled Instruments at Bargain Prices.—H.T. 200v. 125 m.a., and L.T. 15v. 2 amps. metal rectifiers, usual £12, bargain £7, photographs; 3 circuits, 75v. 6 amps., usual £13/15, bargain 8s new, £12/5; will do up to 300 batteries at once. Others on list.  
**N.P.** Make H.T. and L.T. Chargers for Battery Stations from 62/6 to £17/10, suitable for dealing with hundreds of batteries at one time; trade list and photographs.  
**N.P.** Advice on All Matters of Battery Charging, diagrams supplied for complete wiring of cells, plant only needs plugging in and switching on; state your needs—the season has commenced now.—Nash Products, Ltd., Stetchford, Birmingham. [3759]

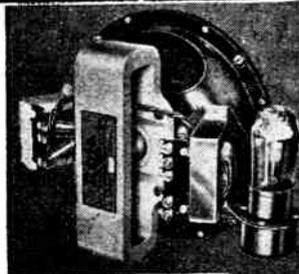
**PARTRIDGE** Transformers.—Self praise is no recommendation, but praise from experts is significant.  
**PARTRIDGE** Transformers—"a sound electrical job... very good value," *Wireless World*, Sept. 15th.  
**PARTRIDGE** Transformers—"voltage regulation excellent... transformer remained remarkably cool," *Radio Trade Review*, May, 1933.  
**PARTRIDGE** Transformers—"found to be excellent... designed on sound lines," *Wireless Magazine*, October, 1932.  
**PARTRIDGE**—250-0-250v., 60 m.a., 4v. 1a., 4v. 2-4a., 11/7; 250-0-250v., 60 m.a., 4v. 1a., 4v. 2-3a., 4v. 1a., 12/-.  
**PARTRIDGE**—350-0-350v., 60 m.a., 4v. 2-2½a., 4v. 2-4a., 13/6; 350-0-350v., 120 m.a., 4v. 2-2½a., 4v. 3-5a., 4v. 1a., 17/3.  
**PARTRIDGE**—425-0-425v., 120 m.a., 4v. 2-2½a., 4v. 3-5a., 4v. 2a., 20/6; 500-0-500v., 100 m.a., 4v. 2-2½a., 4v. 3-5a., 4v. 2a., 21/-.  
**PARTRIDGE**—500-0-500v., 120 m.a., 4v. 2-4a., 4v. 3-6a., 4v. 1-2a., 4v. 1-2a., 27/6; larger types to order.  
**PARTRIDGE**—0-7½-9-11v., 1.2a. 9/3; 0-15-18-22v., 1.2a., 10/-; any other model to order.  
**PARTRIDGE**—135v. (tapped 110v.), 90 m.a., 4v. 2-4a., 10/6; 240v. (tapped 200v.), 200 m.a., 4v. 2-4a., 13/3.  
**PARTRIDGE**—Step-up or step-down auto transformers, 60w., 10/3; 100w., 12/9; others to order.  
**PARTRIDGE** Chokes.—61l., 500 m.a., 45 ohms, 18/6; 13H., 200 m.a., 120 ohms, 11/6; 20H., 120 m.a., 320 ohms, 9/3.  
**PARTRIDGE** Chokes.—30H., 60m.a., 550 ohms, 7/9; 40H., 40 m.a., 700 ohms, 6/6; all constant inductance.  
**"WIRELESS WORLD"** A.V.C.3 Transformer, 13/6; choke, 7/9; new Monodial transformer (competitive model), 24/-.  
**LARGE** Power (5w. to 100w. speech) Output Transformers, for relay and P.A. work, frequency distortion within 1 db. from 50 to 8,000 cycles.  
**PARTRIDGE** Transformers.—Trade enquiries invited.  
**PARTRIDGE, N., B.Sc.(Eng.), A.M.I.E.E., A.I.Rad.E.**  
**PARTRIDGE, N., King's Buildings, Dean Stanley St., London, S.W.1. Tel.: Victoria 5035. [3660]**

**TRANSFORMER** Materials, stampings, wire, etc., cheap; list free.—Wales, 14, Monmouth Av., Bury. [3741]  
**HOYNE'S** Transformers and Chokes the Best Obtainable, perfect insulation, regulation and reliability.  
**HOYNE'S** Transformers, used by many well-known set manufacturers after testing all others.  
**HOYNE'S** Transformers, fitted with tapped and screened primaries, filaments all centre tapped, stout cast aluminium clamps and clearly marked terminal strips are fitted to all models.  
**HOYNE'S** Components are Guaranteed for One Year; built to your own specification at very competitive prices.  
**HOYNE'S** Components. The components you will eventually use, start right; a dud cannot pass the Hoyne test.  
**HOYNE'S** A.V.C. Three, 275-0-275v. 60-70 m.a., 4v. 2-5a., 4v. 4a., 12/6, post 1s.; choke, 30 henry 50 m.a., 7/6, post 6d.  
**HOYNE'S** New Monodial Transformer, 425-0-425v. 120 m.a., 4v. 3a., 4v. 1a., 4v. 1a., 4v. 6a., 24/-. post 1/3; weight 10lb.; 10 henry choke, 6/-. post 6d.; 20 henry choke, 7/6, post 6d.  
**HOYNE'S**—250-0-250v. 60 m.a., 4v. 1-2a., 4v. 2-4a., 10/-. post 9d.; with extra 4v. 1-2a. winding, 12/6, post 1/-.  
**HOYNE'S** Ferrocart Model.—350-0-350v. 60-70 m.a., 4v. 2-3a., 4v. 2-4a., 12/6, post 1/-.; with extra 4v. 1-2a. winding, 13/6, post 1/-.  
**HOYNE'S**—350-0-350v. 120 m.a., 4v. 2-3a., 4v. 4-6a., 4v. 1a., 4v. 1a., 16/-. post 1/3.  
**HOYNE'S**—500 450-0-450-500v. 140 m.a., 4v. 2-4a., 4v. 4-6a., 4v. 2a., 4v. 2a., 27/6, post 1/3; weight 11lb.  
**HOYNE'S**—0-110-135v. 90 m.a., suitable for H.T. 6 or 7, 7/6, post 9d.; with 4v. 2-4a. winding, 9/6, post 9d.  
**HOYNE'S**—200v. 200 m.a., 4v. 2-4a., 4v. 1-2a., for H.T. 8, 13/6, post 1/-.  
**HOYNE'S**—Auto Transformers, Chokes and Filament Transformers always in stock.  
**HOYNE'S** Components Still Have No Equal.  
**J. HOYNE, Offices and Works, 8a, Gladstone Rd., Wimbledon, S.W.19. Tel.: Liberty 3303. [3730]**

**REGENTPHONE** D.C. H.T. Unit and Trickle Charger; £5/-.—Brown, 4, St. Joseph's Rd., Weston-super-Mare. [3722]  
**DAVENSET** £10/10 Charger, as new, hardly used; first £8 secures.—Unique Radio, 70, Broadway, Chesham. [3742]  
**A.C. Valve Charging Boards** (unused), outputs 20/25/50 volts, 6 amps.; list £14, for £5/10.—Jersey, Cunnor Hill, Oxford. [3675]

# ROLA

*the World's Finest Reproducers*



## ROLA CLASS B SPEAKER AMPLIFIER UNIT

*The Mighty Voice of Radio Realism*

Five seconds spent in connecting this unit brings the magnificent volume of the All-Mains set to the owner of the battery receiver. With output and sensitivity increased about five times all the realism of the studio can be enjoyed in the comfort of your home.

**Model A—For Mullard P.M. 2B, B.T.H. PD220, Cossor 220B, Givac B220, Marconiphone B21, G.E.C. B21, Clarion B22.**  
**Model B—For Cossor 240, Ferranti HP 2, Clarion B24.**

**PRICE**  
 (Both Models less Valve)  
**57/-**

### Class B Speakers

Class B Speakers suited to the characteristics of all Class B valves are included in the Rola range. Write for complete list to-day.

### Extension Speakers

There is a correct Rola Extension Speaker for practically all British radio receivers. Write for list.

**THE BRITISH ROLA CO. LTD.,**  
**Minerva Road, PARK ROYAL, N.W.10.**  
 Phone: Willesden 4322-3-4-5.

**ROLA SPEAKERS**  
 for better Radio Reception



**Mains Equipment.—Contd.**

**SERADEX** Products, specified for "The Wireless World" Monodial, D.C. Superhet., Modern Battery, etc.  
**SERADEX** Mains Equipment, new catalogue now ready free for stamp.  
**SERADEX** Filter Chokes.—Type C256, constant inductance, 25 h. at 60 m.a., 370 ohms, 12/6; C251, 25 h. at 120 m.a., 260 ohms, 15/-; C252, 25 h. at 150 m.a., 160 ohms, 16/6.  
**SERADEX** Type B Filter Condensers, 1.0 mfd., 1/6; 2.0 mfd., 2/3; 4 mfd., 4/5; 4x4 mfd., 7/3; 8x8 mfd., 14/6.  
**SERADEX** Mains Transformers, super type, with engraved terminal strips, stripped type, with colour coded leads, screened primaries, 200-250-250 volts.  
**W.H.S.**, for H.T. 11, 300v. 550 m.a., 4v. 2½a., 4v. 2½a., 4v. 3-5a., C.T.D. 45/-; W.H.S., as above, stripped type, 37/6.  
**OUR** Full Range of Catalogues is Available for Stamp, including rectifiers, eliminators, battery chargers, resistances, condensers, mains equipment, etc.  
**TREVOR PEPPER**, 575, Moseley Rd., Birmingham [3764]

**A.C. or D.C. Chargers** for 2 to 200 Cells at Low Prices; state requirements; dynamos and rotaries in stock, all sizes; Brown's Genemeter, battery superscuders for H.T. for 2v. or 6v. input, 37/6 and 52/6; television and sewing machine universal motors, 25/-; lists.—Electradix Radios, 218, Upper Thames St., E.C.4. [0398]

**CABINETS.**

**RADIO-GRAM** Cabinets; fully illustrated list free; remarkable values.—Gilbert, Cabinet Maker, Swindon. [1686]  
**EPTON** Leads Again!—Handsome walnut cabinets: Regentone, 18½x15x9, 12/6; Atlas, 16½x12½x9, 11/9; Alba, 18x14½x10½, 14/-; Philco, 15x12½x7¼, unpainted, drilled, 7/6; ditto, polished, undrilled, 10/6.—Epton, 93, New Rd., Chingford, E.4. [3765]

**DYNAMOS, ETC.**

**MARCONI** Motor Generator, 600 volts, 50 m.a., universal input, starter, main switch fuses, choke; bargain, £6.—G5PH, 25, Marion Rd., Smethwick. [3733]  
**ROTARY** Converters, 220 volts D.C. to 200 volts A.C., capacities up to 0.44 K.V.A., from £4/10.—Milo Engineering Works, Milo Rd., East Dulwich, S.E.22. Phone: Sydenham 4422. [3641]

**GRAMOPHONES, PICK-UPS, ETC.**

**NOVOTONE**, type J, perfect, as new; 33/-.—40, Harrington St., London, N.W.1. [3725]  
**B.T.H.** Senior Universal Motor, without stop; 50/-.—Haigh, 50, Algonson St., Grimsby. [3738]  
**EPTON** Leads Again!—Famous Blue Flyer induction gramophone motors, with turntables, brand new; listed £6/6, 29/6.—Epton, 93, New Rd., Chingford, E.4. [3767]

**LOUD-SPEAKERS.**

**ROLA** Class B Speaker Amplifier Units; listed 57/-, 37/6.—1, Greenwood Gardens, N.13. [3732]  
**B.T.H.** RK Moving Coil Speakers, guaranteed new, unused, manufacturers' surplus, original price.  
**6** Guineas, highly sensitive and wonderful tone response, will handle up to 10 watts output, available for 6v., 100v., 200v. D.C., 30/-, also A.C. models.  
**£2/10**; carriage paid, c.o.d. or cash with order; the best value in speakers obtainable to-day.—O. H. Seekamp, First Avenue House, High Holborn, London, W.C.1. Phone No.: Holborn 6609. [1425]  
**£12/10** Epoch Domino A.C. model, O.T.D.8 transformer, £5; owner purchased radiogram.—Cirket, Welbeck St., Kirkby, Notts. [3715]  
**10/-**—Lamplugh Silver Ghost, 1,000 ohms, with output transformer, unopened, list 47/6, last few; c.o.d. carriage paid.—Kay, 167, City Rd., E.C.1. [3761]  
**30/-** !!!—B.T.H. R.K. moving coil speakers, 6in. cone, new and unused, guaranteed; these speakers are the type as used in cinema sound equipment; suitable for public address work; weight 30lb., and vastly superior to the cheap speakers now on the market, 100 volts, 150 volts, and 200 volts D.C.  
**27/6** !!!—6-volt D.C. speakers, as above; £2/7/6 speaker as above for 100-250 volts A.C., complete with field rectifier.  
**B.T.H.** Transformer, brand new, ratios 1-1, 2-1, 20-1, and 30-1 microphone; 7/- each.  
**CARRIAGE** Paid, cash with order, or c.o.d.—Ward, 12, Tredegar Rd., B.W. E.3. Tel.: Advance 3668. [3771]  
**H.D. RADIO ELECTRICAL SERVICE** Offers Surplus of a Set Manufacturer; every article guaranteed new; Moving coil speakers, Magnavox, type D.C.144, 2,500 or 7,500 ohms resistance, with multi ratio transformer, at 18/-; type D.C.142, same voltages, at 25/-; automatic record changers, Garrard, 1933, complete with pick-up, A.C., list £10, at £7/15; gramophone motors, Collaro, complete with pick-up and volume control, list 80/-, at 3 guineas, all goods carriage paid; cash with order or c.o.d.; callers only, between 1 and 6 p.m.—No. 9, Kingley St., Regent St., London, W.1. [3758]

**VALVES.**

**THE M.R.D. Co.'s** Own New British Valves, guaranteed 6 months, carriage paid; we invite tests against any other make.  
**2-VOLT** Range.—V.M./S.G., S.G.2, 7/6; L.F.2, H.F.2, H.L.2, R.C.2, 3/6; driver, 4/-; P.2, 4/6; Pen.2, 10/-; Class B, 1½ watts 9/-, 3 watts 9/-.  
**A.C. Range.**—V.M./S.G.A., S.G.A., 12/6; H.L./A.C., L.F./A.C., 7/6; P./A.C., 8/6; Pen./A.C., 15/-; details and characteristics on request.—Mains Radio Development Co., 4-6, Muswell Hill Rd, London, N.6. [3776]

## THE MERCILESS TEST OF AN EXHIBITION

Another letter from our Postbag

"Please allow me to congratulate you on your production THE HARTLEY-TURNER LOUD SPEAKER. Before visiting the Manchester Radio Exhibition, I was convinced that I had one of the best speakers possible; it is one of a very well-known make. I was interested in comparing the different speakers by ear and not by advertisement. (I might mention that I am a musician of 15 years' standing and a radio enthusiast for 10), and I can honestly say that your speaker was the one that stood out and was a big improvement compared with the rest of the exhibitors' models. Wishing you every success.

(Signed) L. A. Halliwell."

### DEMONSTRATIONS BY APPOINTMENT

If you cannot call send a 1½d. stamp for our 32-page technical booklet "NEW NOTES IN RADIO."

D.C. MODEL £7.7.0  
A.C. MODEL £8.8.0

**HARTLEY-TURNER RADIO LTD.**  
Thornbury Road, Isleworth, Middlesex  
Telephone: Hounslow 1854.

**TRIPLE-TESTED AND GUARANTEED**



Three severe tests are carried out on every Savage mains transformer before it leaves the works—300% over voltage test, interwinding resistance, and regulation test. A faulty instrument couldn't get past. That is why hosts of experienced radio men and manufacturers are so enthusiastic about Savage mains equipment. You can be sure of it! Savage quality is Guaranteed. Extra-special service on 'Wireless World' Specifications. Send for list of standardised types.

**SAVAGE**  
**MAINS TRANSFORMERS**  
56/58, CLERKENWELL ROAD, E.C.1  
Phone: Clerkenwell 3068/9.

### Valves.—Contd.

**EPTON Leads Again!**—American 280, etc., 9/11; 236, etc., 11/6; Triotron 8431N (A.C.S.G.), 6/6.—Epton, 93, New Rd., Chingford, E.4. [3766]

**THE** Following English, American and Continental valves in stock; Philco, Triotron, Tungstram, Hivac, and 323 valves; prompt attention.—Newman, 309, Roman Rd., Bow, E.3. [3699]

**ALL** Latest Types of Brand New American Valves, first class makes: 247s, 235s, 224s, 236s, 237s, 235s, 245s, 244s, 12/-; 227s, 226s, 280s, 245s, 9/6; 242s, 232s, 11/-; U.X.210s, 15/-; U.X.250s, 7 watts output, 16/-; 281s, 14/6; post paid, cash with order or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3772]

**SPECIAL Offer.**—Valves by world-famous Continental manufacturers, fully guaranteed, screen grid, variable mu screen grid, high magnification screen grid, low magnification screen grid, H, HL, L, RO, power, super power, directly heated pentode, directly heated power pentode; all the above standard mains type, 4/6 each; 300v. 60 milli-amp. rectifier 5/6, 350v. 120 ma. 6/6, 500v. 125 ma. 7/6; the following 4 volt battery valves at 2/- each, H, HL, L, power, screen grid.—Premier Supply Stores, 20-22, High St., Clapham, S.W.4. Macaulay 2188. [3795]

### COMPONENTS, ETC., FOR SALE.

**R.** **SELECTED** Parts for Sale, as new, any c.o.d. or "Wireless World" deposit system, which we recommend if in doubt as to the splendid value offered; we take risk of damage in transit to customers; goods tested for callers and guaranteed.

**RYALL'S** Mains Transformers, 250v. 60 m.a., 4v. 1 amp., 4v. 3 amp., 10/6; 350v., 12/9; H.T.7/12/13 with 4v. 4 amp., 10/6; H.T.8, 12/9; 4v. 3.5 amp., 8/9; 4v. 3 amp., 6/9; chokes, 20H. at 100 m.a., 8/9; 15H. at 60 m.a., 6/9; resistance 230 ohms, 25H. at 60 m.a., 6/9; resistance 430 ohms, 40H. at 100 m.a., resistance 600 ohms, 10/6.

**WE** Hold a Large Stock of First Class Radio Apparatus, meters, resistances, heavy chokes, in addition to the goods advertised.

**SPECIAL Offer** of 3v. and Rectifier (valve) Chassis, from Yagerphone, all guaranteed, new and very well made; chassis only 50/-; with valves, 90/-; carriage forward.

**METERS**, moving coil, made for Ryall's Radio, guaranteed one year, and to B.E.S. first grade specification, all panel flush type, bakelite case, 0.5 m.a., 0-20 m.a., 0-50 m.a., 21/- each; 0-250v., 32/6; 0-300v., 35/-; 1,000 ohm per volt, zero adjuster, size 3¼in.

**METERS** as above, moving iron, first grade, air damped, zero adjuster, 0-250v. A.C., 18/-; 0-50 m.a. A.C. and D.C., 15/-; non damped, without zero, 0-12v., 10/-; 0-250v., 12/-; 0-3 amps., 10/-; 0-20 m.a. A.C. and D.C., 10/-; 0-50 m.a., ditto.

**SUITCASE** Type Cases, in best crocodile leather, 14x14 x8, ample room for 12in. turntable and pick-up, 10/-; set cabinets for 3v. A.C. sets, room for speaker, good appearance, 10/-.

**B.T.H.** Universal Senior Gramophone Motors, A.C. or D.C., new, complete with auto stop and all fittings; 55/-.

**FERRANTI** D3 Speaker, 200-250v., 27/6; Celestion P.M.29, 45/-; Blue Spot new 99P.M., 39/6; Blue Spot 32P.M., walnut, £2/15; B.T.H. Junior A.C. speaker, with corrugated cone, separate certifier, 67/6; Epoch 99½ 6v., 45/-; A4 rectifier, Parmeko transformer, T.C.C. 2,000 m.f. with same, only 37/6.

**LAMPLUGH** Senior D.C. Speakers, 2,200 ohm, 8½in. cone, 13/6; Magnavox D.C.144, 2,500 ohms, 18/6; Lamplugh Junior D.C. 2,200 ohms, 9/6; B.T.H. D.C. 200-250v., with transformer, 18/6; B.T.H. Senior P.M., with transformer, late model, £3.

**PHILIPS** 6 amp. Charger, complete, 60/-; Morrison 6 amp. charger, 2 line, with meters and H.T., £5; P.A. set with radio, 10w. A.C. output, entirely complete, modern, £20; Ferranti portable meter, 200 ohms per volt, 250v., 10v. 100 m.a., 45/-; Westinghouse H.T.1, with Foster transformer, 25/-; Ediswan 1½ amp. charger, 15/-; Ferranti S.4V, transformer, 10/-; Vortexion 250v. 120 m.a. 4v. 2 amp., 4v. 7 amp., 6v., 15/-.

**T.C.C.** 2 m.f. 350v. Working, 1/6; T.C.C. 1 m.f., 350v. working, type 84, 1/5; T.C.C. 0.01, mica, type M, 6d.; T.C.C. 4x4 m.f., 4/-; H.M.V. 4x4 m.f., 3/6; T.C.C. 4x4x1x1x½ m.f., 4/9; H.M.V. ditto, 4/-; all 250v. working; Triotron, 8 m.f. 450v. working, 3/6, electrolytic; T.C.C. 2,000 m.f. electrolytic, 12v. working, 8/6; T.C.C. 250 m.f., 100v. working, 8/6; T.C.C. 500m.f. 40v. working, 8/6, post 9d. on all blocks; T.C.C. 15 m.f. electrolytic 100v. working, new, 1/3.

**POLAR** Star Senior 3-gang Condensers, new, 15/-, with drive 16/6; Radiophone 3-gangs, complete with cover, drive, etc., new, 15/9; Radiophone 4-gangs, 12/6, with cover, drive and all fittings, 17/6; Radiophone 4-gang super het. type, fully screened with trimmers, Radiopack type, 9/-, post 9d.; Lotus fully screened 4-gangs, new, trimmers on top, 15/-.

**COLLARO** A.C. Motor with Pick-up, complete unit, 52/6; Marconi K17, 25/-; Rola Class B speaker amplifier unit, with P.M.2B valve, 50/-, new; Regentone W.I.D. eliminator, 120v. 20 m.a., 20/-; Ekco 15-25 m.a. D.C. eliminator, 22/-; Garrard D/S meter on unit plate, No. 30, 21/-.

**RYALL'S RADIO**, 33, Chancery Lane, London, W.C.2 (nearest Tube, Chancery Lane; bus 67 passes door or tram to Savoy St.), Holborn, 3529. Open Saturday afternoon. Close 7 p.m., Saturday 6 p.m. Thursday closed 1 o'clock.

**R.** [3727]

**MILDWAY RADIO EXCHANGE** Offers the Following, sound and perfect.

**FERRANTI** A.F.4, 8/-; A.F.3, 11/-; A.F.5, 17/-; A.F.5C., 19/-; A.F.5C.C., 21/-; A.F.7C., 19/6; O.P.M.13C., 14/-; O.P.M.1C., 14/-; O.P.M.2C., 14/-; O.P.M.3C., 14/-; O.P.M.1, 10/-; O.P.2, 8/6, 25/-; O.P.1, 11, 7/6; O.P.4C., 12/-; O.P.M.8, 10/-; B.3 chokes, 8/6; B.5, 16/-; Varley Rectatone, 7/6; compensating, 7/-; Nicore 1, 9/-.

(This advertisement continued on next page.)

## MORE STATIONS

are every day crowding each other and making clear reception almost impossible. Don't put up with that annoying background that interferes with the complete enjoyment of your set.



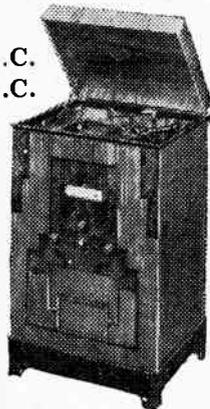
A Pix fixed in your aerial will reduce interference to a minimum on any set, because it sharpens tuning to a knife edge and enables you to enjoy programmes outside the range of your set. Try one to-day. Send us 2/- P.O. If you are not completely satisfied with the result return it to us for full refund. The British Pix Co., Ltd. (Dept. 24), 118, Southwark Street, S.E.1.

**2/-** **FIX A PIX** FOR BETTER RADIO  
WITH HANDY HOLDER 26

## THE ONLY all mains BRITISH RADIOGRAM WITH AUTO RECORD CHANGER at the Price

**25 GNS.** A.C. D.C.

WITH GARRARD AUTO RECORD CHANGER As Illustrated.



THE:— **H.S.P. RADIOGRAM**

Send for Illustrated Lists.

Name

Address

We are Actual Makers. Handsome Cabinet, Radiogram plays eight tunes, Coil Speaker. Agencies vacant.

**H.S.P. WIRELESS CO. LTD.**  
Langford Works, Weston-Super-Mare.

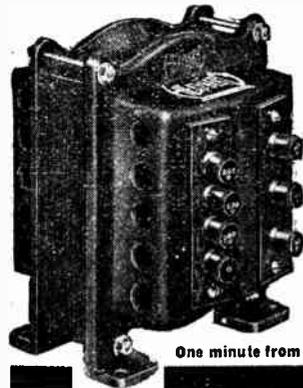


**The Sign of first-class mains TRANSFORMERS**

Look for the Heyberd trade-name when buying Mains Transformers—you can then be certain that you are getting the product of Mains Specialists of many years' standing. Heyberd transformers are manufactured from carefully chosen British materials, and severely tested at every stage of production. Special cast metal end-plates protect the windings from mechanical damage and insulated plug-in terminals complete a thoroughly safe job. Voltage regulation is extremely good—with negligible temperature rise. Here is a powerful model for use with valve rectifier:

**Type 806 Transformer.** Secondary Outputs: 500-500 v. 120 ma. L.T. 2+2 v., 2½/3½ amps. 2+2 v. 5/6 amps. and 2+2 v. 2 amps.

Price ... .. **65/-**



Cut out this ad. and send to-day, with 3d. stamps, for 36/- Combined Handbook and Catalogue of Heyberd Mains Apparatus. Packed with circuit diagrams, hints and data.

**HEYBERD 10, FINSBURY STREET, LONDON, E.C.2**

One minute from Moorgate Und. Station.

**ELECTRADIX BARGAINS**

**THE DIX-ONEMETER**

The ideal of multi-range, moving-coil meters. Built to first-grade British Engineering Standard. 50 ranges on one meter. Measures Microamps to 20 amps, millivolts to 1,000 volts, 50 ohms to megohms. Six Terminals. Two clear scales, mirror, and knife-edge pointer for accurate reading.

Complete in case

**60/-**

(Multipliers extra).

Test Booklet "W" Free.



**THE DIX-MIPANTA VEST POCKET TESTER**

A wonderfully versatile moving iron multi-range meter for service on A.C. jobs. No projecting terminals. THREE ranges of volts: 0-75, 0-150, 0-300. Used for MILLIAMPS reads: 0-12½ m/A., and 0-75 m/A. In black bakelite case. Measures only 2½ in. by 2½ in. Complete with pair of test leads and plugs ... ..

**19/6 A.C. & D.C.**

Leaflet "M.W." gives full information.

**MICROPHONES.** All prices, all purposes. We are makers and carry the biggest and most varied stock in London. Our famous Button insets for detection experiments are only 1/-; L.R. Volume controls, 6d. For making your own Mike, Carbon Granules in glass capsule, Grade 1, 8d.; No. 2, 1/-; No. 3, fine, 1/6; No. 4, extra fine, 2/-; Back Blocks, 3d. Diaphragms, 4d. Button, with 2in. mica diaph., 1/6. Mounted on pedestal, 2/-; Hand Mikes in 2in. case, No. 11 at 5/6; Superior Type, No. 11B, 7/6. Fay Mikes, factory throwouts, 8/-; Lesdix No. 10B Pedestal 10in. high, 12/6. Lesdix Superior No. 12BB Ring 14in. Pedestal 18/6. Lafone-Reisz Hand Mike, 52/6. Genuine Allen-Reisz Table Model, 55/-; W.E. Table Model Semi-Reisz, 5in. dia., for lectures, 35/-; First class Studio Recording Mikes, as new, ex a talkie studio, Edison Bell, Goodson Grams, etc., B.T.H. Moving Coil P.M. £5; Amplicon, £5; Browns D. £12; Voight Electrostatic, £10; Igranic Transverse, £13 10/-; Western Electric P.A., £14; Siemens H. Ribbon, £50 Moving Coil for £20, famous Marconi-Reisz B.B.C. Model, £25.

**ELECTRADIX RADIOS,**

218 UPPER THAMES ST., E.C.4

**Components, etc., for Sale.—Contd.**

(This advertisement continued from previous page.)

**WESTON** Type 506 Meters, 0-10 volt, 0-20 amps., 8/- each; 0-150 volt, 14/-; 0-10 m.a., 14/-; 0-50 m.a., 14/-; Ferranti 0-100 m.a., 17/6; triple range type, 213.F., 30/-; V.T.1 valve tester, 50/-; turner, 0-25 m.a., 10/-.

**COLVERN**, pair K.B.L.C. and K.G.R., mounted on "W.W." chassis, 19/- each; pair K.B.L.C. and K.53, 18/-; Wearite and Lewcos superhet coils, 4/6 each; pair Wearite I.F. transformers, 12/-; Lewcos 126/T.O.S., 5/-; A.T.G., 5/-; set Watmel superhet coils, 12/6; Colvern K.21, K.22, K.23, 15/-; Lewcos Band Pass filters, 6/- each.

**ELEX** Shortwave Adaptor, 17/6; Cyldon 2-gang extender's condensers, 12/6; Polar 2-gangs, fully screened, 7/6; pair Bulgim mains I.F. chokes, 10/-; Westinghouse H.T.10, with Heyberd transformer, 30/- pair.

**B.T.H. Senior P.M. Speaker**, 50/-; Junior D.C. mains, 30/-; Ferranti P.M.3, 27/6; pair Rola 6,500 D.C. speakers, 30/-; pair Rola Class B matched speakers, P.M., £2.

**COLLARO** Type 32 Combined A.C. Motor and Pick-up, fully automatic plate, 59/6; Collaro Empire model, less pick-up, 37/6; Garrard type A.C.4 motor, with fully automatic plate, 32/6.

**ALL** Post Paid.

**OPEN** Thursday, closed Saturday all day.

**PHONE:** Clissold 5001.

24, Mildmay Grove, London, N.1.

[3728

**PREMIER.**

**PREMIER SUPPLY STORES** Offer the following Set Manufacturers' Surplus New Goods at a fraction of the Original Cost, all goods guaranteed perfect, carriage paid over 5/-, under 5/- postage 6d. extra (Ireland, carriage forward).

**ELIMINATOR** Kits, including transformer, choke, Westinghouse metal rectifier, T.C.C. condensers, resistances and diagram, 120v. 20 m.a., 20/-; trickle charger 8/- extra; 150v. 30 milliamps, with 4v. 2-4 amps. C.T., L.T. 25/-; trickle charger, 6/6 extra; 250v. 60 milliamps, with 4v. 3-5 amps. C.T., L.T., 30/-; 200v. 100 milliamps, with 4v. 3-5 amps. C.T., L.T., 49/6; 300v. 60 milliamps, with 4v. 3-5 amps. C.T., L.T., 37/6.

**T.C.C. Condensers**, 750v. working, 2 mf. 3/6, 4 mf. 6/-, 4 mf. 450v. working 4/-, 250v. working 1 mf. 1/-, 2 mf. 1/9, 4 mf. 2/6, 1,500v. working Standoff insulators 0.5 mfd. 1/6, 2 mfd. 6/-, aqueous electrolytic 440v. working, 4 mf. 3/-, 8 mf. 3/6.

**ALL** the Following Lines 6d. each or 5/- per dozen: 4- and 5-pin chassis mounting valve holders; shielded screen grid or pentode leads 1-watt wire end resistances, any value; 0.1 condensers; on-off switches push-pull; polar ganging devices; 0.02 condensers, 0.5 condensers.

**POLAR** 3-gang 0.0005 Condensers, split end vanes, totally screened disc drive; 6/11.

**MSCO** Triple-gang 0.0005 Condensers, with trimmers, 4/11.

**T.C.C. Electrolytic Condensers**, 100 volts working, 15 mfd.; 1/3.

**PREMIER** Chokes, 40 m.a., 25 hys., 4/-; 65 m.a., 30 hys., 6/-; 150 m.a., 30 hys., 10/6.

**PYE** Chokes 20 or 32 hys., 4/-; Premier multi-ratio output transformers, giving 15 different ratios, 7/6.

**AMPLION** High Inductance Chokes, resistance 2,500 ohms, 80 henrys, 60 m.a.; 5/6.

**WESTINGHOUSE** Metal Rectifiers: 120v. at 20 m.a., 6/6; 180v. at 30 m.a., 8/6; 8v. at ½ amp., 6/6; 6v. at 1 amp., 9/6.

**HARLEY** Pick-up, complete with arm and volume control; 12/6.

**BRITISH RADIOPHONE** Wire Wound Potentiometers, with mains switch incorporated, 5,000 ohms, 10,000 ohms, 50,000 ohms, 100,000 ohms, 250,000 ohms, any value; 3/6.

**KOLSTER BRANDES** Gramophone Motors, dual type, can be worked by clockwork or mains, No. 1 induction type 100-250 volts, 27/6; No. 2, A.C. and D.C., 100-250 volts, 27/6; both the above complete with all fittings and turntable.

**SPECIAL Offer.**—Microphones by prominent manufacturer, high sensitivity, uniform response, complete with stand, transformer and battery; listed £3/15, our price 18/6.

**DUBILIER** Condenser, 300v. working, 4+4+2+2+2+0.1 +0.1+0.1, 6/-; 1,000v. working 1 mf., 1/6.

**PREMIER** British Made Meters, moving iron, flush mounting, accurate; 0-15, 0-50, 0-100, 0-250 milliamps, 0-1, 0-5 amps., all at 6/-.

**ORMOND** Condensers, 2-gang, semi shielded; 2/6.

**SPECIAL Offer of Mains Transformers**, manufactured by Philips, input 100-115v. or 200-250v., output 180-0-180 volts, 40 m.a., 4v. 1a., and 4v. 3a., 4/6; 200-0-200v., 4v. 1a., 4v. 3a., 4/6.

**ALL** Premier Guaranteed Mains Transformers have engraved terminal strips with terminal connections, input 20-250 volts, 40-100 cycles, all windings paper interleaved.

**PREMIER H.T.8** Transformers, 250v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 25/-.

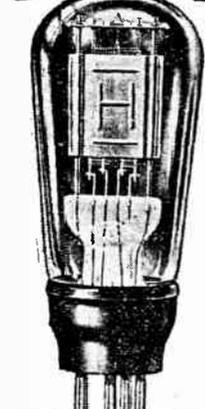
**2,000+2,000** Electrolytic, 12 volts working; listed 27/6, at 10/-.

**PREMIER H.T.9** Transformer, 300v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 25/-.

**PREMIER H.T.10** Transformer, 200v. 100 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.

(This advertisement continued on next page.)

**Best between Aerial and Earth**



**HIVAC**

The range of Hivac high quality British made valves at low prices, covers an exact replacement for every type of 2-volt battery valve now in general use.

**FIT HIVAC Maintain Efficiency and Reduce Cost.**

The "Wireless World" said:—

"Tests made with... Hivac valves in a recent 'Wireless World' receiver gave results in every respect comparable with those they replaced, selectivity, sensitivity and volume being sensibly the same and the performance of the receiver was entirely satisfactory from every point of view."

PRICES FROM

**4/6 TO 12/6**

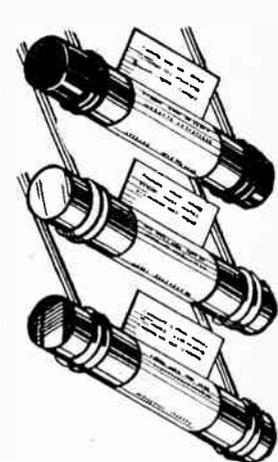
**HIVAC VALVE GUIDE "W"** gives our complete range, and a comparative table of other makes and their Hivac equivalents.

Write Now for a Free Copy.



**HIGH VACUUM VALVE CO. LTD., 113-117, FARRINGDON ROAD, E.C.1.**

**ERIES FOR THE "A.V.C." THREE**



**EVERY Set designer can't be wrong!**

Here are Eries specified again—as they always must be for surer results. 11 Eries Resistors and 2 Grid Leaks for the "A.V.C. Three."

Eries give you the fullest possible efficiency. They are unconditionally guaranteed against breakdown.

By a special process of impregnation they are rendered absolutely immune from any tendency towards disintegration. Safe! Silent!

All the leading manufacturers use Eries and all the leading set designers recommend them. They can't all be wrong.



**1/- PER WATT in all VALUES**

Colour-coded and labelled. Look for the Eries Kits on your dealer's counter—every value you want ready to hand.

**RADIO RESISTOR Co., 1, Golden Sq., Piccadilly, London, W.1.**

Components, etc., for Sale.—Contd.

(This advertisement continued from previous page.)

MAGNAVOX, D.C.144, 2,500 ohms field, with hum-bucking coil, Pentode transformer, 17/6; complete with A.C. conversion kit, 27/6.

DOUBLE Spring Motors, made by Garrard, play five sides of 10in. record, complete with turntable and all fittings; 17/6.

MICHAEL 2-screen Grid Pentode Transportable 4, complete; gets many stations; £6/15.

SPECIAL Offer.—A-cumulator chargers, input 200-250v. A.C., to charge 2- and 4-volt accumulators at 1/2 amp.; owing to the high efficiency of the silver oxide rectifier employed charger may be used during broadcast; 9/6 each.

RELIABLE Canned Coils with circuit; 3/-, accurately matched; dual range.

PREMIER L.T. Supply Units consisting of Premier transformer and Westinghouse rectifier, inputs 200-250 A.C. output, 8v. 1/2 amp., 11/6; 8v. 1 amp., 14/6; 15v. 1 amp., 19/-; 6v. 2 amp., 27/6; 30v. 1 a., 37/6.

PREMIER Mains Transformer, output 135v. 80 m.a., for voltage doubling, 8/6; 4v. 3-4a., c.t. L.T. 2/- extra; Westinghouse rectifier for above, giving 180v. 30 m.a., 8/6.

PREMIER Mains Transformers, output 250-0-250 volts 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened screened primary, 15/-.

PREMIER Mains Transformers, output 350-0-350 volts, 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary; 15/-.

PREMIER Mains Transformers, output 400-0-400 volts, 100 m.a. 4v. 4-5a., 4v. 2-3a., with screened primary; 15/-.

PREMIER Auto Transformers, 100-110/200-250 volts or vice versa, 60-watt, 7/9; 100-watt, 10/-.

SPECIAL Offer of Manufacturers' Type Transformers, any input, output 250-0-250 volts, 60 m.a., 4v. 1a., 4v. 3a. (both c.t.), 8/6; H.T.8 transformer, with 4v. 3-4a. (c.t.), 8/6; with rectifier, 18/6.

AMPLION Mains Transformers, input 100-250 volts, output 350-0-350 volts, 120 m.a., 4v. 5a., 4v. 2a., 6v. 1a. (all c.t.); 17/6

FILAMENT Transformers, polished and engraved terminal boards, N.P. terminals, 4v. 3-4a., 5/-; 10v. 3a., 6/6; 12v. 1a., 5/-; 4v. 4-6a., 6/6; 14v. 4a., 6/6; 22v. 1a., 6/-; 6v. 2a., 5/-; 9v. 1a., 5/-; 35v. 3a., 15/-.

PREMIER Eliminators, input 200-250 volts, 40-100 cycles, A.C., incorporating Westinghouse metal rectifiers, output 250v. 60 m.a., S.G. and 120v. taps, 42/6; with 4v. 4a. c.t. L.T., 7/6 extra.

PREMIER Eliminators, output 150v. at 30 m.a., S.G., and 100v. 'apt, with 4v. 3-4a. c.t. L.T., 37/6; or with trickle charger, 42/6

PREMIER Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps, 27/6; with L.T. trickle charger incorporated, 35/-.

PREMIER D.C. Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps; 15/-.

ACCUMULATOR Chargers, 200-250 volts A.C., all incorporating Westinghouse metal rectifiers; 2, 4, and 6v. at 1/2 amp. 2/5, 2/-, and 6v. at 1 amp., 17/6; 12v. 1a. 27/6; 6v. 2a., 35/-; 12 v. 1.5a., 30/-; 6v. 3a., 39/6; 30v. 1a., 42/6; 50v. 1a., 62/6.

B.T.H. Induction Type (A.C. only) Electric Gramophone Motors, 100-250 v., 30/- complete.

AMPLION Moving Coil Speakers, type E.M.644, dual fields 2,500 and 5,000 ohms (100 and 200v.), with output transformer, 12/6; A.C. conversion kit for this speaker, 10/- extra.

WESTERN ELECTRIC Condensers, 250v. working, 1 mfd. 6d., 2 mfd. 1/-; 500v. working, 1 mfd., 1/-.

T.C.C. Condensers, 250v. working 4x4x1 mfd., 3/6; 6x4x2x2 mfd., 375v. working, 6/11; 4x4x1, 6/-.

SPECIAL Offer of Wire Wound Resistances.—4 watts, any value up to 10,000 ohms, 1/-; 8 watts, any value up to 15,000 ohms, 1/6; 15 watts, any value up to 50,000 ohms, 2/-; 25 watts, any value up to 50,000 ohms, 2/6; 50 watts, any value up to 50,000 ohms, 3/6.

WIRE Wound Potentiometers, 15,000 ohms, 1/6; Centralab Potentiometer controls, 50,000 ohms, 2/-.

FOR Callers Only.—The following valves, guaranteed new:—

PHILIPS 328 Valves for L.T. Charging, 5/6; 329 Barreter lamps, 2/-.

PREMIER SUPPLY STORES, 20-22, High St., Clapham, S.W.4. Macaulay 2188 Closed 1 o'clock Wednesdays, open to 9 o'clock Saturdays. Nearest Station, Clapham North Underground.

PREMIER. [3778]

PEPPER'S Clearance Sale.

OWING to the omission of the following from our advert. last week, we have decided to extend our clearance sale until the 31st.

POLAR Ideals, Ormond, etc., S.M. variables. 2 6; Ormond No. 4 Polar, Lotus, etc., variables, 1, 9, 17/6 per dozen.

PYE, Lotus, etc., differentials, 1/6 each, 13/6 dozen; plain reactions, 1/3 each, 12/6 dozen.

PRESET Condensers, various makes and capacities, 9d. each; neutralising condensers, 6d. and 9d.; dials, Ormond, Brownie, etc., 1/3; Formio drum controls, 3, 11; large Indigraphs, 1/9 each.

CHOKES.—Hypercores (second-hand), 8/9; Parmeko L.T.1, 8/6; B.T.H. L.T. chokes, 6/11; Telson power chokes, 4/6; ditto, 100H., 3/9; Jissen heavy duty, 6/-; Bayliss speaker field replacement, 2,500 ohms, 7/6; Sound Sales ditto, 7/6.

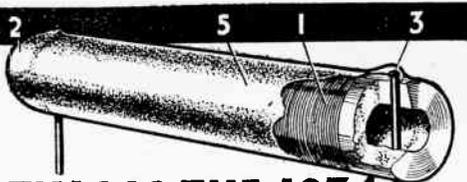
FERRANTI, Varley, etc., wire wound resistances, cart-ridge types, 1/3 each; most values up to 500,000 ohms; holders extra 6d.; grid leaks, Dubilier metalised, etc., 3d. each, 2/9 dozen.

SUNDRIES.—Brown microphone amplifiers, complete, 6/6; Lewcos coil, cans and cases, 6d.

VALVES.—Tungram H210, L210, Triotron S.D.2 2/11; S.P.230, 3/11; P215, 3/3.

ALL Offered Under Our Usual Guarantee; many other bargains.

TREVOR PEPPER, 575d, Moseley Rd., Birmingham, 12. [3763]



THIS IS THE 1934 RESISTANCE — THE HYWATT

Note these Points:

The wire element high grade iron free resistance wire (1) which is wound on a specially prepared porcelain former (2), the ends of the resistance being spot welded (3) to copper connecting leads (4), and the whole resistance coated in "Vita" enamel (5).

This is the most advanced resistance yet put on the market and is already extensively used by leading set makers.

Made in all values from 1-50,000 ohms

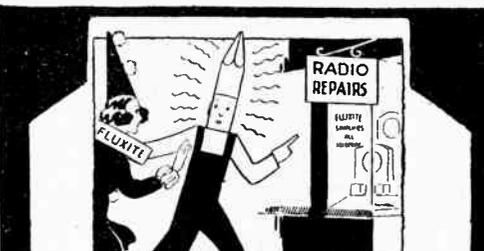
For full details please write to:—

WATMEL WIRELESS CO., LTD., Imperial Works, High Street, Edgware, London.

Telephone: Edgware 0323.



Watmel COMPONENTS GET THE BEST OUT OF ANY SET C.R.C. 96



"We're Fluxite and Solder—the reliable pair: Famous for Soldering—known everywhere!" Here is an EXPERT—that's plain to see! We're SURE of a welcome—Fluxite and Me!"

See that Fluxite and Solder are always by you—in the house—garage—workshop—anywhere where simple speedy soldering is needed.

ALL MECHANICS WILL HAVE FLUXITE IT SIMPLIFIES ALL SOLDERING

All Ironmongers sell Fluxite in tins: 4d., 8d., 1s. 4d., and 2s. 8d. Ask to see the FLUXITE POCKET SOLDERING SET—complete with full instructions—7s. 6d. Ask also for our leaflet on HARDENING STEEL with Fluxite.

FLUXITE LTD., (Dept. W.W.) ROTHERHITHE, S.E.15

FOR ALL REPAIRS!



Components, etc., for Sale.—Contd.

WOBURN RADIO Offer Following Set Manufacturers' Clearance Lines:—

BAKER Selhurst Motor P.M. Speakers, 21/-; spaghetti resistances, all values, 3/- dozen; Clix valveholders, 2/6 dozen; Amplion 0.0005 mica condensers, 9d.; 0.0003 differential, 10d.; Siemens 4 mfd., 500-volt test, 2/3; Hydra 2 mfd., 500v. test, 1/3; block condensers, 1,500v. test, 4x2x2x.5x.5x1, 6/6; Polymet fixed condensers, all sizes, 3/6 dozen; H.M.V. 2-gang 0.0005, 4, 11; 3-gang ditto, 7/11; H.M.V. resistances, 4-000, 5, 10, 100,000, 9d.; colour coded Erie and Dubilier 1/2-watt 4/6, 1-watt 6/6 dozen; Centralab volume control, with switch, 15,000, 1/7; Utah D.C. moving coil power and pentode, 12/11 each.—Woburn Radio Co., 7, Woburn Buildings, W.C.1. Euston 1571. [3792]

SOUTHERN RADIO'S Wireless Bargains.—Set manufacturers' guaranteed surplus.

MAINS Transformers.—250-0-250 volts 60 m.a., 4v. 1a., 4v. 2-3a., 11/-; 250-0-250 volts 60 m.a., 4v. 1a., 4v. 2-3a., 4v. 1a. 12/-; 350-0-350 volts 60 m.a., 4v. 2-2 1/2a., 4v. 2-4a., 13/6; 350-0-350 volts 120 m.a., 4v. 2-2 1/2a., 4v. 3-5a., 4v. 1a., 16/-; 500-0-500 100 m.a., 4v. 2 1/2a., 4v. 3-5a., 4v. 2a., 19/-; step-up or step-down transformers, 0, 100, 110, 200, 230 and 250 volts, 60 watt output 12/6, 100 watt output 14/9.

SMOOTHING Chokes.—20 henrys, 120 m.a., 320 ohms, 8/9; 50 henrys, 60 m.a., 500 ohms, 7/8; 40 henrys, 40 m.a., 700 ohms, 6/6.

ALL Mains Transformers and Chokes Guaranteed for 12 Months, specials quoted for and delivery given within 3 days of order.

VARIABLE Condensers.—Polar 3-gang 0.0005, complete with dial, knob, escutcheon, 11/- (list 35/-); Lotus 2-gang 0.0005, complete with dial, knob, escutcheon, 8/6; all ganged condensers are fully screened, with trimmers, and boxed; Hydra block condensers, new, 16 mfd., 2+2+8-2+14-1, 1,000 volt test, 7/- each; 4 mfd., 2/6; 2 mfd., 1/9; 1 mfd., 1/-.

SPEAKERS.—Rola F6 permanent magnet, 28/- (listed 49/6); D.C. mains energised, 2,500 to 6,500 ohms, complete with humbucking coils and transformers, 16/6 (list 39/6); E.C. Stork speakers, complete in magnificent cabinet, 19/6 (listed £3/15); Ormond speakers, complete in cabinets, 10/- (listed 25/-); Ultra permanent magnet speakers, 95 P.M., 35/- each, a really hefty job (listed £4/15); Blue Spot, 100U, 13/6 (list 37/6).

CONSTRUCTORS' Kits.—Ready Radio "303" battery 3-valve kits, less valves, 18/- each; complete with 3 Mullard valves (P.M.1L.F., P.M.2, 2D.X.), 33/- each (list 70/-); Ready Radio Meteor screen grid 3-valve kit, less valves, 26/-; with 3 Mullard valves (P.M.12a, P.M.2D.X., P.M.2a), 49/- (list £5/7/6); Universal Radio 3-valve kits, ready assembled on chassis, 12/6 (listed 45/-).

READY Radio "303" A Kits, complete with cabinet, M.C. speaker, less valves, £2/5; with 3 Mullard valves (P.M.1L.F., P.M.2D.X., P.M.2), £3/5 (list £6/17/6).

READY Radio Meteor "A" 3-valve Screen Grid Kit, complete with cabinet, M.C. speaker, less valves, £3/7/6; with 3 Mullard valves (P.M.12A., P.M.2D.X., P.M.2a.), £4/10 (list £8/7/6).

READY Radio S.T.400 Kits, as specified by Scott Taggart, £2/19/6 each (list £4/17/6); Mullard Radio for Million 3-valve A.C. kit, complete with 3 Mullard A.C. valves (Pen'V, 354V, 84V), £3/10 (list £6/10); Mullard Radio for Million 3-valve battery kits, complete with 3 Mullard valves, £3/3 (list £6/2/6), all kits brand new, in original sealed cartons.

B.T.H. Senior Pick-ups, 1934 model with volume control, 28/- each (list 37/6); 6 only, B.T.H. Junior pick-ups, 17/6 (list 25/-); H.M.V. volume controls, 1/6 each (list 12/6).

RECEIVERS.—Burgoyne 3-valve battery transportable sets, complete with valves, batteries, accumulator and speaker, £3/2/6 (list (£7/19/6), new, in cartons.

ALL Goods Guaranteed New and Perfect and Sent Carriage Paid.

BRANCHES at 271-275, High Rd., Willesden Green, N.W.10, and at 48, Lisle St., W.C.2, where callers are cordially invited to inspect our large stocks of wireless bargains. Please send all post orders to 323, Euston Rd., N.W.1.

SOUTHERN RADIO, 323, Euston Rd., London, N.W.1 (near Warren St. Tube). Phone: Museum 6324. [3754]

A.F.5C., 16/-; A.F.5, 14/-; Telsens 7-1, 5/-, 1.75-1, 5/-; S. G. Lewis, 49, Clifton Rd., Liverpool 6. [3769]

EXPERIMENTER'S New Surplus Components; sale or exchange.—Write, 31, Morris St., Swindon. [3720]

CHAL-ELECTRIC Offers New Set Manufacturers' Surplus, all carriage paid; cash with order, or c.o.d.

VARIABLE Condensers.—J.B. Nu Gang (3-gang), complete with disc drive, covers, trimmers, escutcheon, light knob, etc., 17/6; 2-gang, fitted as above, 9/6; Polar Star (3-gang 1933), complete, fitted as above, list 30/6, at 18/-; Uniknob 2-gang, fitted as above, complete, 10/-; Utility 2-gang, fitted as above, 8/6.

COILS (6 sets each only).—Colvern Ferrocort, F1, F2 and F3, ganged, 32/-; Varley Ni-core, 3-ganged, 28/-; Varley sets, B.P., 25/6 (3 sets only).

SMOOTHING Condensers.—C.E.C. Murphy, etc., 800 test 250 A.C. working, 1 mfd. 1/1, 2mfd. 1/9, 4mfd. 2/6; all the following 1,500 D.C., test 500 A.C., working 800 peak, 1 mfd. 1/9, 2 mfd. 2/4, 4 mfd. 4/-; Multiple Banksal, separate tapings, 20 mfd., 4+4+2+2+2+2+1+1 at 11/-, 11 mfd., 4+2+2+2+1, at 6/9; mains transformers and chokes, Philips tapped and screened primary L.T. windings C.T. 500-0-500 at 120 m.a., 4 volts 2.5 amps., 4 volts 2 amps., 4 volts 5 amps., 21/-; 250-0-250 at 75 m.a., 4 volts 1 amp., 4 volts 5 amps., 11/-; 250-0-250 at 60 m.a., 4 volts 1 amp., 4 volts 1 amp., 4 volts 3 amps., 12/-; chokes, 30 henry, 75 m.a. (300 ohms), 6/9; 30 henry, 60 m.a. (350 ohms), 6/6; 50 henry 60 m.a. (450 ohms), 8/9; 20 henry 120 m.a. (300 ohms), 9/6.

ASK for Special Quotation for Anything You May Need —Chal-Electric, No. 6, Conduit St., London, W.1. [3777]

SURPLUS Components of All Descriptions for Disposal, bargain prices; callers only.—Newport Surplus Stores, 24a, Newport Court, W.C.2. [3781]

**Components, etc., for Sale.—Contd.**

**METERS** Moving Coil, Weston 301, 1 m.a., 27/6; 5 m.a., 25/-; 10 m.a. and upwards, 22/6; Galvos 30-0-30, 27/6.

**NEW** British Made, 1 m.a., 27/6; 250 volts (1,000 w. per volt), 32/6; Turners 20 m.a. upwards, 17/6; thermo ammeters, 1.5a, 22/6; French 3-range, 3 m.a., 6v., 240v., 22/6; 2-range, 2 m.a., 240v., 20/-; German 2 m.a., 25/-; 2,000 volts, 32/6; assorted makers, 25 m.a. and upwards, 10/6; laboratory apparatus in stock; meter repairs a speciality.—The Victa Electrical Co., 47, High St., Battersea, S.W.11. Phone: Batt. 0780. [0355]

**B.T.H.** Amplifiers.—Small type A.C./H.L., A.C. P., and 2-A.C. P.'s in push-pull volume control, etc.; £3 each, complete with valves.

**12-WATT** Type, with 2-P.P.5/400's push-pull in output stage; £15, brand new.

**B.T.H.** Pick-up Tone Arms, 3/-; carriage paid cash with order or c.o.d. Ward, 12, Tredgar Rd., Bow, E.3. Advance 3668. [3773]

**A.F.5.** 15/-; A.F.5.C.O.P.M.6C., 26/- pair; Ferranti A.C. eliminator, 200 volts, 100 millamps, £4, nearest.—94, Mount Pleasant, Bilton. [3747]

**GILBERT INDUSTRIES** Parcels and Components.—"A," "B" and "D" parcels still available by return (see issue October 6th).

**OUR** Famous 30 m.a. 180v. A.C. Eliminator Kit, complete in every detail, has now been redesigned with a still smarter case and heavier rectifier; price remains at 30/- post paid while supplies last.

**GILBERT INDUSTRIES, Ltd.**, 519, London Rd., West-cliff, Essex. Phone: Southend 492071. "Come and see us Sunday morning." [0402]

**GALVANOMETERS**, reflecting, moving coil, Gambrell's, Onward's, Paul's, new; 50/- each; packing, postage 1/-. Beaton, Chalk Farm Rd., N.W. [3731]

**TWO** Complete Portable Talkie Outfits, made by Associated Sound Equipments, sound on film, can be seen and heard working at the below address.

**FOR** Further Particulars of the Above Equipments, also variety of pull-through and driven soundheads, first stage amplifiers, main amplifiers, P.A. amplifiers, photo cells, etc., apply for lists.

**H. FRANKS**, 42a, St. George St., Commercial Rd., London, E.1. Phone: Royal 8546. [3746]

**5 VALVE** Battery Superhet, less valves, etc., £3; Varley Q.P.P. input Q.P.P. output, 42.1 and 3.1, 16/- pair, or £3 10 lot.—Tomkins, 238, Drakefell Rd., S.E.4. [3774]

**A SCREENED** Coil.—Twin gang triple range, peaked for Fecamp; send 6/6 for sample and free blue prints to National Radio Service Co., 15-16, Alfred Place, W.C.1. [3721]

**CINEMATOGRAPH** Projectors, optical lanterns, films, slides, projection bulbs, lenses, spotlights; your inspection invited of big selection of bargains too numerous to list.

**ILLUSTRATED ENTERPRISES**, 159, Wardour St. (facing Film House), London, W.1. Phone: Gerrard 6889. [3750]

**AMATEUR** Disposing of Experimental Stock, many components for W.W. D.C. superhet, transformers and chokes; list sent on application.—Evans, Cleve House, Wells Green, Crewe. [3762]

**TELEPHONES**, magneto ringing, wall type, 12/6; table type, 15/-; portable, 15/-; and all accessories, magnetos, 4/-; microphones 1-, 2/- and 4/6; transformers, 2/6; etc.—Galpin, below.

**2-VALVE** Receiving Sets, 10/-; 3-valve amplifiers, 8/-; portable acetylene gas lamps, new, in case, 3/6; 30in. flexible shafts for 1h.p., 3/-—Galpin, below.

**MORSE** Practice Sets, 7/6; galvanometer, 5/-; buzzers, 2/-; Morse keys, 4/-; 2 mf. condensers, 1/-; sounders, 7/6; G.P.O. relays, 12/6; telegraph set, 22/6.—Galpin, below.

**CHARGING** Dynamos, for accumulator work, 100v. 20a., £7; 100v. 12a., £4/10; 50v. 30a., £5; 50v. 14a., £4/10; 40v. 6a., £2/10; 25v. 20a., £3/10, etc.; A.C. dynamos, 100v. 20a., £3; 100v. 5a., £2.—Galpin, below.

**METERS**, all large size, 0-120 volts, 15/-; 0-3v., 15/-; ammeters, 0-3a, 7/6; 0-20 amp., and upwards, 12/6; 0-400 amp., 25/-; 0 to 1/2 amp., hot wire, 4/-; also charging resistances, shunt regulators, cut outs, etc.—Galpin, below.

**A.C. Induction Motors**, for experimental work, 220v. 50 periods, single phase, size 3in. dia. by 2 1/2in. long, 4in. shaft; 7/6 each.—Galpin, below.

**GALPIN**, 31, Bonfield Rd., Lewisham, London, S.E.13. Works and Stores: 14, Loampit Hill, S.E.13. All goods guaranteed; cash with order or c.o.d.; 3 days approval from date of delivery; all letters answered. [3736]

**ONE** Watt Carbon Type Resistances, all values from 500 ohms to 1 megohm, 1/4d. each, or 1/- per dozen, plus postage; special prices for large quantities.—Box 8305, c/o The Wireless World. [3643]

**HULBERT** Has Always a Large Range of High Class Slightly Used Components and Manufacturers' Surplus in Stock; goods sent post free on approval against cash; some of this week's bargains:—

**FORMO** 3-gang Screened Coils, 13/6; Utility semi screened 3-gang condenser complete, 8/6; Polar Ideal 5M. condensers, 9/6 pair; Ferranti A.F.5, 16/-; A.F.6, 5/-; Varley D.P.6, 13/-; Pentam output transformer, second-hand, 10/6; Bulgin Transcoupler, 6/-.

**UNUSED** Motor Moving Coils, 6,500 ohms, 3-ratio transformer, humbucking coil, 13/9; Hellesens electrolytic, 450 volts working, 4 mfd., 2/3; 8 mfd., 3/3; H.M.V. 1.5 mfd. tapped condenser blocks, 600 volts working, 7/3.

**FULL** Radio Bargain List on Request.—Hulbert, 24, Pargeter Rd., Warley, Birmingham. [3768]

**PARMEKO** Transformer, A.4 Westinghouse rectifier, 230v. 9v. 2 amps.; £1/10; 3 2,000 mfd. electrolytic M.C.C. at 5/- each; R.I. L.T. choke (second-hand), 15/-; 6d. £2 10. Donald Young, South St., Corsham. [3729]

**AMPLIFIER**, Philips, 10 watt output stage, complete with 400v. power and rectifying valves, transformers, smoothing, etc., ready for use on 200-240v. A.C.; cost £12/10, except £3/12/6.—Johnson Engineering Co., 86, Great Portland St., W.1. [3726]



**NEW**  
**MAGNAVOX**  
**MODEL**

The new D.C. 152 "MAGNA" with 9-inch Cone has an outside spider giving a very free suspension. The multi-ratio transformer is of exceptional size and will suit any valve or combination of valves. The heavy field coil assembly provides:—

- (1) 50% better sensitivity, a higher acoustic output for the same input.
- (2) Elimination of undesirable resonances on account of increased magnetic damping.
- (3) Enhanced quality of reproduction due to "attack" which gives colour and character.

**FOR THE "WIRELESS WORLD" D.C. SUPERHET**

D.C. 152 "MAGNA" 5,000 ohms field coil with Universal transformer - £3.2.6  
Also available with 2,500 ohms field coil - - - - - £3.0.0

MAGNAVOX SPEAKERS. Manufactured and Sold by

**BENJAMIN**

THE BENJAMIN ELECTRIC LTD., TARIFF ROAD, TOTTENHAM

# BULGIN L.F. CHOKES

*In a Class alone.*

Registered Design No. 773746.

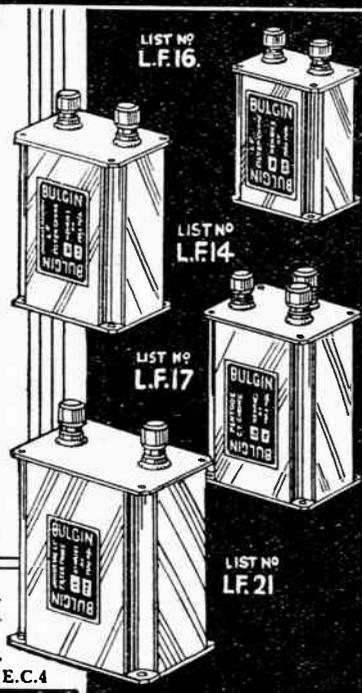
A splendid range of reliable low frequency chokes built strictly to specifications given. Finished in frosted aluminium; for chassis or baseboard mounting. Insulated terminals.

List No.	STANDARD L.F. CHOKES.	Price
L.F.16	20 h. at 20 m.a. 700 ohms approx.	7/6
L.F.20	32 h. at 15 m.a. 900 ohms approx.	7/6
POWER L.F. CHOKES.		
L.F.14	20 h. at 50 m.a. 400 ohms approx.	10/6
L.F.15	32 h. at 30 m.a. 600 ohms approx.	10/6
L.F.18	10 h. at 60 m.a. 320 ohms approx.	10/6
PENTODE CT. L.F. CHOKE.		
L.F.17	50 h. at 25 m.a. 1,000 ohms approx.	11/6
SUPER POWER L.F. CHOKE.		
L.F.21	15 h. at 100 m.a. 450 ohms approx.	15/6

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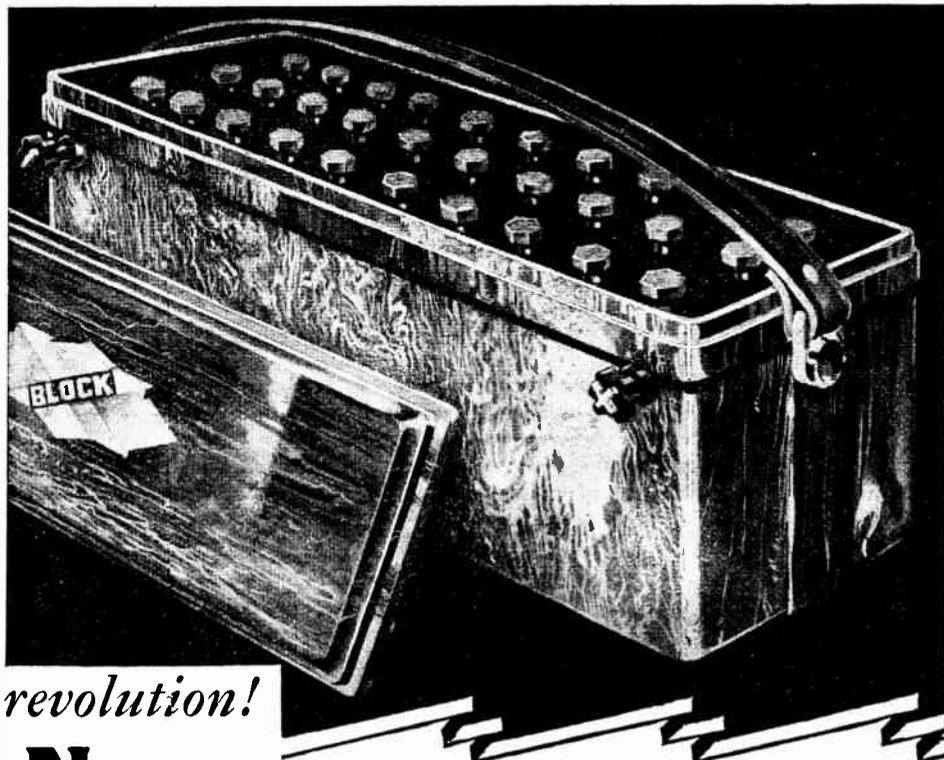
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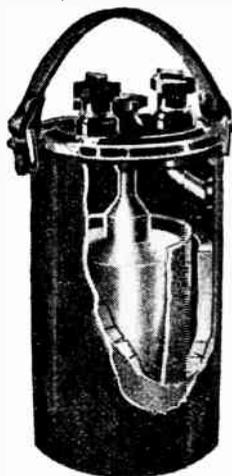


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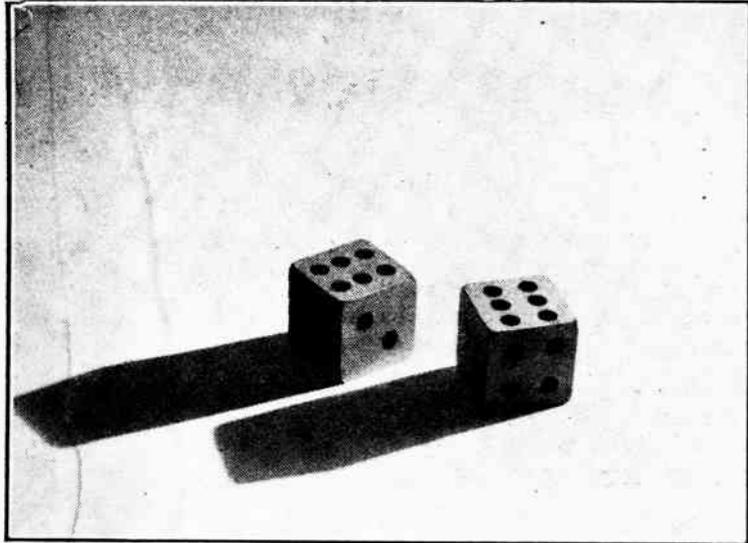
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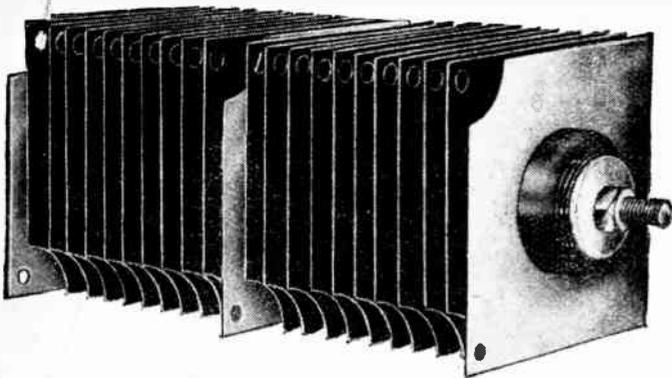
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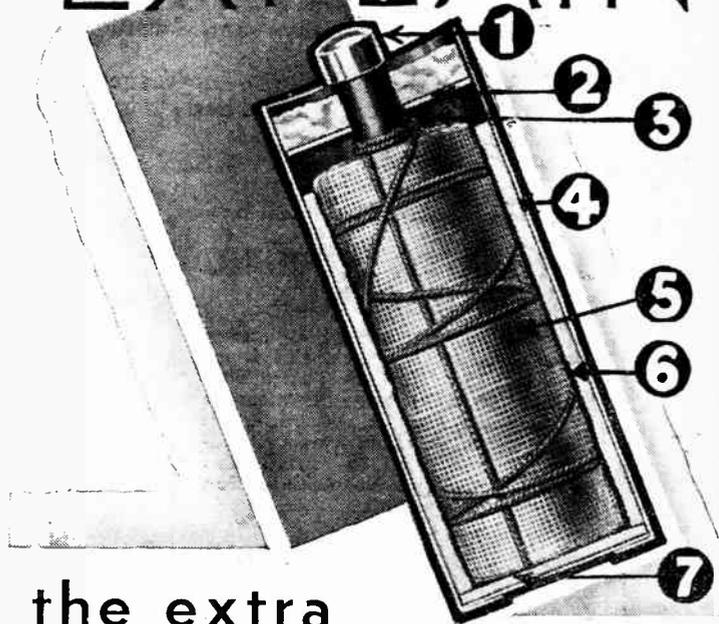


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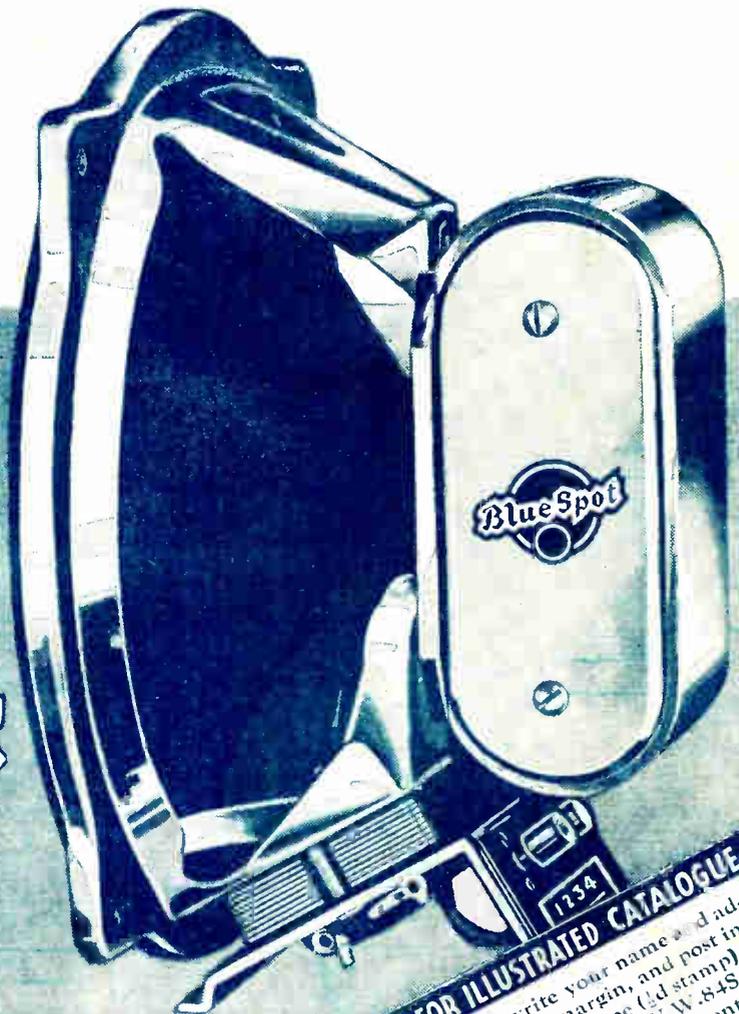
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THE PRACTICAL RADIO JOURNAL

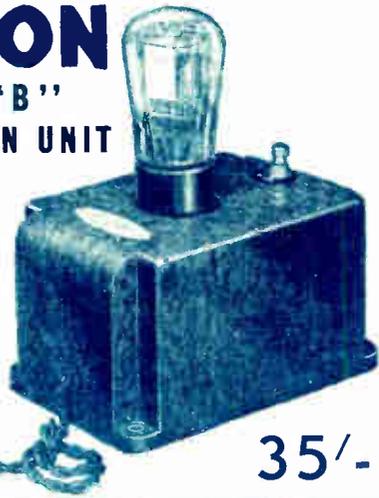
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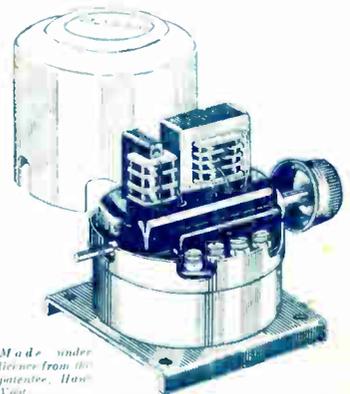
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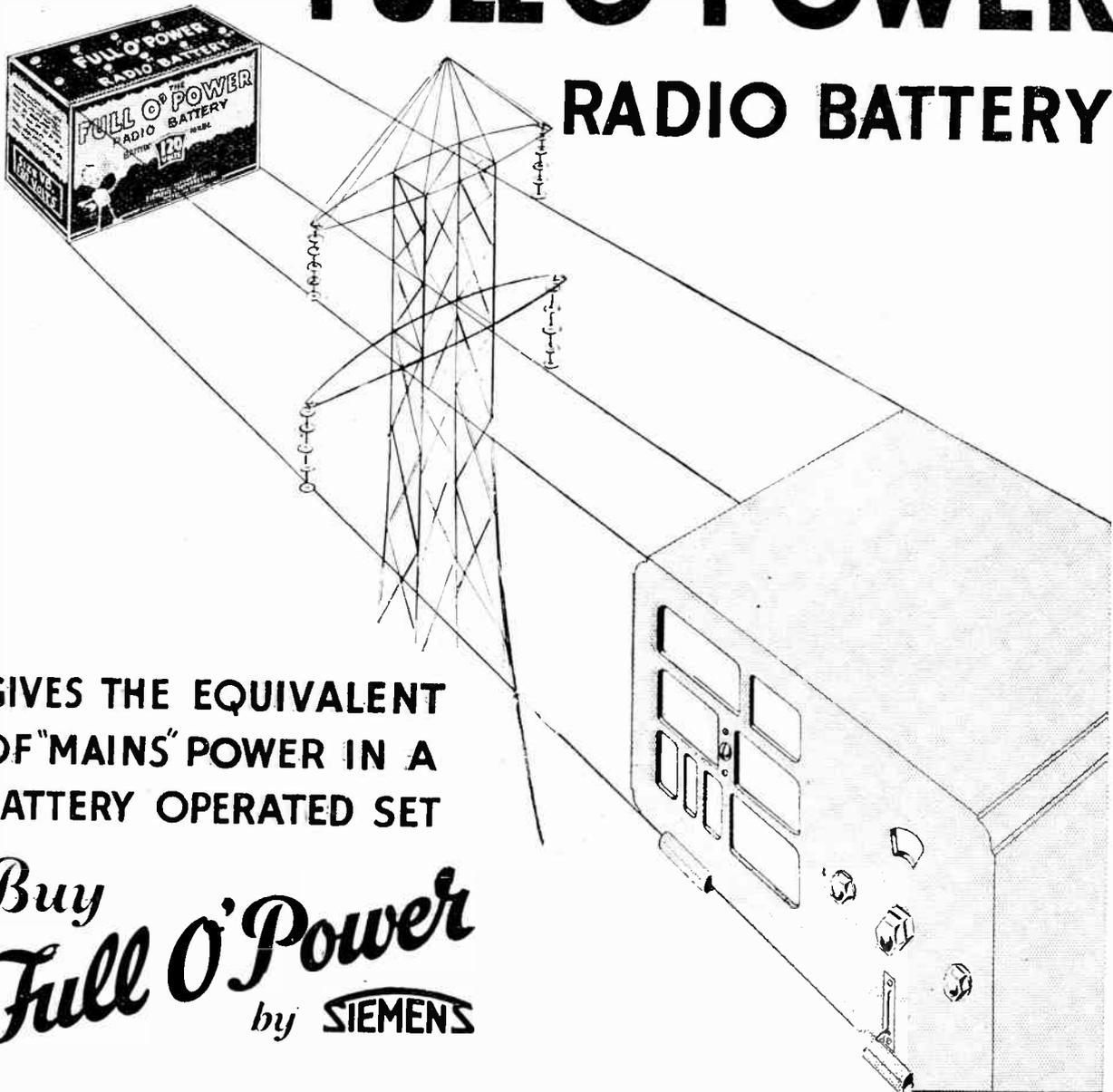
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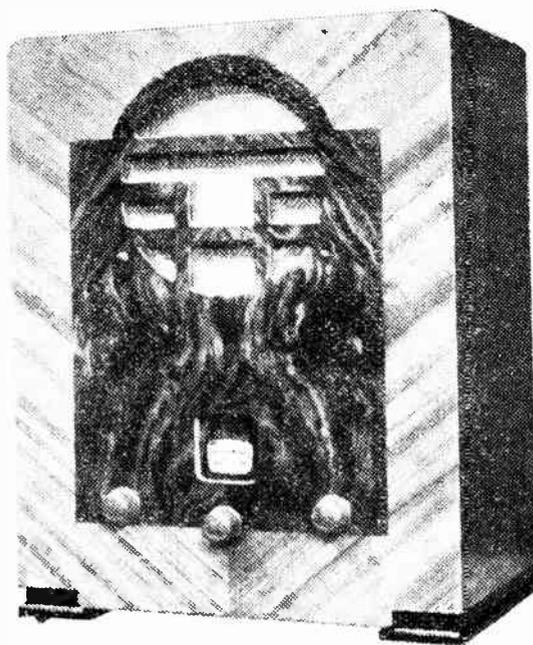
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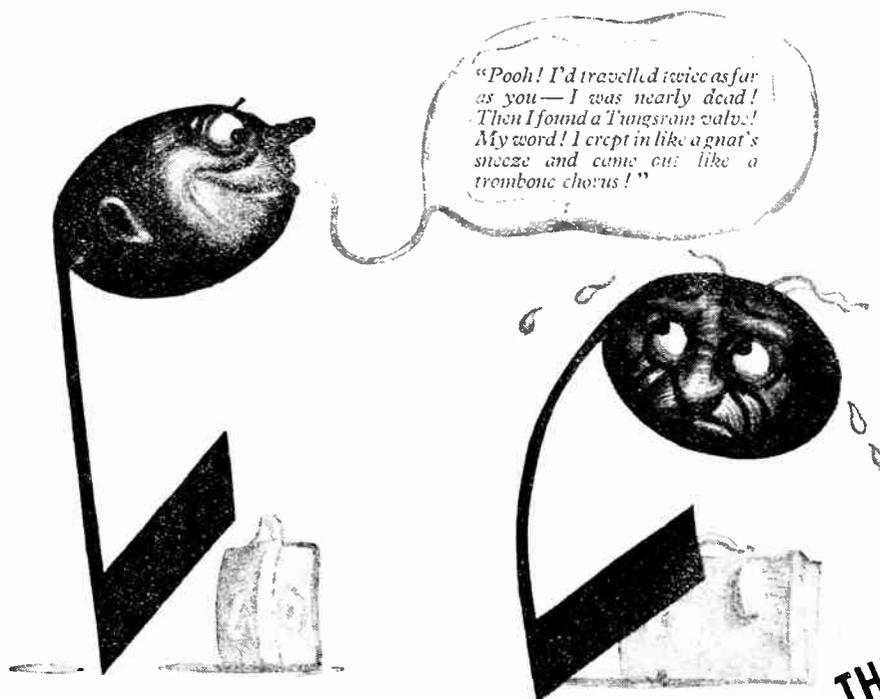
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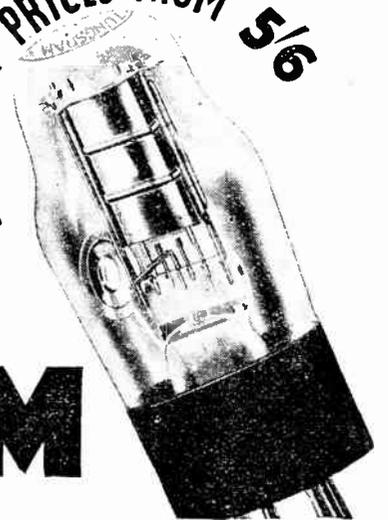
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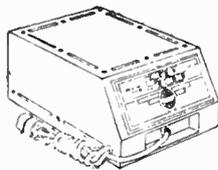
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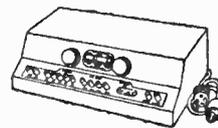


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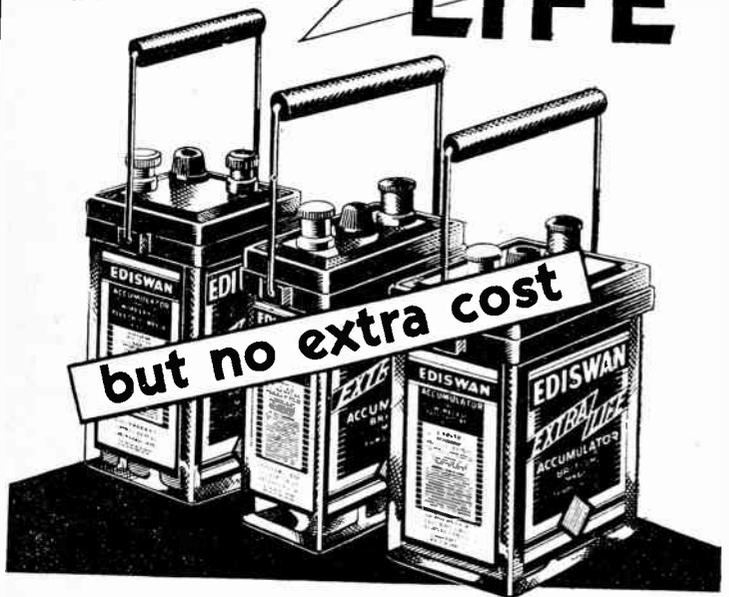
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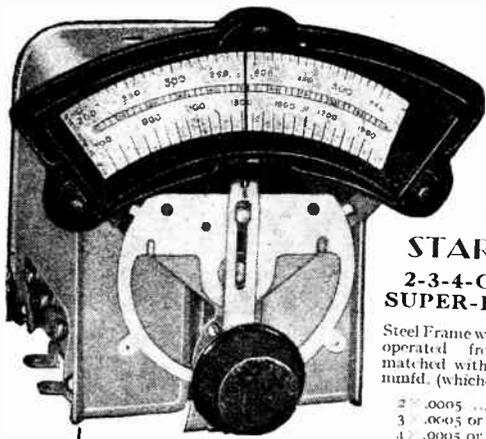
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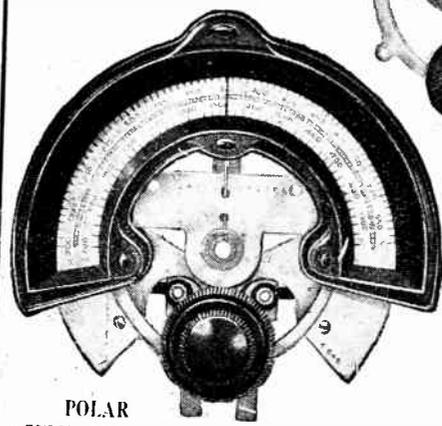
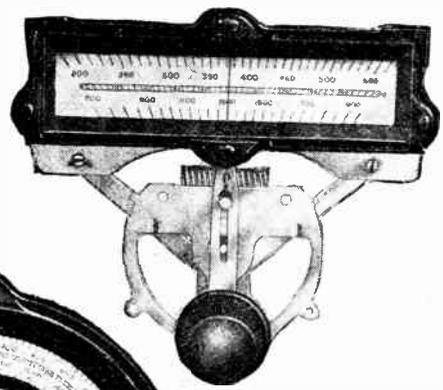
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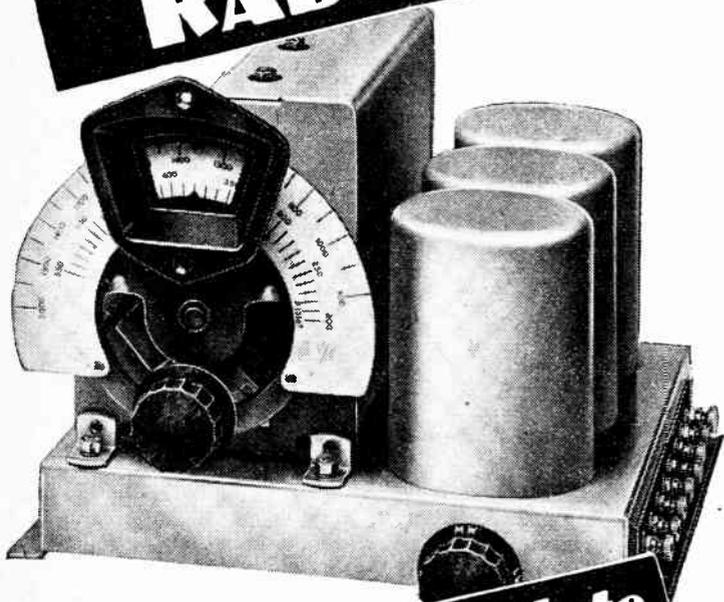
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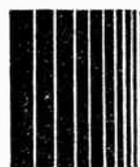


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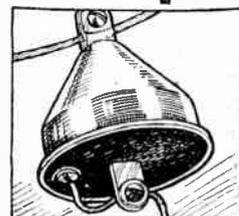
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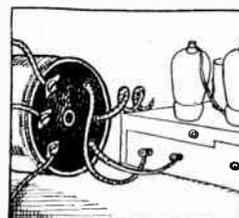
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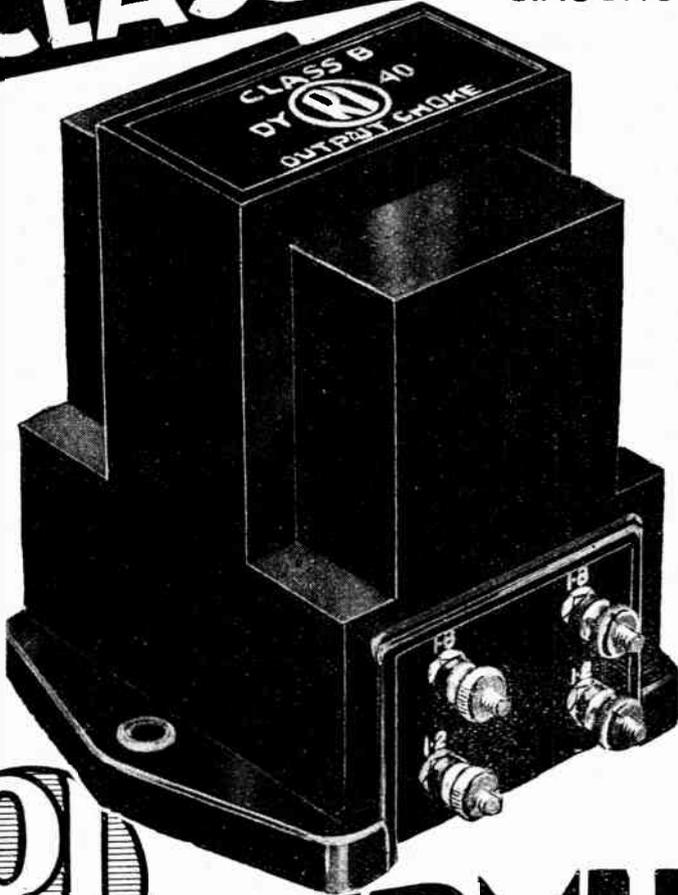
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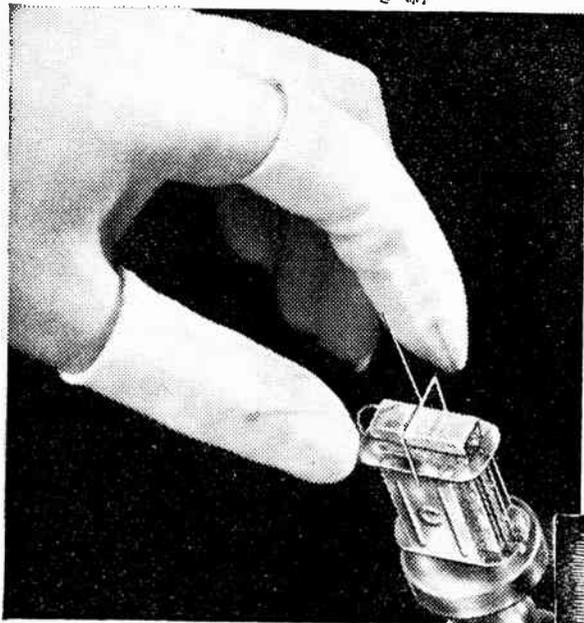
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# The Wireless World

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*As many of the circuits and apparatus described in these  
pages are covered by patents, readers are advised, before  
making use of them, to satisfy themselves that they would  
not be infringing patents.*

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## EDITORIAL COMMENT

### Electrical Interference

#### Progress Towards Suppression

**I**MPORTANT progress is being made in the crusade inaugurated by *The Wireless World* for the suppression of electrical interference with broadcast reception.

A report just issued from the Institution of Electrical Engineers advises us that the Committee on electrical interference with broadcasting, which the Institution set up some time ago as a direct result of a suggestion from *The Wireless World*, held its second meeting on Thursday, October 5th. Elsewhere in this issue we publish a report of the progress of this Committee.

It would seem that a real advance is being made not only on the general question of how to organise for the suppression of interference but also on the more detailed consideration of the technical means to be employed with specific types of electrical apparatus.

There is only one point in connection with the activities of the Institution Committee which we feel calls for criticism. In the report just issued it is stated that "The Committee reviewed various possibilities of bringing suppression devices into general use without having recourse to legislation." If by this statement it is intended to convey that the Institution Committee hopes to attain the desired result without legislation, then we feel obliged to express the view that this would be an unsatisfactory compromise not only in the interests of the broadcast listener but more especially from the point of view of the electrical industry itself. Unless legislation is introduced so as to give the Post Office the necessary authority to compel compliance with reasonable requirements, we are bound to have the unsatisfactory state of affairs resulting where individuals or certain sections of the electrical in-

dustry may be unwilling to co-operate for the suppression of interference. This would be a gross unfairness to those who voluntarily undertook, at some inconvenience and expense to themselves, to render their equipment innocuous. The purpose of legislation would surely not be to force upon the electrical industry irksome or unreasonable regulations, but to ensure that, having agreed upon fair and reasonable measures, these would be binding upon all parties on an equal footing, and without exceptions, whether the apparatus was manufactured here or imported from abroad.

#### G.P.O. Adopts "W.W." Suggestion

Another important step in connection with the interference crusade is one which has just been taken by the Post Office. For some considerable time past forms to be filled in by listeners suffering from interference have been available on application to the Post Office Engineering Department. *The Wireless World* has felt that this method of reporting was unnecessarily troublesome to the listener, and we therefore brought to the notice of the Post Office the desirability of having these forms more readily available.

In our issue of June 30th, 1933, we urged that "the Post Office should simplify matters by arranging for the distribution and collection of these forms by all head Post Offices." Now, interference forms are being made available so that any listener troubled with interference can obtain a form from his local Post Office, fill it in, and post it, the form being already addressed to the proper department. We hope that all listeners experiencing interference will make use of this form, for by so doing they will greatly facilitate the task of the Post Office in locating and suppressing interference.

# Television Explained

## I. The Principles of Scanning

*TELEVISION is fast approaching the stage when it can take its place in broadcasting as a companion to the familiar sound transmissions. It has not yet reached this stage, but the indications are that it will have become of entertainment value sooner than many realise. The present article is, therefore, the first of a series intended to give an introduction to the theory and practice of television, and to illustrate some of the problems involved.*

**T**HE transmission and reception of moving pictures, which constitutes television, is a matter fraught with many theoretical and practical difficulties, and the art is hardly more advanced than that of wireless telephony in the pre-broadcasting era. This does not mean, however, that television is in any way impossible, and, indeed, it is at the present time possible to obtain extraordinarily good results in the laboratory. The apparatus employed, however, is too expensive and complicated for general use. The point of importance is neither the expense nor the complication of the equipment but the fact that good results are possible, for there is no doubt that development will in time result in a cheapening and a simplification of the apparatus, and high-quality television will then become a commercial possibility.

It may be said, therefore, that at long last television is becoming feasible and worth while for the amateur, and is opening out an entirely new field for the experimenter. The present tendencies in television lie in the employment of ultra-short

wavelengths for transmission and the use of cathode ray tubes, at least for reception. Before the benefits conferred by these can be fully appreciated, however, it is necessary to have a full understanding of the older systems upon which the latest



(a) In making this picture a block with a normal screen has been used.



(b) In this picture a coarse screen has been employed with the result that much of the detail has been lost.



(c) Here the screen is so coarse that little resemblance to the original picture can be seen at first, but if examined from some distance the definition apparently improves.

developments are based. Let us therefore examine the requirements.

It is well known that in the cinema the picture thrown on the screen is not actually moving, but consists really of a series of still pictures, all very slightly different from one another, and succeeding one another so rapidly that the eye is deceived, and cannot distinguish them separately. Owing to the retentivity of the eye the impression produced by one picture persists for a fraction of a second, and before it has died away the next picture comes along.

It has been found that if not less than about ten pictures a second are thrown on the screen the impression of a moving picture is produced. With such a low picture frequency, however, there is a considerable amount of flicker, and it is now the standard practice in cinemas to

use about twenty-four pictures a second.

Now, in television, the same requirement holds good, and it is necessary to transmit from ten to twenty-four pictures a second. The requirements, however, are made more difficult by the fact that it is impossible to transmit even one picture instantaneously, as in the cinema. Only a minute portion of the picture can be transmitted at a time, and it is necessary to break up the picture into a large number of small pieces, transmit these one after another, and then reassemble them at the receiver. When it is remembered that the whole of this process must be carried out in from one-tenth to one-twenty-fourth of a second, some idea of the speeds involved can be gained.

### The Photo-Cell

The variations in light intensity in the picture are converted into variations of an electrical current with the aid of a photo-cell. Such a cell is analogous to a valve in that the light falling upon it varies a steady current through the cell in the same way that a change of grid voltage in a valve varies the steady anode current. Provided that the cell is correctly operated the change in output current is proportional to the change in light intensity, so that we have available a distortionless method of converting variations of light into variations of current which are electrically equivalent to an alternating current superimposed upon a direct current, just as in the output of any ordinary valve.

It will be obvious that if we focused the whole picture to be transmitted upon the photo-cell the current through the cell would change by an amount depending upon the total illumination

**Television Explained—**

of the picture, and would not depend at all upon the details of the picture. If we break the picture up into quarters, however, and let the light from each quarter fall upon the cell successively, we shall obtain a different value of photo-cell current for each quarter depending upon the total illumination of each quarter. We shall still be far from perfect, and shall obtain no intelligible picture, but the results will represent an advance on those obtained by focusing the whole picture upon the cell. Following the same argument, it will be seen that if we break the picture up into an infinite number of elements and let the light from each fall successively upon the cell, we shall obtain electrical variations of current which constitute a complete copy in the different medium of every detail of the picture.

**A Method of Scanning**

All printed pictures are made in a similar way from an extremely large number of elements, and if any half-tone illustration be examined under a magnifying glass it will be seen to consist of a large number of minute dots, and the greater the number of dots to the inch the better the picture. This is well brought out by the illustration, which shows the same picture printed with different numbers of dots to the inch, or different screens. At (a) a normal screen of about 85 dots per inch is used, whereas at (b) a much coarser screen has been employed. The picture shown at (c) is still coarser, and it is instructive to note how much detail has been lost. If the pictures be regarded from a distance, however, the differences appear far less, and the worst picture becomes intelligible.

The dot analogy is not strictly accurate in television, for the picture is normally broken up into a series of lines rather than distinct dots. The underlying principle,

however, is the same, and the differences are brought about chiefly by the methods involved. The process of breaking the picture up at the transmitter and reconstituting it at the receiver is called scanning, and in its simplest form this is carried out by means of a Nipkow disc.

upon the photo-cell. This process is illustrated in Fig. 3, in which the original picture is seen at (a); (b) shows the scanning strips into which it is divided, and (c) shows the sequence of these strips from the point of view of time. At (d) will be seen the corresponding electrical current in the photo-cell circuit, the variations of current during the interval (A) corresponding to the variations in light intensity along the strip (A) and so on.

It will be obvious that the narrower the width of the scanning strips the greater will be the picture detail, for, assuming a square hole in the disc, the smaller will be the average illumination at any given instant. In other words, the greater will be the number of elements, or, in terms of half-tone illustrations, the finer will be the screen. In the present B.B.C. transmissions by the Baird process 30 lines are used and 12½ pictures are transmitted a second. There are thus 375 lines transmitted a second.

It will be readily apparent that the breaking of the picture into such a small number of lines must lead to a poor quality image at the receiver, but

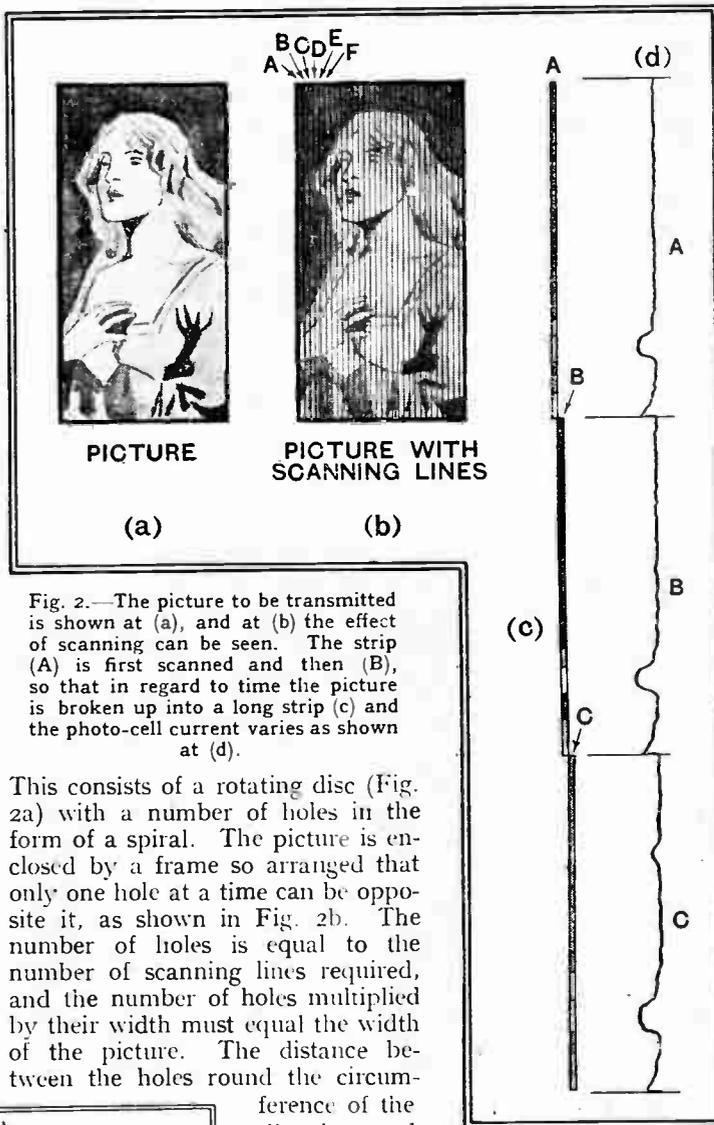


Fig. 2.—The picture to be transmitted is shown at (a), and at (b) the effect of scanning can be seen. The strip (A) is first scanned and then (B), so that in regard to time the picture is broken up into a long strip (c) and the photo-cell current varies as shown at (d).

This consists of a rotating disc (Fig. 2a) with a number of holes in the form of a spiral. The picture is enclosed by a frame so arranged that only one hole at a time can be opposite it, as shown in Fig. 2b. The number of holes is equal to the number of scanning lines required, and the number of holes multiplied by their width must equal the width of the picture. The distance between the holes round the circumference of the disc is equal to the height

of the picture. It will be seen, therefore, from Fig. 2b, that at the instant that hole (B) finishes its traverse of the picture, assuming the disc to be rotating in a clockwise direction, the hole (A) is just coming on to the picture, and will traverse a path immediately adjacent to it.

A set-up which could be used for transmitting a cinema film is shown in Fig. 2c, where the light from a lamp is directed through the film, and after being scanned by the disc falls

before considering the number of lines which is necessary for a good picture, it will be as well to examine the other details of the transmitter and receiver, and these will be dealt with in the next article.

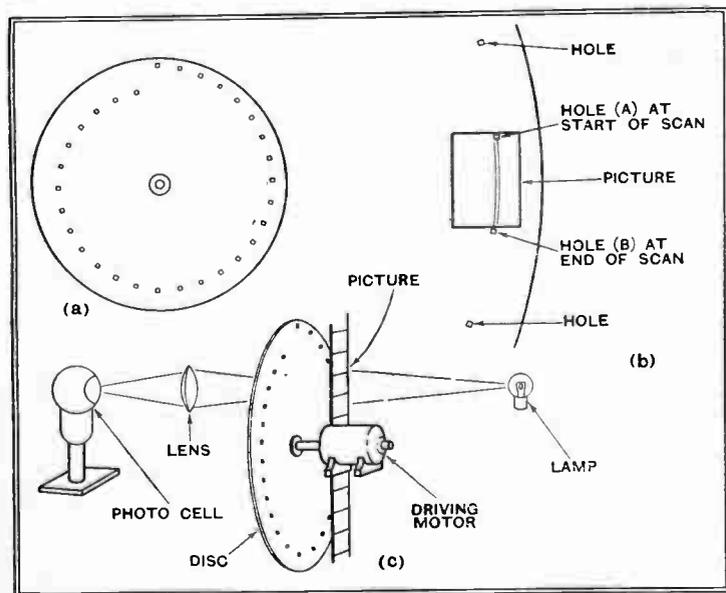


Fig. 1.—The scanning mechanism employed in simple television apparatus is shown diagrammatically. At (a) the arrangement of holes in the Nipkow disc can be seen, and (b) shows how the picture is traced by the successive holes. The complete arrangement for transmitting a picture from a cinema film is illustrated at (c).

**NEXT WEEK'S ISSUE:**

**Valve Data Booklet**

A Special Supplement giving full practical data on all types of valves. Invaluable to every serious reader.

The issue will also contain special articles on valves and their applications.

# Practical HINTS and TIPS

AMONG those engaged in the heavier branches of electrical engineering, we wireless people have the reputation of being almost criminally negligent in the matter of providing safety fuses for our apparatus. Many of the criticisms which

## Fuses for Mains Filters

have been directed against us are not altogether deserved, but in one respect at least we should take care to put our house in order. This is with regard to the fusing of by-pass condensers used in connection with anti-interference mains filters.

As most readers are aware, the purpose of these filters is to deflect H.F. currents superimposed on the mains supply from the household wiring, whence this energy is likely to be radiated (as from an aerial) and to interfere with broadcast reception. The subject has been dealt with exhaustively from time to time in these pages, and the difficulty of using choke-capacity filters has been explained. It might be added to what has already been said that, according to the Post Office engineers, most types of interference are mitigated by plain by-pass condensers, which, provided they can withstand the applied voltage, may be fitted without introducing complications.

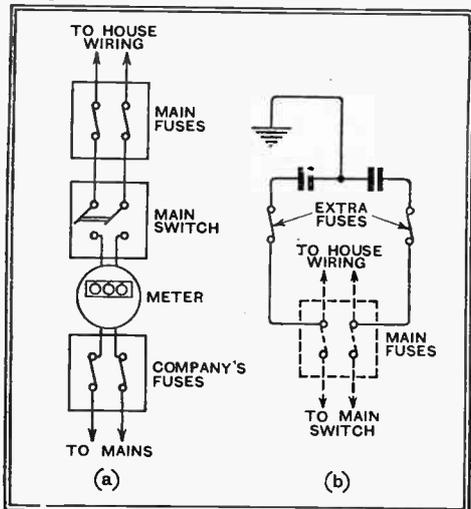


Fig. 1.—Usual method of installing a mains supply, and the safest position for an anti-interference filter.

In order that any type of mains filter may be thoroughly effective, it is essential that it should be connected as near as possible to the point of entry of the mains into the house. Those who are proposing to fit, or to instruct their electricians to fit, a filter will find it worth while to study the skeleton diagram given in Fig. 1. (a), which represents the ordinary sequence of connecting the various accessories employed in a domestic installation. The mains are led directly to the company's fuse box, which is sealed and inaccessible; next comes the meter, and then

## AIDS TO BETTER RECEPTION

the mains switch. For obvious reasons, no connection should be made to these points; anything that is added should be joined on the output side of the main fuses, which are connected to the on-off switch.

A little consideration will show that the result of a breakdown in a by-pass condenser connected either across the mains or between the "live" main and earth will be a direct short-circuit, which will blow the main fuses and put the whole house in darkness. Extra fuses of a much lighter gauge (capable of carrying, say, 1 amp.) should therefore be connected in series with the condensers, as in Fig. 1 (b), which represents the normal method of installing a plain capacity filter, and shows what is normally the correct point of attachment to the household wiring. Safety fuses are already fitted in this way in the Belling-Lee interference suppressor, which also comprises the necessary condensers, ready mounted, with terminals,

IN designing an A.V.C. superheterodyne, it is quite usual to control the first detector as well as the signal-frequency H.F. stage and the I.F. amplifier. Anode-bend detection is almost universally employed for the first detector, and so it is practicable to decrease the sensitivity of the valve by applying an excess negative bias to its grid in just the same way as when dealing with an amplifying valve.

It should be made quite clear that, with ordinary valves, this form of control is applicable only when a two-valve frequency changer is employed. With a combined detector-oscillator the application of a high negative controlling voltage to the grid will prevent the generation of oscillations unless a Heptode is used.

MOST people have found by experiment that, when a valve fails to oscillate freely as a result of tightening reaction coupling, self-oscillation can generally be brought about by increasing the applied anode voltage. The Pentagrid or

## The Pentagrid Oscillator

Heptode valve now coming into use as a combined detector-oscillator in superheterodynes, is no exception to this rule, in spite of the fact that it is a multiple-electrode valve, in which one of the grids acts, so far as its oscillator function is concerned, as an anode.

At first sight it might appear easy enough to apply a higher anode voltage, but in a mains-operated set it is seldom possible to do this directly. Similarly, it is not generally realised that the fairly obvious alternative of increasing the working anode voltage by reducing the value of feed resistance is likely to prove abortive.

The reason for this is shown diagrammatically in Fig. 2, which represents in

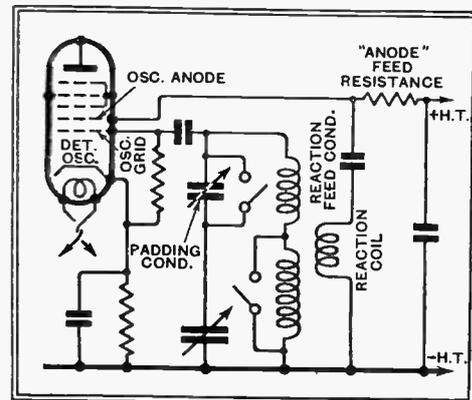


Fig. 2.—Showing that the feed resistance for the oscillator section of a Pentagrid valve is, in effect, in shunt with the reaction coil.

skeleton form the oscillator circuit of a superheterodyne using one of the new valves. The feed resistance through which voltage is applied to the oscillator "anode" is virtually in shunt with the reaction coil; any great reduction in the value of this resistance will impose a partial short-circuit across the reaction coil, and so, although the anode will be operating at a higher potential, it will generally be found no easier to obtain self-oscillation.

THEORETICALLY, the undistorted output obtainable from a pair of output valves connected in parallel should be just double that of a single valve of the same type. But in practice so great an increase is not always realised. Take the case of a D.C. receiver, where, due to a limited H.T. supply, the practice of fitting parallel valves is fairly

## Parallel Output Valves

common. The addition of a second valve may reduce the working anode voltage to a serious extent, due to the greater loss of voltage in the smoothing equipment and output transformer primary.

This is where the "D.C. Superhet" scores. In this receiver (recently described in *The Wireless World*) the total anode current consumption is unusually low for such an ambitious set, and moreover, the circuit arrangement is such that a very limited amount of smoothing is required. Consequently there is very little loss of H.T. voltage, and so exceptionally great volume is obtainable from a single output valve.

# Design for a Scratch Filter

## Constructional Details and Hints on Adjustment

IMPROVEMENTS in the manufacture of gramophone records in recent years have gone far to minimise the irritation of surface noise, and where trouble is experienced on this score it is safe to assume that a fairly considerable high-note resonance is present in the electrical pick-up.

Surface noise covers a wide band of frequencies and is thus able to stimulate the natural resonance of the pick-up at whatever frequency it may occur. It is, in fact, quite easy with a little experience to estimate the approximate frequency of the needle armature resonance from the character of the surface noise. It is for this reason that in modern pick-up designs every effort is made to reduce as far as possible the rise in output due to armature resonance, and in the majority of cases this rarely exceeds 5 db. A year or two ago it was by no means uncommon to find units with otherwise excellent characteristics producing armature resonance amounting to 10 or 15 db., and where one of these units is still in use the introduction of a scratch filter will result in a very marked reduction of background noise without appreciably affecting quality in the upper register.

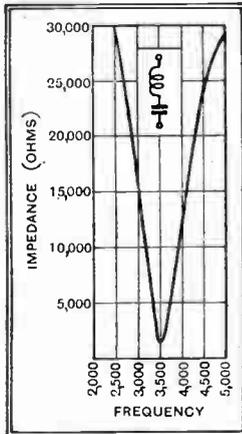


Fig. 1.—Impedance of acceptor circuit near resonance. Inductance 1.8 H., capacity 0.00117 mfd., D.C. resistance 1,050 ohms.

very little higher than the D.C. resistance of the coil, but at other points in the frequency range its impedance may easily rise to a hundred or more times this value.

In the majority of pick-ups the armature resonance lies between 2,500 and 5,000, and a suitable choke for this range is shown in cross-section in Fig. 2. The former consists of two 3in. discs cut from three-ply wood and spaced 1/2 in. apart by a 3/4 in. diameter centre boss. With 7,000 turns of No. 38 D.S.C. an inductance of 1.8 henrys is obtained for a D.C. resistance of 1,000 ohms. The tuning capacity consists of an 0.0005 mfd. variable in conjunction with two fixed mica condensers of 0.0005 and 0.001

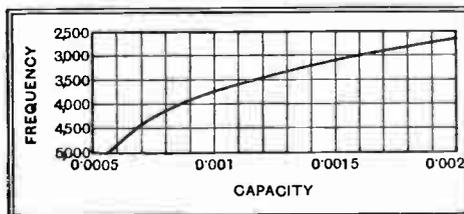


Fig. 3.—Tuning curve of acceptor circuit with an inductance of 1.8 H.

mfd. respectively. With this combination a continuously variable capacity from below 0.0005 to 0.002 is obtained, and in conjunction with the inductance already described gives the frequency range shown in Fig. 3.

The next step concerns the method of utilising the fall in impedance of the acceptor circuit to cancel the resonance peak in the output from the pick-up. Probably the best arrangement is that in which the acceptor forms the lower half of a potential divider connected across the pick-up terminals. In the circuit in Fig. 4 one half of the potential divider

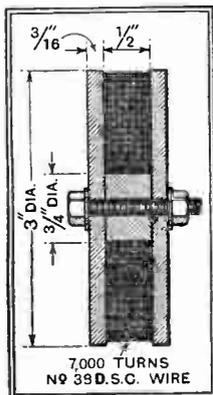
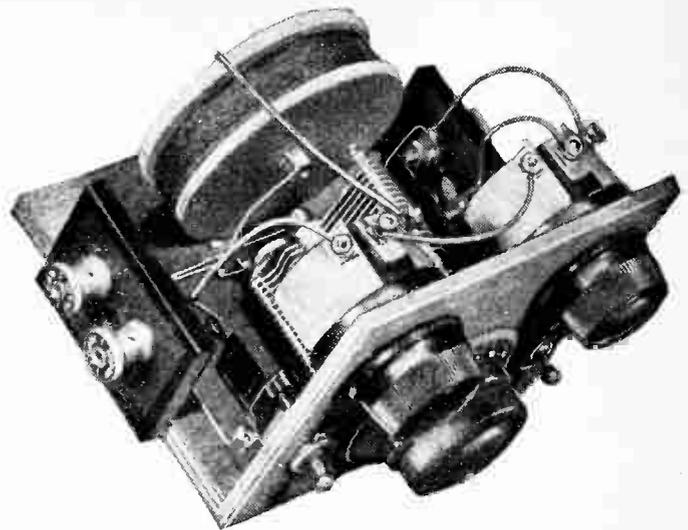


Fig. 2.—Essential dimensions of filter choke giving 1.8 henrys for a D.C. resistance of 1,000 ohms.

terminals. The characteristic of such a circuit is shown in Fig. 1, from which it will be seen that the impedance of the circuit reaches its lowest value at resonance. At this point the impedance is actually



An experimental filter unit constructed on the lines advocated in this article

consists of R1, and the other of R2 in series with the tuned circuit. In order to obtain the required degree of correction at resonance it is necessary to adjust the slider so that the ratio of the impedance of the acceptor circuit in conjunction with R2, to the resistance of R1 (and, to a certain extent, the impedance of the pick-up itself) gives the required reduction in the ratio of V2 to V1. At frequencies other than resonance the volts passed on to the amplifier will be determined by the resistance of the volume control in relation to R1 and the pick-up impedance, since the impedance of the acceptor circuit will rise considerably above 50,000 ohms. In order to increase the correction the slider is moved to increase R1 and decrease R2, but this will also have the effect of reducing the general level of the output. This is unavoidable, but fortunately the reduction of the resonance peak progresses at a greater rate than the reduction in general level, and a satisfactory correction can be made in most cases without serious loss of volume. This point is brought out in the curves of Fig 5, which are actual measurements of the output of a commercial pick-up in the region above 1,000 cycles. The ratios of R1 to R2 were as follows: In Curve I, 1 to 3; Curve II, 1 to 1; Curve III, 3 to 1. It will be seen that the latter ratio gives a slight over-correction of the peak, so that

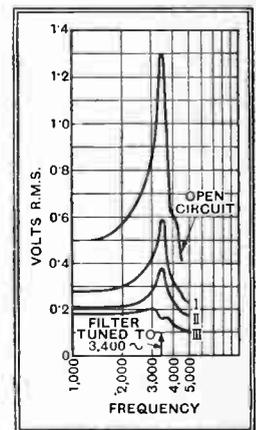


Fig. 5.—Pick-up characteristic in region of armature resonance, with and without filter. Curve III shows the effect of over-correction.

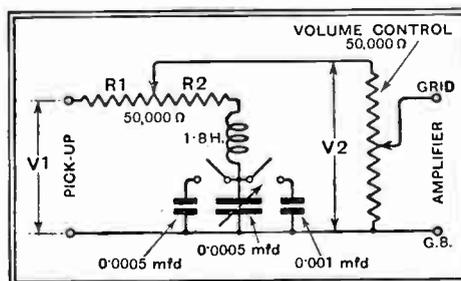


Fig. 4.—Complete circuit diagram of filter unit.

**Design for a Scratch Filter—**

the correct adjustment would have been given by a slightly higher value of R<sub>2</sub>.

The preliminary adjustments of the filter should be made with R<sub>1</sub> at maximum and R<sub>2</sub> at zero. This gives the highest possible degree of correction and enables sharper definition to be obtained when tuning out the scratch. Having found the pick-up resonance, the next step is to increase R<sub>2</sub> and reduce R<sub>1</sub> as far as possible

without reintroducing the surface noise. This will avoid an unnecessary reduction in high frequency response.

In conclusion, it should be realised that the scratch filter of necessity causes a reduction of the average output, and that in some cases an extra stage of amplification may be called for. In general, the less the degree of correction required by the pick-up, the smaller will be the reduction in general volume.

## DISTANT RECEPTION NOTES

### Spanish Mystery : Stations that Lose Power

A NEW Spanish station was opened recently at Tarragona. This is EAJ33, which is working on a wavelength of 202 metres. I have not so far picked up its transmissions, but since on certain nights stations near the bottom of the medium waveband are wont to come through with almost uncanny strength I have no doubt that it will be received before long. Several of the Spanish stations used at one time to be amongst the best received of Continentals in this country. Old hands will remember Radio Iberica, which seven or eight years ago operated with an output power of not more than two kilowatts, but was heard night after night at enormous volume on the small "straight" sets that most of us used in those far-off days.

Then Madrid Union Radio had its day. It used to be received quite as powerfully as is Toulouse nowadays. The next Spanish station to come into prominence was Barcelona EAJ13, which was so easy to find that the veriest beginner could tune it in without difficulty, despite the many control knobs that receiving sets sported at that time.

Now, even with a super-heterodyne, it is difficult to receive any of the Spanish stations at all well. I have often wondered why it is that so many stations are magnificently received when they first come into operation, and for perhaps a year or more afterwards. Then a decline sets in, and the time comes eventually when the volume obtainable from them dwindles to a mere fraction of what it originally was.

#### Shrinking Volume

Motala is a case in point. When it began operations this station was as strong by day or by night as 5XX, though the latter is only forty-five miles distant. Now, though generally receivable at loud speaker strength, it is a mere shadow of its former self.

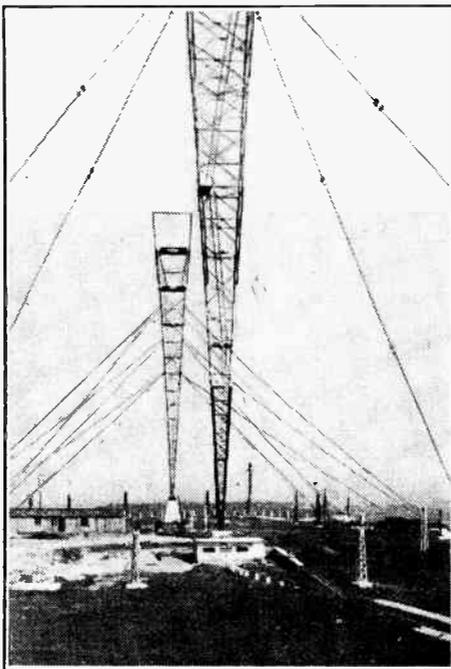
The old Vienna Rosenhügel station had a similar history; Lwow has behaved in much the same way, and other instances are to be found in Paris Ecole Supérieure, Berlin Witzleben, Lille PTT, Copenhagen, Hörby, and the old 8-kilowatt Kalundborg transmitter.

Though it was announced recently that the 60-kilowatt Munich station was closing down to enable work to go forward on the new aerial mast for the 100-kilowatt transmitter which will come into operation on January 15th, I can record quite good reception of this German station up to the evening before these notes were written. If it was the old 1.5 kilowatt plant that was responsible for the transmissions in question it is giving a very good account of itself. Munich should be a magnificent transmis-

sion after January 15th, though the new wavelength of 405.4 metres will not then be quite so favourable for long-range reception.

Reception on the long waves has not been too good of late. The reason is not that the field strength of stations is not adequate; it is that interference has been so rampant. Huizen still suffers from the attentions of Brasov, and, apparently, of a Russian station as well; Luxembourg has been badly heterodyned—apparently by Reykjavik—and Kalundborg is once more spoilt by Monte Ceneri. The long-wave stations most worthy of attention are Radio-Paris, Zeesen, and Motala.

There is also a great deal of interference



"NOT GOOD ENOUGH" has been the verdict of listeners to the new Vienna station at Bisamberg. A second mast is now being erected, as shown in this "snap," taken last week by a *Wireless World* correspondent.

on the medium waveband. Hilversum has occasionally been interfered with by a heterodyne which appears to be due to a harmonic of Luxembourg. Beromünster and Bari have also been sufferers from heterodynes.

Nevertheless, there are plenty of stations to be found quite clear of interference. The best at the present time are Budapest, Prague, Langenberg, Rome, Stockholm, Toulouse, Midi, Leipzig, Strasbourg, Brussels No. 2, Poste Parisien, Breslau, Göteborg, Heilsberg, Frankfurt, Trieste, and Nürnberg.

D. EXER.

## CLUB NEWS

### New Session

From all quarters we learn of the resumption of club meetings, and indications are that the 1933-34 session will be as busy and profitable as any in the history of the amateur radio movement.

One reason for this promising state of affairs is the ease with which the average wireless club can be organised and run to-day. Although it is not true to say that a club will run itself, every club secretary can now profit by the experience of other clubs throughout the last ten years, as reflected in the club reports published in *The Wireless World*.

### Newcastle

The Newcastle-upon-Tyne Radio Society has arranged an attractive programme of lectures, demonstrations and visits to works during the coming session. All communications should be addressed to the Hon. Secretary, Mr. William W. Pope, 9, Kimberley Gardens, Jesmond, Newcastle.

### Birmingham

Members of the Slade Radio (Birmingham) Society enjoyed a lecture on the "Cathode Ray Oscillograph and its Application to Radio Circuits," given by Mr. G. Parr, of the Edison Swan Electric Co., Ltd., recently. Various wave forms were demonstrated and could be seen quite clearly.

Hon. Secretary, 110, Hillaries Road, Gravelly Hill, Birmingham.

### London, W.

The Radio, Physical and Television Society, thanks to the facilities accorded by Dr. C. G. Lemon, now has the use of 42- and 5-metre transmitters, together with various types of electrical apparatus, X-rays, etc. Television demonstrations are to be given by the President, Major Oates. The headquarters are at 72a, North End Road, West Kensington, London, W.14, and full particulars regarding the Society can be obtained from the Hon. Secretary, Mr. F. J. Bubeare, 67, Nassau Road, Barnes, S.W.13.

### Exeter

West of England amateurs are well catered for by the programme of the Exeter and District Wireless Society during the coming months, which will include lectures on short-wave work, modern radio practice, choosing a loud speaker, besides visits to places of interest.

Full particulars are obtainable from the Programme Secretary, Mr. E. H. Ware, "The Beeches," Woodbury, Exeter.

### Croydon

The Croydon Radio Society can now accommodate fifty people at its meetings at the new headquarters, St. Peter's Hall, Ledbury Road, South Croydon. Full particulars regarding the new session can be obtained from the Hon. Secretary, Mr. E. L. Cumbers, 14, Campden Road, South Croydon.

### Kettering

The Kettering Radio and Physical Society recently held a successful radio exhibition at which nearly 10,000 people paid for admission, the contingents coming from as far afield as Wellingborough and Bedford.

Full particulars of the coming session can be obtained from the Hon. Secretary, Mr. R. J. Pankhurst (G5YF), 9, Shakespeare Road, Kettering.

### North Middlesex

The new Hon. Secretary of the North Middlesex Radio Society is Mr. J. G. Turner, 3, The Ridgeway, Old Southgate, N.14, to whom all enquiries should be addressed.

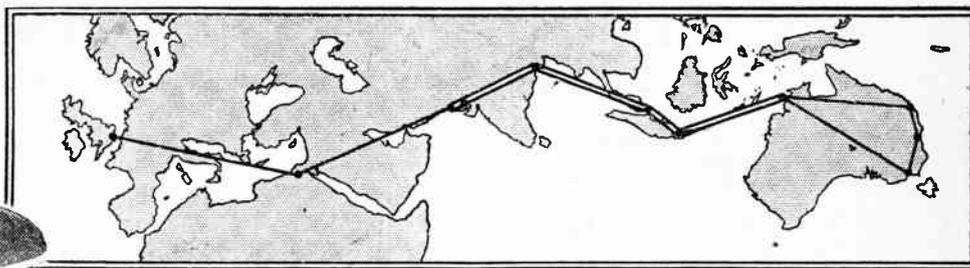
### Cambridge University

The new Hon. Secretary of the Cambridge University Wireless Society is Mr. J. Forster Cepper (Gonville and Caius College, Cambridge).

# By Air to the Antipodes

## Radio Survey that Broke Records

By W. J. E. BROWN,  
Marconi Operator



The flight covered half the world. On the left is an "Atalanta" class plane of the type used on the survey.

FOR the survey of the proposed England-Australia air route recently completed by Major H. G. Brackley, D.S.O., D.S.C., Air Superintendent of Imperial Airways, Limited, the choice of one of the "Atalanta" class aeroplanes—"Astraea" (G-ABTL)—was particularly appropriate from the wireless standpoint, because all the new fleet of eight "Atalantas" operated by Imperial Airways, Limited, are equipped with the latest type of Marconi aircraft equipment.

"Astraea" flew from the Air Port of London, Croydon, to Melbourne, Australia, and back to India, a distance of more than 23,000 miles, and, in Major Brackley's own words, "everything went like clockwork."

In addition to enabling us to defeat the heavy atmospherics encountered in the monsoon areas our combined medium and short-wave equipment achieved some interesting long-range ground-and-air communications (two-way), although our object was not to concentrate on distant communication, but rather to keep in constant touch with the ground through a series of stations in each territory covered by the flight.

The waveranges adopted as a result of extensive practical tests carried out over the African air route are 40-80 metres and 500-1,000 metres.

The transmitter is provided with the independent drive method of frequency control, the valves used comprising two magnifier valves connected in parallel, one independent drive and one modulator.

The receiver employs one screen grid high-frequency amplifier, one detector with adjustable reaction coupling, and one low-frequency magnifier.

Power for the anode and filament circuits of both transmitter and receiver valves, and also for aircraft lighting purposes, is derived from a generator fitted with a constant speed windmill and developing 200 milliamperes at 1,200 volts, and 15 amperes at 16 volts, for the high- and low-tension supplies respectively.

The Marconi-equipped "Atalanta" aircraft are also fitted with a wireless navigational aid in the form of the Marconi-Robinson directional receiving equipment.

The Marconi-Robinson system of direction finding provides what is essentially a "homing" device to enable the pilot to set his course on a known ground station. While the aircraft is on its correct course no signal will be heard from the direction finder when it is brought into operation with a special three-way switch in its central position. The alteration of the course will cause signals to be received, and by turning the switch

first to one side and then to the other and listening to the relative strengths of the signal an indication is immediately obtained as to whether the aircraft is to starboard or port of its true course. The

correction in course can then be made until the strength of signals is unchanged, whether the switch be to the left or right, and the accuracy of the course so determined can be checked by putting the switch to the central position when, if the course is correct, no signal will be heard.

The first section of the flight, from Croydon to Karachi, followed the normal air route. The usual good service was obtained from Croydon, Le Bourget, Dijon, and Lyons, on 900 metres, the

international aircraft waveband, and, on leaving Lyons, information regarding the weather and upper winds off Genoa and Pisa were obtained direct from Genoa.

After passing Antibes good two-way communication, both speech and telegraphy, was established with

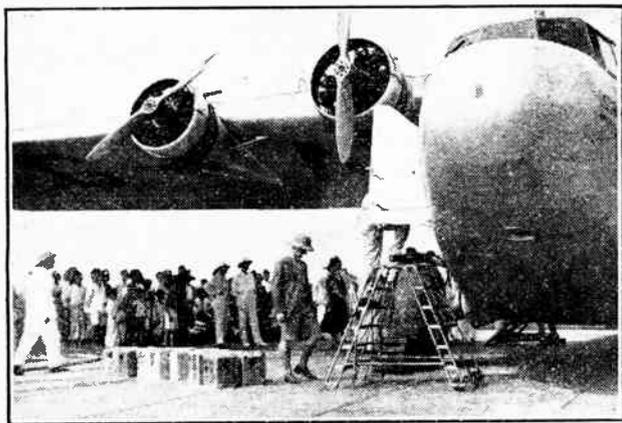
Croydon on 45.5 metres, and it seemed but a little later that, between Brindisi and Athens, Cairo was worked on the same wavelength.

Regular communication with the ground was maintained throughout the Cairo-Karachi section of the flight, working on both medium and short waves with the stations at Cairo, Gaza, Rutbah Wells, Baghdad, Sharjah and Gwadir.

### New Use for "Homing" Device

After leaving Karachi we had departed from the regular Imperial Airways routes, and between that station and Calcutta a good deal of direction-finding work and weather information was required. Calcutta also has a Marconi-Adcock direction-finding station, and several very good bearings were obtained from this station and checked with our own "homing" equipment.

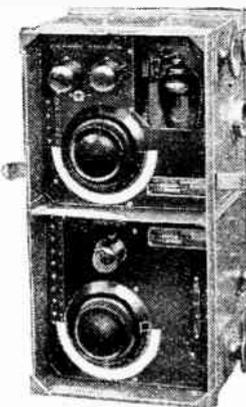
There was an incident of exceptional interest between Akyab and Rangoon, when communication was established with a homeward-bound Dutch machine belonging to the K.L.M. organisation. The Dutchman's course was checked with our "homing" device and was found to



The "Astraea" photographed while refuelling at Batavia on the homeward journey.

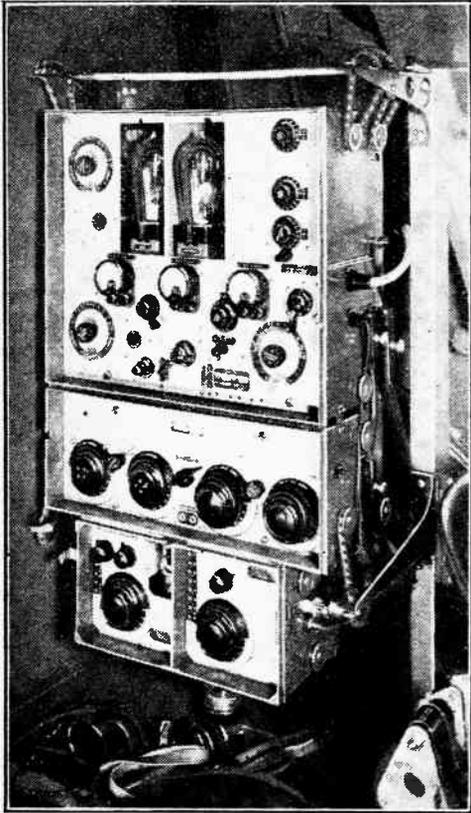
The wireless transmitter and receiver installed in "Astraea," as in all the "Atalanta" class aircraft, for Imperial Airways, Limited, is known as the Marconi Type A.D.37A/38A equipment.

The amplifier and three-way switch of the Marconi "homing" equipment.



**By Air to the Antipodes—**

be approximately the same as our own. I therefore asked at what height he was flying, and we altered our own height accordingly. It seems that this might be a very useful application of the "homing" device when flying in bad visibility and in the vicinity of other aircraft.



The "Astraea's" Type A.D.37a '38a Marconi equipment. On top is the transmitter and below it the receiver. The smaller instrument box contains the "homing" device.

The first communication with Darwin (North Australia) was made just after leaving Sourabaya (Java), G-ABTL transmitting on 45.5 metres and Darwin answering on 40 metres.

Crossing the Timor Sea (between Java and Australia) short-wave schedules had to be abandoned, as I was kept busy on 600-metre working with ships; we also had good service from Darwin on this waveband, from whom particulars of the landing-ground on Bathurst Island were received. After landing on Bathurst Island an hourly watch was kept with Darwin on 600 metres, there being no regular channel of communication between the island and the mainland, and a large number of messages was sent and received.

**On the Return Flight**

The final "hop" between Sydney and Melbourne covers an area well known for poor reception, due to the mineral properties and screening of the Blue Mountains. No undue difficulty was, however, experienced by "Astraea," and although the maximum range with Sydney on 600 metres was only about 200 miles, Adelaide came in very well on the same wavelength.

The flight back across Australia was un-

eventful, Darwin and Sydney being held practically all the way until arriving at Darwin. For the Timor Sea crossing we "homed" on Koepang (600 metres). Leaving Koepang, Batavia "PMH" was heard sending high-speed traffic on about 44 metres. Suddenly, "PMH" began calling "G-ABTL," and we had excellent communication.

Singapore "GEO" was worked on short waves soon after leaving Sourabaya.

On the flight from Singapore we kept in touch with "GEO" and also Penang on short waves, atmospherics being very bad on long waves.

Atmospherics were extremely bad from Calcutta to Karachi, and the value of short-wave working in these circumstances was exemplified by good reception of a number of short-wave stations, including Berlin and Moscow.

Within a short time we were again at Karachi, and back on the regular air route, feeling that we were indeed Empire pioneers.

**BOOKS RECEIVED**

**The Yorkshire Radio Book**, by Leslie W. A. Baily, including the history of Broadcasting in the North from 1923 to 1933. Interesting notes concerning Northern stations, studios, and programmes of the personnel connected with them, a list of Yorkshire amateur transmitters and sundry useful data. Pp. 84, with numerous illustrations. Published by the Yorkshire Conservative Newspaper Co., Ltd., Change Court, Albion Street, Leeds. Price 6d.

**Hints and Kinks for the Radio Amateur**.—Compiled by the American Radio Relay League, Inc., West Hartford, Conn., and comprising many useful hints for use in the

**FOREIGN BROADCAST GUIDE****BRESLAU**

(Germany).

Geographical position: 51° 5' N.; 17° E.

Approximate air line from London: 745 miles.

Wavelength: 325 m. Frequency: 923 kc's.  
Power: 60 kW.

Standard time: Central European (one hour ahead of G.M.T.).

**Standard Daily Transmissions**

05.00 G.M.T., physical exercises from Berlin (except Sundays); 08.00 approx. (Sun.), sacred concert; 10.30, weather and news; 11.00, concert; 15.00-16.30, light concert (talk in interval); 19.00, news, followed by main evening programme; 21.15, time signal, weather and news; 21.30-23.00 (except Mondays), dance music.

Announcer: Man.

Call: *Achtung! Hier Schlesischer Rundfunk Breslau und Gleiwitz.*

Interval signal: Metronome (200 beats per minute) and/or opening bars of *Hofenriedberger March*, as under:



Closes down with good-night greetings, followed by *Deutschland Ueber Alles* and/or the *Nazi Horst Wessel* marching song.

Relay: Gleiwitz, 253 metres (1,184 kc's.) 5 kW.

workshop, constructing receivers and transmitters, microphones, remote control, interference elimination, power supply, aerials, earths, etc. Pp. 80, with numerous illustrations and diagrams. Copies can be obtained in Great Britain from Mr. F. T. Carter, Flat A, Glencastle Mansions, Streatham, for 2s. 9d., post free.

**Les Récepteurs Radiophoniques Modernes à la portée de tous**, by Franck Duroquier, giving constructional details of various receivers ranging from a simple crystal set to a six-valve superhet and a five-valve all-range set, with chapters on the upkeep, adjustment, and testing of these receivers. Pp. 101 + viii, with 138 diagrams and illustrations. Published by Masson et Cie, Paris. Price 24 francs.

**Electrical Interference****Questionnaire Now Available at Post Offices**

*If you suffer from electrical interference you will now be able to obtain an interference form from your local Post Office. "The Wireless World" recommended this simplification of the former procedure of having to apply, in writing, to the Engineering Department of the Post Office or through the intermediary of the B.B.C.*

*The wording of the form is as follows:—*

**I**F interference is experienced when stations of the British Broadcasting Corporation are being received and it has been ascertained that the receiving set is in no way faulty, this form should be completed and forwarded by post.

The interference will be investigated and particulars of the necessary suppression apparatus will be furnished without charge. The costs subsequently involved in the permanent installation of suppression apparatus cannot be borne by the Post Office.

1. Are you using a valve set or a crystal set? If valve, state number of H.F. and L.F.
2. Does your receiver draw any part of its H.T. or L.T. supply from the electric light mains?
3. Has your set or aerial, etc., been altered in any way prior to the commencement of the interference? (Please give particulars.)
4. (a) Are your neighbours simultaneously suffering the same interference as yourself?  
(b) Is the proportion of interference to music the same in neighbours' receivers as in your own?  
(c) To which British Broadcasting Station do you listen most frequently?  
(d) Is this Station affected by the interference?  
(e) Is the Daventry Long Wave Station (5XX) affected?
5. Do you know, and can you give the address of, any local listener who hears the interference at a greater strength (in proportion to the broadcast transmission) than yourself?
6. (a) Does the interference cease when you disconnect (1) your aerial, (2) your earth, or (3) both? (Please ensure that your set is not oscillating when the aerial or earth is removed.)  
(b) Have you examined your aerial and earth wires and connections for frayed strands or bad joints?
7. State periods when interference is most pronounced.
8. If you are not a new listener, has the interference suddenly commenced?
9. Can you give date when interference first noticed?

# Post Office Research

## A Tour Round the New Experimental Station

**T**O provide facilities for the investigation of technical problems, which yearly increase in number, considerable extensions have recently been made to the Post Office Research Station at Dollis Hill, London, N.W. The new buildings, which were officially opened last Monday by the Prime Minister, are not, of course, devoted exclusively to radio, but a great deal of extra space has been allotted to that important section.

There are no secrets at Dollis Hill. As members of a Department of State devoted to public service, the engineers in charge—as keen and well-informed a body of men as any in the country—were willing to discuss freely all the aspects of their work, and to describe everything that was going forward during our visit.

One envies the Post Office its new screened room for testing high-gain receivers and for other work where the introduction of disturbing potentials from extraneous sources is likely to lead to inaccuracies. This laboratory is completely lined with steel plates  $\frac{1}{2}$  in. thick, all joints being welded together; air is admitted through "baffled" ducts, and even these can be closed up. The steel door has a double seal, and in order that the room may be isolated from the

fier for modulation, while it is interesting to note that the corresponding receiver operates on the super-regenerative principle, with a separate generator for the quenching frequency.

Another interesting short-wave receiver of the "double superheterodyne" type, with triple detection, is being built for the Portishead station, which communicates with shipping. Directional reception is carried out, and as soon as the bearing

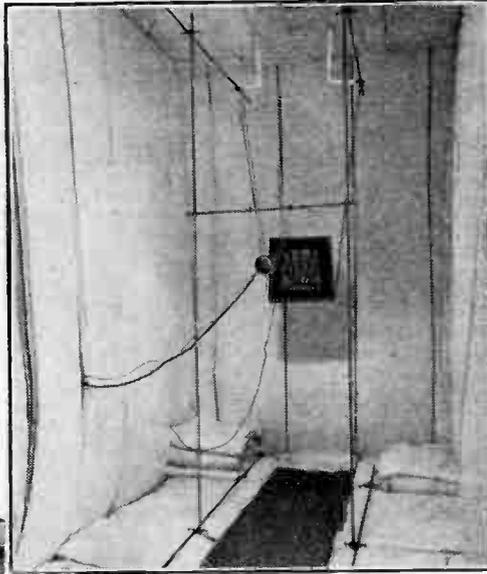


"To strive, to seek, to find."

of the communicating ship has been ascertained, a corresponding adjustment of the transmitting beam is made from the receiver panel.

In the acoustic laboratory, apparatus is installed for taking the frequency characteristics of loud speakers and microphones. There is also an "artificial ear" employed mainly for rapid testing of telephone receivers, which imposes the same acoustic load on the diaphragm as does the human ear.

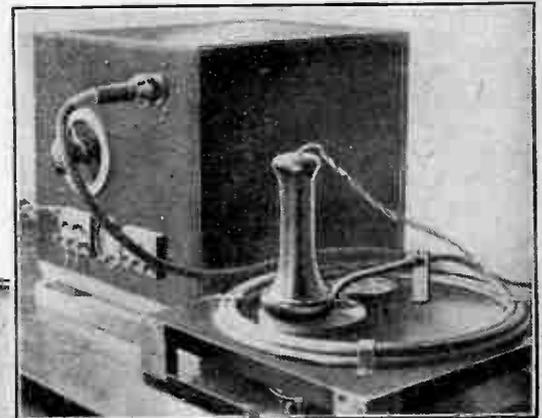
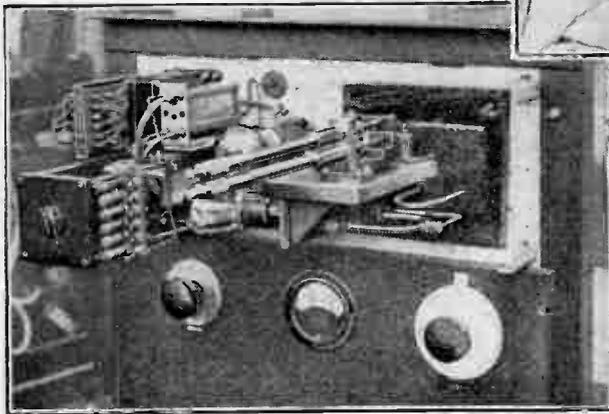
All aspects of low-frequency amplification which affect the Post Office can be investigated. A particularly interesting constant-volume L.F. amplifier has lately been developed; this piece of



(Above). The non-reverberant chamber for loud speaker tests is padded to a thickness of 18 ins.

(Left). A super-regenerative receiver for ultra-short waves.

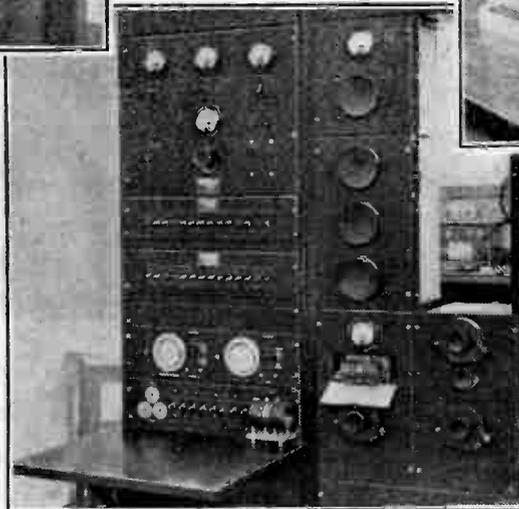
(Right). The "artificial ear" used in making graphical records of telephone characteristics.



mains a local lighting battery is installed.

Frequency measurements and standardisation, both at H.F. and L.F., are naturally of considerable importance. The main laboratory where this work is carried out derives its primary standard frequency from a valve-maintained 1,000-cycle tuning fork running at a constant temperature in a subterranean chamber; the accuracy is of the order of three parts in ten millions.

Short and ultra-short waves are occupying much of the attention of the staff. For the use of a radio link as a supplement to the land lines, new transmitters and receivers operating at between 4 and 6 metres are in course of development. The transmitter employs a Class "B" ampli-



The latest "double-beat" short-wave superheterodyne for communication with ships.

apparatus embodies what may be described as A.V.C., as the output remains sensibly constant in spite of input variations up to 40 decibels.

The laboratory which works on the elimination of electrical interference with broadcast reception is well equipped with the appliances which cause this interference—motors, flashing signs, vacuum cleaners, etc.—in order that experiments can be conducted on strictly practical lines. The design of "stopper" coils for tramways is being studied intensively.

# NEWS of the WEEK

## Current Events in Brief Review



[Photo: "Q.S.T."]

**MORSE QUEEN.** Jean Hudson, the nine-year-old who has won the world's championship, Class "E," at Chicago, by transmitting code at 20 words per minute.

### Radio Conscious

"BROADCASTING DAY" is to be celebrated in Germany towards the end of November.

### A Radio Curfew

TENANCY agreements for new workmen's flats at Seedley Road, Salford, stipulate that wireless sets must be switched off at 11 p.m.

### Budapest's Interval Signal

UNTIL the new Budapest transmitter is ready, the Hungarian Radio Company will not alter the present interval signal, which consists of a nine-note melody produced by a musical box.

### Crystal Users in Austria

NEARLY 17 per cent. of Austrian listeners still use crystal sets. The total number of registered licence holders is about 48,000. The Austrian Government has declined to increase the amount of the licence fee by 25 per cent. at the request of the broadcasting organisation, "Ravag."

### A Spanish Duel

A BITTER duel is in progress between Barcelona Radio, EAJ1, and Radio Association of Catalonia, EAJ15, over the question of recognition as the official transmitting station for the new Catalan Regional Government. According to a correspondent, the situation is complicated by the fact that the Lucerne Plan assigns to Barcelona, capital of the region, only one exclusive wavelength, namely, 274 metres. The only other available wavelength will be the common wave of 207 metres, already used by some fifteen small stations in Spain. The indications are that Radio Barcelona EAJ1 will win the battle for this exclusive wavelength and the honour of representing the Government,

### Rumours Denied

SINCE the Amsterdam Conference there have been persistent rumours of the forthcoming dissolution of the Union Internationale de Radiodiffusion. We have been asked to state that such rumours are entirely without foundation.

### Running Commentaries on Films

AN interesting novelty is featuring in the programmes at Radio-Toulouse in the shape of the broadcasting of sound films. The films are run through the projector in the ordinary manner so that listeners hear the speech and music as at the cinema; simultaneously an observer gives a running commentary on what he sees on the screen.

### Broadcasting Insect Notes

HIGH notes which confound the best of loud speakers are the medium of conversation in the insect world—a thought which has prompted Professor Larsen, of Oslo, to devise a special microphone which will make insect noises audible to human ears. A correspondent suggests that the Professor might invent a direction finder to locate and destroy a certain exceedingly elusive species.

### U.S. Broadcasting Dilemma

A DILEMMA faces the American Federal Radio Commission. The Government has now granted ten new channels between 1,500 and 1,600 kc./s to the Commission, and it is assumed that these are available for broadcasting purposes. Consequently the Commission has been bombarded with requests for these wavelengths from various stations in the U.S. The Commission feels, however, that the best policy, in order to avoid interference from stations

### I.E.E. Wireless Section

AT a meeting of the Wireless Section of the Institution of Electrical Engineers at 6 p.m. on Wednesday next, November 1st, Mr. G. Shearing, O.B.E., B.Sc., will give an inaugural address as Chairman of the section.

### "Music from the Air"

ON Thursday next, November 2nd, Mr. Martin Taubmann will demonstrate the "Electronde" at a meeting of the Golders Green and Hendon Radio and Scientific Society at the Hampstead Public Library. The meeting will open at 8.15 p.m., when Mr. H. J. Barton Chapple, Wh.Sch., B.Sc., will give an introductory address. Readers of *The Wireless World* will be welcomed.

### German Post Office and Television

INTERESTING plans for television are discussed in an official statement of the German Post Office. At a conference held on October 16th, between the German Ministry of Posts and the Broadcasting and Television Authorities, it was stated that research is now to be concentrated on 180-line images with the retention of the present number of frames per second, namely, twenty-five. The existing high-power ultra short wave transmitter at Berlin is to be adapted to the new system and the work should be completed within two or three months. In the meantime the television industry will produce a number of suitable new television receivers.

The second ultra short-wave transmitter is to be used for the transmission of sound as well as vision, and this will be completed by April next, when the transmission of sound films will be tried.

The German Post Office ex-

### Bouquet from U.S.A.

AN indirect compliment is sometimes more satisfying than the most outspoken praise. We have reserved a special place in our scrap-book for the following graceful tribute from a correspondent of our contemporary, *Radio News*, New York: "I wish to express my appreciation of *Radio News*, which I have now taken for six months. While I consider *The Wireless World* is the best weekly from the point of view of an English book, there is no monthly magazine on the market that in any way approaches *Radio News* for value."

### New Musical Instruments

A MICROPHONE class has been opened at the Paris Ecole Supérieure de Musique under the direction of M. Eric Sarnette.

An interesting by-product of recent tests at the School has been the invention of several new musical instruments which are stated to be specially suitable for the microphone.

It is surprising that inventors have not given more attention to the development of instruments favourable to modern electrical transmission. It has yet to be proved that the musical instruments now generally in use are the last word so far as broadcasting is concerned.

### Wireless League Handbook

WHAT the Wireless League is and what it does is brightly set forth in the newly published handbook of the Wireless League, issued from the headquarters, 12, Grosvenor Crescent, London, S.W.1, price 6d. In addition to articles by the Hon. Sir Arthur Stanley and Captain Ian Fraser, M.P., the booklet includes some useful "don'ts" for the wireless user, hints on fault finding, and information on wireless law.

### Interference to Order

SPECIALLY manufactured static is now applied to radio chassis on test at the Marconiphone factory at Hayes, Middlesex. For obvious reasons, the electric power mains at Hayes are steady and accurate, but it has been realised that a chassis which has been up to standard on works test might be very noisy on bad mains. So a certain section of the mains circuit, which has been isolated, is fed with interference of a particularly obnoxious kind from a 700-cycle oscillator with a heavy second harmonic. The engineers consider that this oscillator gives conditions equal to the worst kind of mains ever likely to be encountered.

### "The Wireless World"

#### A.V.C. Three

IN the table of Voltages and Currents for this receiver which appeared in *The Wireless World* for October 20th, 1933, the output valve was given as type Pen 4VA instead of AC Pen; the figures, of course, are correct for the latter valve.



MIDNIGHT OIL was burned to secure for H. L. O'Heffernan (G5BY) this medallion issued in the recent International Relay Competition to entrants who were first in their respective countries. G5BY obtained 10,860 points and topped the British list for the fifth consecutive time.



in Mexico and Canada, will be to make a free gift of this frequency band to one or other of these countries.

If this course should be followed, American stations may allege unfair treatment, and the Commission is faced with an unpleasant dilemma. If in this case charity begins at home, interference may make itself felt from abroad.

plains that it is anxious to develop television so that it may become an integral part of the broadcasting programmes as soon as possible. Germany, it is explained, must retain the "advantage which it has at present gained in television technique over developments in other countries."

# FOREIGN PROGRAMME SUPPLEMENT



## BARCELONA

**EAD1**; 860 kc/s, 348.8 metres; 8 kW.—11.0 a.m., Chimes from the Cathedral, and Weather. 1.0 p.m., Gramophone Music. In the interval at 1.30, Theatre Notes. 2.0, Sextet Concert. 3.0, Programme for Hospitals and other Benevolent Institutions, with Gramophone Records. 4.0 to 5.30 Interval. 5.30, Agricultural Notes and Gramophone Music. 6.0, Concert by the Radio Orchestra. 6.30, Song Recital by Julià Ortega (Baritone). 7.0, Grieg Concert by the Station Orchestra and Concepció Callao (Songs). 8.0, Dance Music, relayed from Hollywood Bar. 9.0, Extracts from Musical Comedies, on Gramophone Records. 10.45, Chess Lesson. 11.0 (approx.), Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—9.0 a.m., See Rome. 9.30, Agricultural Report. 10.0 to 11.0, See Turin. 11.30, See Rome. 11.45 to 1.0 p.m., See Turin. 1.0 p.m. till Close Down, See Rome.

**BASLE**.—See Schweizerischer Landessender.

## BERLIN

**DEUTSCHLANDSENDER (Reichssender)**, 183.5 kc/s, 1,635 metres; 60 kW.—10.30 a.m., See Leipzig. 11.0, Wind Instrument Concert conducted by Gohlke. 11.55, Time Signal. 12 (Noon), Concert (contd.). 1.0, Recital of Children's Songs. 1.30, Talk: The Young Generation and Socialism. 2.30, Sacred Concert relayed from St. Mary's Church. 3.30, Talk on Hunting. 3.45, Talk. 4.0, Gustav Kolne reads from his own works. 4.20, Recital of Loewe Ballads by Franz Sauer (Bass), followed by Gramophone Records. 5.0, Talk on Amateur Photography. 5.15, In the Country—Concert by a Peasant Band, with Zither and Mandoline Music. In the intervals, Talks by three of Brinsdorf's oldest inhabitants. 6.0, Programme for the Thirty-Sixth Birthday of Dr. Goebbels. 7.0, Concert by the Augmented Station Orchestra, conducted by Paul Scheimpflug. Soloist: Enrico Mainardi (Cello). 8.0, Report of the Relay Races in the Sportplatz. 8.15, Concert (contd.). 9.5, News. 9.45, Weather. 10.0, Programme from Langenberg. 11.0 (approx.), Close Down.

## BERLIN

**FUNKSTUNDE**, 716 kc/s, 419 metres; 1.5 kW.—10.30 a.m., See Leipzig. 11.0 to 1.0 p.m., See Heilsberg. 1.30, Red Riding Hood—A Play for Children from a Tale by Grimm. 2.15, Talk: Berlin Curiosities. 2.30, Topical Talk. 3.0, Concert of Light Music, conducted by Kurt Budde. 5.0, Humorous Talk. 5.30, Chamber Music. 6.0, Classic Examples of German Eloquence: Dr. Johannes Günther and Heckleys at the Microphone. 6.30, Radio Report of a Trial Performance by the Berlin Philharmonic Orchestra, conducted by Wilhelm Furtwängler, with Commentary. 6.50, Sports Notes. 7.0, Lottery Announcements. 7.5, Concert of Light Music by the Station Orchestra, conducted by Schlemm. 9.0, News. 9.15 (approx.). Dance Music. In the interval from 10.0 to 10.10, Topical Talk. 12 Midnight, Close Down.

**BERNE**.—See Schweizerischer Landessender.

**BEROMUNSTER**.—See Schweizerischer Landessender.

**BODEN**.—See Stockholm.

**BODO**.—See Oslo.

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—9.0 a.m., The Opening of the Radio Exhibition, relayed from the Agricultural Museum. Addresses and Music. 9.30, Festival Programme relayed from Moravská-Ostrava. 10.30, See Prague. 12.55, Hydrographical Report. 1.0, Interval. 1.50, See Prague. 4.30 to 5.30, Pro-

gramme relayed from Brezno. 4.30, Talk on Brezno. 4.45, Talk. 5.15, Music by a Children's Choir. 5.30, Folk Lore Programme relayed from Bravacov. 6.0, See Prague. 6.5, See Brno. 6.50, See Moravská-Ostrava. 7.40, See Prague. 7.45, Talk: The Turkish National Festival. 8.0, Concert by the Station Orchestra, conducted by Dyk. 9.0, See Prague. 10.0 (approx.), Close Down.

**BREMEN**.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—10.0 a.m., Vocal and Instrumental Concert by Young People, relayed from the Konzerthaus. 12 Noon, Humour on Gramophone Records. 1.40 p.m., Talk. 1.55, Chess Lesson. 2.10, Reading. 2.30, Programme for Children. 2.30, Concert conducted by Walter Mundry. In the interval from 3.45 to 4.15, Reading from the Works of Max Heinzel on the Centenary of the Poet's Birth. 5.0, Reading from Michael (Goebbels) on the occasion of Dr. Goebbels' Birthday. 5.20, Talk, with Gramophone Record Illustrations: Silesian Army Officers in the Days of Frederick the Great. 6.0, Talk: The Radio Reporter. 6.30, Weather and Topical Talk. 7.15, See Munich. 8.0, News. 8.10, Concert by the Silesian Philharmonic Orchestra, conducted by Topitz. 9.30, Time and News. 10.0, Programme from Langenberg. 11.0 (approx.), Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—6.5 p.m., Slovak Songs of the Turkish Wars. 6.50, See Moravská-Ostrava. 7.40, See Prague. 7.45, See Bratislava. 8.0, See Prague. 10.0 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R.; 590 kc/s, 509 metres; 15 kW.—9.45 a.m., Announcements. 10.0, Gramophone Concert. 10.50, Radio Report of the Procession of Ex-Servicemen before the King on the nineteenth anniversary of the Battle of the Yser. 11.15 (approx.), Concert by the Small Station Orchestra, conducted by Leemans. 12 Noon, Concert by the Radio Orchestra, conducted by Walpot. Soloists: Morel (Tenor) and Platel (Baritone). 1.0 p.m., Le Journal Parlé. 1.10, Concert, relayed from the Grand Hotel, Antwerp: Valse militaire belge (Frémaux); Au bon vieux temps (Mouton). 1.30, Two Sketches, on Gramophone Records: (a) Jean de la lune, and (b) Les Vignes du Seigneur. 1.40, Concert (contd.): Fantasia (Stolz); Potpourri of Tangos and Foxtrots (Meisel-Stolzenwald). 5.0, Orchestral Concert, relayed from the Piazza. 5.30, Football Results. 6.0, Programme for the Tenth Anniversary of the Turkish Republic. Address by the Turkish Ambassador in Brussels. Gramophone Music. 6.30, Gramophone Records. 7.15, Religious Address. 7.30, Talk and Music Review. 8.0, Concert by the Radio Orchestra, conducted by Walpot. Soloist: René Durand (Tenor). 8.45, Théodore cherches des allumettes—Faree (Courteline). 9.0, Concert of the Station Symphony Orchestra, conducted by Arthur Meulemans. Soloist: Yvonne Gall (Songs). 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—10.0 a.m., Concert by the Small Station Orchestra, conducted by

Leemans. Soloist: Michot (Violin). 11.0, Gramophone Music. 12 Noon, Orchestral Concert, conducted by Fellenman, relayed from the Grand Hotel, Antwerp. Soloist: Carl Frank (Song Refrains). 1.0 p.m., Journal Parlé. 1.10, Concert by the Station Orchestra, conducted by Walpot. Soloists: Morel (Tenor) and Platel (Baritone). 5.0, Concert by the Station Symphony Orchestra, conducted by Meulemans. Soloist: Stoefs (Flute). 5.30 (approx.), Sports Results. 6.0, Gramophone Concert. 6.30, Concert by the Small Station Orchestra, conducted by Leemans. 7.15, Religious Address. 7.30, Journal Parlé. 7.55, See Brussels No. 1. 8.0, Song and Piano-forte Recital by Sabine Katter and Armand Doufour, relayed from the Conservatoire. 8.45, Recitations. 9.0, Concert by the Station Orchestra, conducted by Walpot. Soloist: Clément Doucet (Piano-forte). 10.0, Journal Parlé.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 5.30 p.m. till Close Down.—8.15 a.m., News. 9.0, Catholic Service. 10.15, Divine Service, followed by Orchestral Concert, conducted by Fridl. Soloist: Ivan Engel (Piano-forte). 1.0 p.m., Gramophone Concert. 2.0, Agricultural Talk. 2.45, Rural Programme. 3.30, Broadcast for Schools. 4.0, Concert by the Simi Kurina Cigány Band. 5.0, Talk. 5.30, Dramatic Programme. 6.25, Sports Notes. 6.35, Count Klebelsberg Memorial Programme, by the Municipal Choir and Orchestra, conducted by Dohnányi. An Address, followed by Mass in C Minor (Mozart). 8.50, News. 9.15, Turkish Programme. 10.0, Military Band Concert.

**CASSEL**.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—7.0 a.m. Gymnastics for Women. 7.15, Gymnastics. 8.0 to 8.30, Talk. 9.0, Divine Service from the Cathedral. 10.30, Weather and News. 11.0, Town Hall Chimes. 11.1, Concert by Louis Prell's Instrumental Ensemble. 12.30 p.m., Talk in English. 12.50, Talk in German: Modern Hamburg and Cologne. 1.10, Talk in French, The Origin of the Marseillaise. 1.30, Gramophone Music. 1.55, Programme for Children. 2.25, Symphony Concert from the State Broadcasting Building. The Radio Symphony Orchestra, conducted by Launy Gröndahl. Soloists: Holger Brydning and Einar Nörby. 4.0, (Also on Skamleback, 31.51 metres). Divine Service Relay. 5.20, Talk. 5.50, Weather and News. 6.15, Time Signal. 6.30, Talk: Modern American Literature. 7.0, Town Hall Chimes. 7.2, The Hansel Family—Humorous Episode (Jens Locher). 7.15, Saint-Saëns Concert by the Radio Orchestra, conducted by Emil Reesen. 8.15, Guitar Recital. 8.55, News. 9.5, Gramophone Records from Cavalcade (Noel Coward). 9.15, Reading. 9.35, Piano-forte Duets. 10.0, Dance Music from the Ritz Restaurant. In the interval at 11.0, Town Hall Chimes. 11.30 (approx.), Close Down.

**CORK**.—See Athlone.

**DANZIG**.—See Heilsberg.

**DRESDEN**.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12.30 p.m., Programme in English by the I.B.C. 11.0, Happy Hour. Part I: Orchestral Music. Signature Tune. Selection from The Quaker Girl (Monckton); Artists' Life (Strauss); Dance of the Nymphs (Borch); Violin Solo: An Old Viennese Dance (Voglein); Stephanie Gavotte (Czibulka); Fluttering Birds (Gennin); Around the Volga (Borchert); Gridiron Club March (Souza). Part II: Request Half Hour of Sacred and Organ Music. On Wings of Song (Mendelssohn); Ave Maria (Schubert); The Sanctuary of the Heart (Kettelbey); Priere a Notre Dame (Boulli); Cornet Solo: The Lost Chord (Sullivan); Largo (Händel); Berceuse, from Jocelyn (Hordard); Cathedral Chimes (Lindahl); Signature Tune. 12 Noon, The Mysteriole Broadcast. Diddle, iddle, iddle da day; Put on your Old Grey Bonnet (Weinrich); I'm falling in love with someone Smile for me; Selection from Love me To-night; What a Wonderful way to start the Day; Sweethearts forever; Cecilia; Song of Songs (Moya); Candian Capers; You'll get by; Selection from Sally. 12.30 p.m., French Programme. 2.30 to 7.30, Programme in English by the I.B.C. 2.30, Orchestral Concert. Selection from The Chocolate Soldier (O. Strauss); Love and Life in Vienna (Renard); Song: Poor Man's Garden (Russett); Selection from Give me a Ring (Broones); The Busy Bee (Bendix); The Song of the Tramp (Sievier); A Girl like Nina (Hammerstein); Selection from No, No, Nanette (Youmans). 3.0, Light Music. By the Swanee River (Myddleton); Fairy Tale (Heykens); Waltz, Morella (Cuvellier); Rosa Mia (Guizar); Pan and the Wood Godfins (Rathke); Perdita (Cuvellier); Wienerblut (Strauss); Dwarf's Patrol (Rathke). 3.20, Military Music. Tipperary (Williams); Valse des alouettes (Drigo); Old Palama (Alford); A Hunting Scene (Bucalossi); In a Persian Market (Kettelbey); Hobomoko (Reeves); Jolly Fellows (Vollstedt); March Past of the Brigade. 4.0, Jugg Rutherford's Address. 4.15, Nursery Corner. 5.0, A Musical Tour. Once on the Rhine (Ostermann); Spanish Serenade (Herbert); Chinese Serenade (Herbert); Carnival of Venice (Briccialdi); Memories of Paris (Moretti); Paliko Blues (Traditional); Vienna, Vienna (Foss); Russian Rhapsody (Nussbaum); Cuban Serenade (Herbert); Oriental Serenade (Herbert). 5.30, I.B.C. Members' Request Programme. Blaze Away (Holzmann); The Meynell Hunt (Cotton); Lily of Laguna (Stuart); The Old spinning Wheel (Hill). 5.45, Concert. My Lady Deainty (Hesse); In Tulip Time beside the Water Mill (Niel); Violin Solo: The Song of Songs (Moya); Barcarolle (Waldtenfel). 6.0, Orchestral Concert. Searf Dance (Chaminade); Meditation from Thais (Massenet); Liebestraume (Liszt); Idylle bretonne (Gennin); Walther's Song from The Mastersingers (Wagner); Scherzo from A Midsummer Night's Dream (Mendelssohn); Intermezzo from Cavalleria Rusticana (Mascagni); Waltz from The Sleeping Beauty (Tchaikovsky). 6.30, Variety Programme. (Electrical Transcriptions). The Mills Brothers: Git Along (Austin); Stanley Holloway: The Lion and Albert; Grace Fields: There's a Cabin in the Pines; Layton and Johnston: Goodnight but not Goodbye; The Boswell Sisters: Shuffle off to Buffalo (Dubin); George Robey: A Little Idea of my Own; Bing Crosby: Learn to Croon (Coslow); Ambrose: All over Italy (Munroe). 7.0, Choral Music. Orchestra Singing a Song to the Stars (Meyer); Veterans of Variety; Song of the Jolly Roger (Candish); Caller on (Gray); Orchestra: Selection from The Count of Luxembourg (Lehar); Comrades in Arms (Adams); Ould John Braddlem (Traditional); Orchestra: Love sends a Little Gift of Roses (Openshaw). 8.0, French Programme. 9.0 till Close Down, Programme in English by the I.B.C. 9.0, Concert of Dance Music. Signa-

OCT. 29th **SUNDAY** continued

**HURE TUNE:** Happy Feet; Isn't this a Night for Love; Ding, Dong, Ding; Don't Blame Me; I've found the Right Girl; A Girl like Nina; Happy as the day is long; My Moonlight Madonna; Louisville Lady; Signature Tune: Happy Feet. 9.30. Tunes from the Talkies. "Smilin' Through" (Penn); Selection from Waltz Time (Strauss); What a Perfect Combination (Kahmar); Selection from The Gold Diggers of 1933 (Dubin); My Bluebird's Singing the Blues (Robin); In a Year, in a Day (Haymann); You're an old Smoothie (Whiting); Selection from A nous la liberte (Auric). 10.0. Gramophone Music. Cornflowers and Poppies (Walteufel); Beautiful (Gillespie); Since you went away (Johnson); Pianoforte Solo: Dancing Butterfly (Young); Valeta Medley (Varney); The Organ Grinder (Step); Pianoforte Solo: Selection from He Wanted Adventure (Waller); Wood Violets (Fétras). 10.30. Concert of Dance Music. Under a Blanket of Blue; Lay your Head on my Shoulder; Goodnight, little girl of my Dreams; My Mother's Garden; Snowball; Mademoiselle; My Kingdom for a Smile from you; I bring a Song; With you here and me here, 11.0. Broadcast of Dance Music. Signature Tune: Happy days are here again; Love Songs of the Nile (Brown); Let's call it a Day; Egypt; I'll take an option on you; Lover's Lane; Whistling under the Moon; Forever; Let's make it up; Signature Tune: Happy days are here again. 11.30. Concert by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Signature Tune: Come back to Erin; Salut d'amour (Elgar); Song: Mother Machree (Ball); The Way to the Heart (Lincke); The Blue Bird (Bordin); Marching through Georgia (Work); Song: Ellen Alannah (Thomas); The Old Folks at Home (Foster); Romance (Lohr). 12.5 a.m. **Monday**, I.B.C. News Bulletin in English. 12.10 (approx.). Club Concert for Preston and Blackburn Listeners: Signature Tune: The Chum Song; I wake up smiling (Ahlert); Someone to care for; Sylvia (Sollner); Won't you stay to Tea (Revel); Contented (Turk); It pays to advertise (O'Hogan); That's my home (Rene); I sigh for you Rio Rita (Adam); London Bridge is falling down (Bleyer); I've told every little Star (Hammerstein); We belong together (Kern); The Song is you (Kern); I wake up smiling (Ahlert); Signature Tune. 1.0. Dance Music: Signature Tune: Bells of Normandy; My Darling; You've got me crying again; Piccinny; Two Buck Tim; They all do the Rumba; I can't remember; Maria my own; Moon Song; Rockabye; Castles in the Sand; Old Man Harlem; You are too beautiful; Here is my Heart; In the Park in Patee; Dance Pretty Lady; H's the Band; Signature Tune. 2.0. I.B.C. Good-night Melody and Close Down.

**FLENSBURG.**—See Hamburg.

**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—10.30 a.m., See Leipzig. 11.0 to 12.15 p.m., See Stuttgart. 12.15. Gramophone Records of Popular Orchestras. Songs in the interval. 12.55. Talks arranged by the Wiesbaden Board of Agriculture. 1.5. Rural Programme—Dialogue. 1.30. See Stuttgart. 2.30. Radio Report of the Upper Hessian Festival in Grünberg. 3.0. See Langenberg. 5.0. Radio Report from Idar-Oberstein. 5.30. A Merry Interlude. 6.0. Sports Notes. 6.10. Tales by Henry Beuirth. 6.40. Topical Talk. 7.0. See Stuttgart. 9.0. Time and News. 9.20. See Stuttgart. 9.30. Local News and Sports Notes. 9.40 (approx.) to 11.0. See Langenberg. 11.0. See Stuttgart. 1.0 a.m. (Monday), Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres; and Kiel, 1,292 kc/s, 232.2 metres. **Lüneburg Day.**—8.0 a.m. (ill Close Down, Programme relayed from Lüneburg. 8.0. Chimes from St. John's and Carillon from St. Michael's Church. 8.25. Divine Service from St. John's Church. 9.45. Sacred Songs for Choir, from St. Michael's Church. 10.15. Karl Soehle Concert—Folk Songs to the Lute, by Schröder and Jermer. 11.0. Wind Instrument Concert, from the Marktplatz. 11.55. Time and News. 12 Noon. Military Band Concert. 1.0 p.m., Programme by the Hitler Legend. 2.0. Chamber Music for two Pianofortes. 2.30. Music in the Lüneburg Theatre; Orchestral Concert from the Marktplatz, with Introductory Dialogue. 3.30. Radio Report from the Lüneburg Rathaus. 3.45. Chamber Music from the Rathaus. 4.45. De Raadmannen in de Hertoghe—a Radio Play in Dialogue, from the Rathaus. 5.50. Military Band Concert. 6.35. Sports Notes and Weather. 7.0.

Concert from St. Michael's Church; The Bremen Cathedral Choir, a String Orchestra, Erna Kroll-Lange and Helene Guhl (Songs), Käthe van Triest (Organ), Otto Adrecht and Bernhard Jackschlat (Songs), and Rümlein (Organ). 8.0. Military Band Concert, followed by Tattou. 9.5. News. 9.35. Review of Political, Cultural, and Art Events. 9.50. Dance Music and Light Music. 12 Midnight, Close Down.

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—10.0 a.m., Programme of Speeches and Music relayed from the Opening of the Wireless Exhibition in Königsberg. 11.0. Concert by the Königsberg Opera House Orchestra, conducted by Brückner; Part I: Dances; Part II: Light Music. 1.0 p.m., Talk on Chess. 1.30. Young People give their Experiences and Impressions of the Labour Service Camps. 2.0. Concert by the Small Station Orchestra, conducted by Eugen Wileken. In the interval at 2.50. Sports Notes. 4.0. Reading (Ernst Wengel). 4.20. Recital of Mozart Songs by Ina Grafius (Soprano). 4.40. Talk: A Nature Lover's Autumn Walk. 5.5. Talk: Through East Prussia. 5.25 (from Danzig). Pianoforte Recital. 5.55. The Gods and Human Destiny in Nordic Saga: The "Edda." 6.25. Talk: Little Known Wrangel Anecdotes, on the Fiftieth Anniversary of the Death of General von Wrangel. 6.50. Sports Notes. 7.0. Dance Music by the



NICO TREEP, conducting the orchestral concert broadcast from Hilversum to-day at 7.55 p.m.

Small Station Orchestra, conducted by Eugen Wileken and the Erich Borschel Dance Band. 9.0. News. 9.15 (approx.). Musical Programme (to be announced). In the interval from 9.45 to 10.0, Relay of a Telephonic Conversation between the Graf Zeppelin and a German Liner. 11.0 (approx.). Close Down.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m. and 20 kW. from 5.40 p.m.—8.10 to 9.40 a.m., Programme of the Workers' Radio Society (V.A.R.A.). 8.10. Pigeon-Flyng and Football Reports. 8.12. Talk on Horticulture. 8.40. Organ Recital. 9.0. Gramophone Music. 9.20. Song and Organ Recital. 10.10 to 11.40. Programme of the Liberal Protestant Radio Society (V.P.R.O.). Divine Service from Haarlem. 11.40 to 4.40 p.m., Programme of the General Broadcasting Company A.V.R.O.). 11.40. Time Signal. 11.41. Talk: The Week's Films. 12.10 p.m., Concert of Light Music. 1.20. Talk: Turkey. 1.40. Weekly Book Talk. 2.10. Concert of French Music by the Wireless Orchestra, conducted by Théodore Matthieu; Soloists: Georges Jonatte (Tenor) and Marix Loevensohn (Cello). 3.40. Choral Concert. 4.0. Gramophone Music. 4.25. News and Sports Notes. 4.40 to 7.40. Programme of the V.A.R.A. 4.40. Programme for Children. 5.40. Concert by the V.A.R.A. Orchestra. 6.30. The Adventures of Wakker and Tropicdout. 6.50. Concert (cont'd.). 7.40 till Close Down. Programme of the A.V.R.O. 7.40. Time and News. 7.55. Concert by the Wireless Orchestra, conducted by Nico Treep; Soloist, Edith Lorand (Violin). 8.55. Violin Recital by Edith Lorand. 9.10. Recitations.

9.30. Gramophone Music. 10.10. Dance Music. 11.40 (approx.). Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. Until 3.40 p.m. Transmitted from Kootwijk, on 50 kW. from 3.40 p.m.—8.10 to 9.10 a.m., Programme of the Christian Radio Society (N.C.R.V.); Divine Service. 9.10 to 4.40 p.m., Programme of the Catholic Radio Society (K.R.O.). 9.10. Gramophone Music. 9.55. Mass from The Hague. 11.10. Gramophone Music. 11.55. Concert by the Vienna Station Octet. 12.40 p.m., Literary Talk. 1.0. Concert (cont'd.). Finale. 1.40. Religious Address. 2.10. Concert by the K.R.O. Orchestra, conducted by van Wond. 2.40. Concert by the Budapest String Quartet, Gramophone Music in the interval. 4.10. Programme for Invalids. 4.40 to 7.25. Programme of the N.C.R.V. 4.40. Divine Service from Maassluis. 6.10. Organ Recital. 7.25 till Close Down. Programme of the K.R.O. 7.25. Football Results. 7.30. Talk: The End of Holy Year. 8.0. Gramophone Music. 8.25. Song Recital. 8.40. News. 8.45. Concert by the K.R.O. Orchestra, conducted by Gerritsen. 9.55. News. 10.0. Concert (cont'd.). 10.20. Choral Epilogue. 10.40 (approx.). Close Down.

**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Sports Notes and Amusement Guide. 8.15. Radio Concert. In an interval at 8.45. News. 10.0. Request Half-Hour. 10.30 to 1.0 a.m. (Monday). Programme in English by the I.B.C. 10.30. Concert of Gramophone Records: The Wedding of the Rose (Jessel); Song: Roehde Hounds (Cliffe); Violin Solo, Dance of the Marionettes (Wintemitz); Organ Solo, Love's Old Sweet Song (Molloy); Negro Nothings (Benmet); Granny's Photo Album (Greer); Pianoforte Solo, Follow a Star (Ellis); Military Band: A Merry Hunting Day (Partridge). 11.0. Orchestral Concert: Serenade (Heykens); Musical Comedy Switch (arr. Ball); Song: Ho Jolly Jenkin (Sullivan); Hungarian Melodies (Korabay); Intermezzo, Liebesfreund (Kreiser); Song: Kilbane (Balfe); Tales from the Vienna Woods (Strauss). 11.30. Instrumental Concert: The Musical Clock of Madame Pompadour (Nuck); Xylophone Solo, The Skaters' Waltz (Waldentel); Hawaiian Guitars, When Work is through (Sherman); Pianoforte Solo with Celeste Accompaniment, The Fairies' Gavotte (Kohn); Accordion Band, Accordion Nights; Violin and Organ Duet, Intermezzo from Cavalleria rusticana (Mascagni); Pianoforte Selection from Bow Bells (Sullivan); The Grasshoppers' Dance (Bucalossi). 12 Midnight, Dance Music: Hold me; The Old Spinning Wheel; Moon Song; When my Little Pomeranian; The Lady I love; I'm one of the Lads of Valencia; My Heart's to Let; Tap your Feet; When you've fallen in Love; Sitin' in the Dark; Leave a Little for me; Let's put out the Lights; Butterflies in the Rain; Isn't it romantic? Waltzing in a Dream; Piccinny; Heaven. 1.0 a.m. (Monday), I.B.C. Goodnight Melody and Close Down.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—10.30 a.m., See Leipzig. 11.0 to 12.15 p.m., See Stuttgart. 12.15. Humorous and Musical Programme. 1.15. Agricultural Talk. 1.30. See Stuttgart. 2.30. Chamber Music. 2.45. Talk for Parents and Children. 3.0. Orchestral and Soloist Concert, relayed from Haan. 5.0. Variety Programme with a Short History of the Lower Rhine (Kallhoff). 5.40. Reading of Stories by Wilhelm Vershoten. 6.0. See Berlin (Deutschlandsender). 6.45. Sports Notes. 7.0. See Stuttgart. 9.0. See Frankfurt. 9.20. See Stuttgart. 9.30. News. 9.40. Dance Music and Light Music, relayed from Haan. 11.0. See Stuttgart. 1.0 a.m. (Monday), Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 318 metres.—10.15 a.m., Talk on the following transmission. 10.30. Wo soll ich fliehen hin—Cantata (Bach) by the Municipal and Gewandhaus Orchestra, the Choir of St. Thomas and Soloists. 11.0. Concert by the Ende Orchestra. 1.0 p.m., Weather and Time. 1.5. Programme Announcements. 1.25. Agricultural Hints. 1.35. Children and Animals before the Microphone. 2.15. Concert of Music by Prince Louis Ferdinand of Prussia, relayed from Jena. Introductory Talk: Prince Louis Ferdinand as Musician. 2.45. A Visit to Dresden Technical school. 3.10. Two Sea Stories. 3.30. Concert by the Station Orchestra, conducted by Willy Steffen.

Soloists: Walter Wilhelm and Kurt Pastohr (Violin). 5.0. Talk: The Scandinavian-German Religious Movement. 5.30. Recital on two Pianofortes. 6.15. Thuringian Animal Stories (Curt Strohmayer). 6.30. A Rosy Future—Sketch (Ernst Klotz). 7.5. Dance Music from Heilsberg. 9.0. News. 9.15 (approx.). Programme to be announced. 10.0. See Munich. 11.0 (approx.). Close Down.

**LINZ.**—See Vienna.

**LUXEMBOURG**

352 kc/s, 1,191 metres; 200 kW.—12 Noon, Concert by the Radio Orchestra, conducted by Henri Pensis. 1.0 p.m., Gramophone Music. 7.0 till Close Down, English Programme. 7.0. Petroushka (Stravinsky) on Gramophone Records. 7.35. Pianoforte Solo: Arabesque Fantasia, Op. 17 (Schumann). 8.15. Concert by the Radio Orchestra: Suite from The Sleeping Beauty (Tchaikovsky); Finlandia (Sibelius); Bacchante from The Seasons (Glazunov). 8.50. News in French. 9.0. Songs by Popular English Singers on Gramophone Records. 9.20. Concert by the Radio Orchestra. 9.50. News in German. 10.0. Concert by the Radio Orchestra. 10.25. Dance Music on Gramophone Records.

**MADRID**

**ARANJUEZ, EAQ, 10,000 kc/s, 30 metres;** 20 kW.—10.30 p.m., Concert of Popular Music. In the interval at 10.45. Humorous Talk. 11.35. Talk. 11.45. Light Music. 12 Midnight to 12.30 a.m. (Monday). Programme in English by the I.B.C. Concert by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Signature Tune, Come Back to Erin; Beautiful Spring; The Old Blind Man; Montana Call; I am so anxious, dear; Mama Inez; The Regiment of Peace; Humming to myself; All through the Night; Signature Tune, Come back to Erin. 12.30 a.m., I.B.C. Good-night Melody and Close Down.

**MADRID**

**EAJ7, 707 kc/s, 424.3 metres;** 2 kW.—8.0 to 9.0 a.m., Topical Review. 11.30. Municipal Band Concert relayed from the Retiro. 2.0. Chimes, Time, Theatre Notes, and Concert of Popular Music. 4.0 to 7.0. Interval. 7.0. Chimes, Announcements, and Dance Music. 8.30 to 9.30. Interval. 9.30. Chimes, Time, and Science Talk. 9.45 (approx.). Variety Programme. 11.30. Dance Music relayed from the Alkazar Dance Hall. 12 Midnight, Chimes. 1.0 to 2.0 a.m. (Monday). Programme in English by the I.B.C. Popular Concert: Blaze Away (Holzmann); Living in a Dream (Rotter); When we went strolling round the Town (Castling); Lovey (Goodhart); Sweet Dreams, Pretty Lady (Downey); My Mother's Garden (Hanley); Sundown in a little Green Hollow (Whiting); I've found the Right Girl (Lapino); Climbing up the Golden Stairs (Heiser); Ding, Dong, Ding (Hargreaves); Love's Old Sweet Song (Molloy); From me to you (King); Somebody stole my gal (Wood); Isn't it Heavenly (Meyer); My Gipsy Rhapsody (Altman); Sweet Savannah Sue (Brooks). 2.0. I.B.C. Good-night Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—6.50 p.m., Variety Programme: Songs, Orchestral Music and a Sketch. 7.40. See Prague. 7.45. See Bratislava. 8.0. Concert by the Station Orchestra, conducted by Plichta; Soloists: Noctar de Fiondor (Soprano) and Richard Kubla (Tenor). 9.0. See Prague. 10.0 (approx.). Close Down.

**MOTALLA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—10.30 a.m., See Leipzig. 11.0. Concert from Würzburg. 12 Noon, Time, Weather and Programme Announcements. 12.10 p.m., Agricultural Talk. 12.30. Through Germany—a Journey on Gramophone Records. 1.30 (from Nürnberg). Chess Lesson. 2.0. Pianoforte Recital. 2.20. Programme for Children. 2.45. Song Recital by Hans Weber (Tenor). 3.5. Talk: The Hof-Garten in Bayreuth. 3.25. Concert conducted by Erich Kloss. 4.40. Reading from the novel Boot (Waggoner). 5.5. Concert. 5.40. Talk: A Mediterranean Cruise on the Steamer "Hamburg." 6.0. In the Twilight—Concert of Folk Music. 7.0. Weather and Sports Notes. 7.15. Concert by the Munich Cathedral Choir, relayed from the Odeon. 8.0. Concert by the Station Orchestra, conducted by Karl List. Soloists: Lissy Bühler (Soprano) and Willy Stühlfauth (Violin); Romantic Overture (Noetzel); Aria from La Vestale (Spontini); Second Suite, Op. 22 (Müller-Rehmann); Aria from Fidelio (Beethoven); Concert in F Sharp Minor for Violin and Violin Orchestra (Haydn); Symphonic Poem, Les Préludes (Liszt). In the interval at 9.0. Time and News. 10.0. Dance Music. 11 (approx.). Close Down.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

OCT. 29th **SUNDAY** continued

**OSLO**

277 kc s, 1,063 metres; 60 kW. Relayed by Fredrikstad, 815 kc s, 368.1 metres; Hamar, 522 kc s, 574.7 metres; Notodden, 671 kc s, 447.1 metres; Porsgründ, 662 kc s, 453.2 metres, and Rjukan, 671 kc s, 447.1 metres.—9.15 a.m., Traffic Report and Weather. 9.20, Chimes and Divine Service, relayed from the Cathedral, Christiansand. 4.0 p.m., Festival Concert, relayed from Trondheim, 605 kc s, 495.8 metres. Programme of Addresses, Songs and Military Music. 5.45, Talk. 6.15, Weather and News. 6.30, Sacred Concert by a Choir. Soloists and a String Quartet, relayed from Bergen, 825.5 kc s, 636.6 metres. 7.0, Time Signal. 7.1, Dramatic Programme. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Concert of Norwegian Music by the Station Orchestra. Soloist: Henry Moe (Bass-Baritone). 10.0 (approx.), Close Down.

**OSTERSUND**.—See Stockholm.

**PALERMO**

558 kc's, 537.6 metres; 3 kW.—9.25 a.m., Bible Reading. 9.40, Sacred Music. 10.5, Agricultural Talk. 11.45, Giornale Radio. 12 Noon to 1.0 p.m., Dance Music. In the interval at 12.30, Time, Announcements and Weather. 4.30 to 5.30, Gramophone Music. 7.0, Dopolavoro Announcements and Giornale Radio. 7.20, Gramophone Music. In the intervals at 7.25, Sports Notes and at 7.30, Time and Announcements. 7.45, Symphony Concert, conducted by La Rosa Parodi; Mattino di primavera (Casavola); Suite with Variations (Toni); Symphony No. 2 in D (Brahms). In an interval, Talk. After the Concert, Gramophone Music. 10.0, Giornale Radio.

**PARIS**

**EIFFEL TOWER**, Call FLE, 207.5 kc's, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals). 12.30 p.m., Concert by the Jean Inos Orchestra. 1.0 p.m., News and Press Review. 1.15 to 2.0, Concert (cont.): Overture and Air from The Magic Flute (Mozart); Ballet Music from Oberon (Weber). 5.45, Le Journal Parle. 7.30, Gramophone Concert. 9.0 (approx.), Close Down.

**PARIS**

**POSTE PARISIEN**, 914 kc/s, 328.2 metres; 60 kW.—10.0 a.m., Selection from II

Trovatore (Verdi) on Gramophone Records. 10.10, Press Review. 10.30, Gramophone Music. 11.0, Orchestral Concert of Variety Music. 12.10 p.m., Interval. 12.15, Sound Film Music. 12.45, Variety Item. 12.50, Programme by Paul Will (Songs). 1.20, Interval. 1.30 to 2.0, Variety Music. 7.0, Le Journal Parle. 7.5, Sports Notes. 7.15, Sound Film Music. 7.30, Catholic Review. 8.0, Popular Russian Songs by the Chœur Soubis Choir (on Gramophone Records). 8.15, Interval. 8.30, Paris—Poetry Programme. 9.0, Interval. 9.15, Concert. 10.50, News.

**PARIS**

**RADIO-PARIS**, Call CFR, 174 kc's, 1,725 metres; 75 kW. 7.45 a.m., Gramophone Music. 8.0, News. 8.30, Physical Culture. 9.20, Advanced English Lesson. 9.40, Elementary English Lesson. 10.0, Elementary Book-keeping Lesson. 10.20, Advanced Book-keeping Lesson. 10.40, Spanish Lesson. 11.0, Interval. 12 Noon, Religious Address by the Reverend Father Dieux. 12.20 p.m., Sacred Music; Cantilene improvisation (Tournemire); Le sommeil de L'enfant Jésus (Busser); Tocata (Boellmann). 12.30, Gramophone Concert. In the interval at 12.45, News. 1.30 to 2.30, Programme in English by the I.B.C. 1.30, Gramophone Music: The Forge in the Forest (Eilenberg); Pomona (Waldteufel); The Top (Gillet); La Fête au Harem (Trichrystal); Nocturne and Cocorico (Ganne); In the Shadows (Fincke); Selection from Eva (Lehár); Parisette (Prodhomme). 2.0, Concert of Dance Music: Signature Tune: Happy Feet; Sing to me; Siloney; Lay your Head on my Shoulder; P.C. 123; Spanish Eyes; Good-night, little Girl of My Dreams; Blue Moment; My Imaginary Sweetheart; Signature Tune: Happy Feet. 3.0 to 3.30, Programme in English by the I.B.C. Orchestral Concert: Crown of Chivalry (Fletcher); Selection from The Belle of New York (Kerker); Love's Old Sweet Song (Molloy); Passing Show of 1914 (Fincke); In Cooland (Bidgood). 3.30 to 4.0, Variety Concert. 5.30, Popular Concert. 7.0, Concert of Light Music. 8.0, Radio Paris Circus. 8.30, News. 8.45, Orchestral Concert, conducted by Maurice André; Soloists: Marjal and

René Juyn (Songs). In the interval at 9.15, News.

**PITTSBURGH**

**KDKA**, 980 kc s, 306 metres; 50 kW.—Relayed by W8XX on 48.86 metres, and 25.27 metres.—5.30 to 6.30 p.m., Radio City Concert, from New York. 7.0 to 9.30, New York Relay. 7.0, Autumn Idyll. 7.30, Variety Concert. 8.0, National Opera Concert. 9.0, Guild and Shelter. 9.15, Morin Sisters. 9.30, Vesper Services. 10.30, Grand Hotel, from New York. 11.0, Pathé News. 11.15, Weather and Sports Notes. 11.30, Happy Felton's Orchestra. 12 Midnight to 2.45 a.m. (Monday), New York Relay. 12 Midnight, Vincent Lopez Orchestra. 12.30, Joe Penner. 1.0, Light Opera Nights. 2.0, Gilt Headliners. 2.30, Walter Winchell. 2.45, Marvellous Melodios. 3.0, Novelty Orchestra, from New York.

**PORSGLUND**.—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—10.30 a.m., Trio in A minor (Ravel), by the Paris Chamber Trio. 11.0, Chimes. 11.5, News. 11.15, Military Band Concert. 12.30 p.m., Agricultural Talk. 12.45 to 12.55, Social Report. 1.50, Talk on the following Transmission. 2.0, Hansel and Gretel-Opera in Three Acts (Humperdinck), relayed from the National Theatre. 4.29, Gramophone Music. 4.30, Talk. 4.45, Gramophone Music. 5.0, German Transmission: Music Review: The Jewel Box—Radio Play (Wolfenstein), and News. 6.0, Time and News. 6.5, See Brno. 6.50, See Moravska-Ostrava. 7.40, Talk by Hassan Vash Bey, the Turkish Consul. 7.45, See Bratislava. 8.0, Turkish Festival concert by the Station Orchestra. In the interval, Talk on Turkish Music. 9.0, Time and News. 9.20, Czech Dance Music on Two Pianofortes. 10.0 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**SOTTENS**, 743 kc/s, 403 metres; 25 kW.; and **GENEVA**, 395 kc/s, 760 metres.—2.0 p.m. (from Geneva), Light Music on Gramophone Records. 4.0 to 5.0, Interval. 5.0 (from Geneva), Gramophone Concert. 6.0 (from Geneva), Catholic Address. 6.30 (from Geneva), Radio Chronicle and Sports Notes.

7.0 (from Geneva), The Week's Review. 7.10 (from Geneva), Cello Recital by Morel. 7.35 (from Geneva), Interlude by Edouard Combe. 7.50 (from Geneva), Concert, relayed from St. Joseph's Church; the Radio Orchestra, conducted by Robert Echenard; Soloist, William Montillet (Organ). 9.0, News and Weather. 9.10 (approx.), Close Down.

**REYKJAVIK**

250 kc/s, 1,200 metres; 21 kW.—11.40 a.m., Weather Forecast. 12 Noon, Divine Service. 4.0 p.m., Variety Music. 7.45, Programme for Children. 8.10, Weather Forecast. 9.0, Light Music, followed by Time and News. 9.30, Talk. 10.30, Symphony, No. 1 (Sibelius), followed by Dance Music. 1.0 a.m. (Monday), Close Down.

**RJUKAN**.—See Oslo.

**ROME**

Call 1RO, 680 kc/s, 411 metres; 50 kW. Relayed by Naples, 911 kc s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.45 p.m., and 2RO, 11,810 kc/s, 25.4 metres from 4.0 p.m.—9.0 a.m., News, Sports Notes and Amusement Guide. 9.45, Bible Reading. 10.0 to 11.0, See Turin. 11.30, Gramophone Music. 11.45 to 1.0 p.m., See Turin. 1.0, Time and Announcements. 1.15 (approx.) to 4.0, Interval. 4.0, Sports Results. 4.15, Vocal and Instrumental Concert. In the interval at 5.0, Sports Notes. 5.30, Weather. 5.40 (approx.) to 6.30, Interval. 6.30, Sports Notes and News. 6.45, Soprano Songs. 7.0, Time and Announcements. 7.25, Sports Notes. 7.45, Variety Concert. Rodolfo Caporali (Pianoforte) and Vella Capriano (Soprano). 9.0 (approx.), Variety Music and Operetta Music. 10.0, Giornale Radio.

**SALZBURG**.—See Vienna.

**SCHENECTADY**

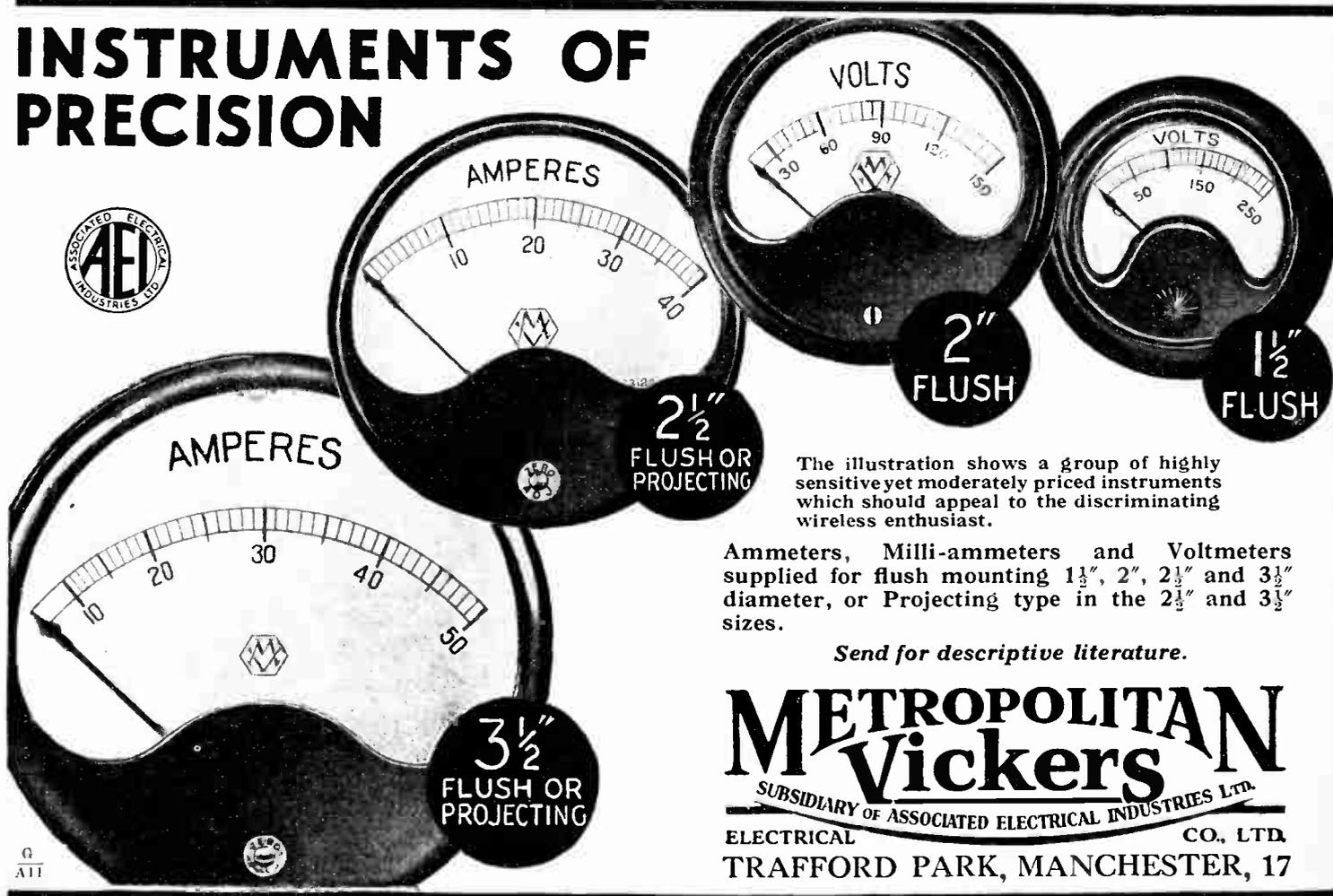
**WGY**, 790 kc s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—12.45 to 3.30 a.m. (Monday), New York Relay. 12.45, Wendell Hall, Songs. 1.0, Rubinoff's Orchestra. 2.0, Manhattan Merry-Go-Round. 2.30, American Album of Familiar Music. 3.0, Jack Benny; Frank Black's Orchestra. 3.30, Impressions of Italy, from New York, followed by Programme Resumé.

**SCHWEIZERISCHER**

**LANDESENDER**

**BEROMUNSTER**, 653 kc/s, 450 metres, 60 kW.; **Basle**, 1,229 kc/s, 244.1

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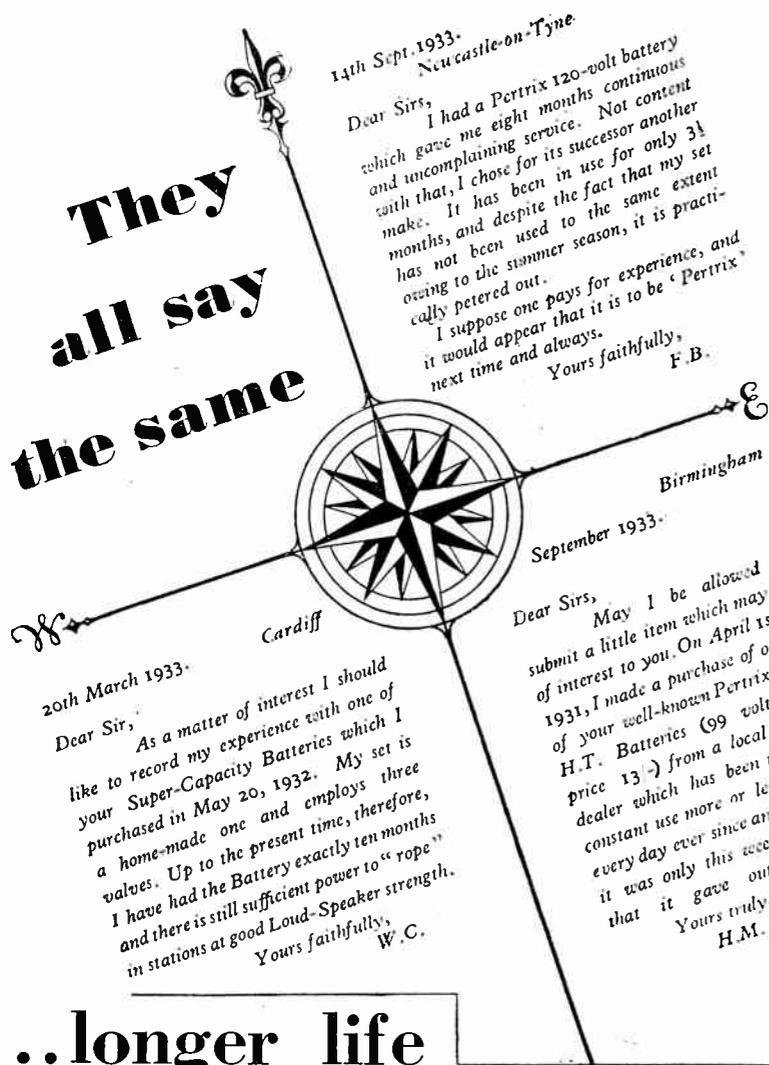
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OCT. 29th **SUNDAY** continued

metres; and Berne, 1,220 kc/s, 245.9 metres.—9.0 a.m. (from Berne). Catholic Service, 9.45 (from Berne). Gramophone Concert, 9.55 (from Berne). Literary Programme, 10.30 (from Berne). Jery and Bütli—Musical Play (Bronsard), 11.30, Time, Weather and News, 11.40 (from Zürich). Concert by the Radio Orchestra, 12.30 p.m. (from Berne). Agricultural Talk, 1.0 (from Berne). Talk: Vegetables—Growing, 1.30 to 3.0, Interval, 3.0 (from Berne). Music by a Mandoline Orchestra, 3.35 (from Berne). Fairy Tales from Five Continents—The Tale of Ali Achmar, 4.0 (from Berne). Concert by the Milan Trio, 4.50 (from Berne). Gramophone Music, 5.0 (from Berne). Chess Lesson, 5.30 (from Berne). Talks in French: (a) The Origin of the French Language, (b) Commentary on La chanson de Roland, 6.0 (from Berne). Time and Sports Notes, 6.5 (from Berne). Gramophone Music, 6.10 (from Berne). Popular Music, 6.50 (from Berne). Die g'rentschti Frace—A Comedy in Three Acts (Von Tavel). In the interval at 8.0, News, 8.35, Concert of Swiss Music, 9.15 (from Berne). Sports Notes and Close Down.

SOTTENS.—See Radio-Suisse Romande.

### STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,328 metres; Östersund, 389 kc/s, 770 metres, and Sundsvall, 554 kc/s, 542 metres.—8.0 a.m., Rural Programme, 8.30, Gramophone Music, 9.10, Talk, 9.30 to 9.50, Book Review, 10.0, Divine Service, relayed from Uppsala, 662 kc/s, 453.2 metres, 11.45, Weather, 2.0 p.m., Programme for Children, 2.20, Talk on Turkey, with Gramophone Records of Turkish Music, 3.0, Elementary English Lesson, 3.30, Gramophone Music, 4.30, Reading, 5.0, Evensong, relayed from Karlskrona, 1,530 kc/s, 196 metres, 6.15, Weather and News, 6.35, The Dance of Death—Play (Strindberg), 8.10, Concert by the Station Orchestra, conducted by Adolf Wiklund, 8.45, Weather and News, 9.0, Concert (contd.), 10.0 (approx.), Close Down.

### STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—9.30 a.m., Orchestral Concert, conducted by Roskani, 10.45, Protestant Service, 11.30, Catholic Service in German, 12 Noon, Gramophone Concert, 12.45 p.m., News, 1.0, Time Signal, 1.1, Extracts from Die Fledermaus—Operetta (Joh. Strauss), on Gramophone Records, 1.45, Talk in German: The Red Cross, 2.0, Agricultural Talk, 2.15, Interval, 3.0, Symphony Concert by the Conservatoire Concert Society, relayed from the Conservatoire, Paris, 5.0, Pianoforte and Violin Recital by Madeleine de Valmalette and Jacqueline Salomons, relayed from Metz, 7.0, Medical Talk, 7.15, Sports Talk, 7.30, Time and News, 7.45, Gramophone Music, 8.0, Press Review in German, Lottery Results and Announcements, 8.30, Alsatian Programme, 10.25 (approx.), Press Review in French, 10.30 Dance Music from the Savoy, 12 Midnight (approx.), Close Down.

### STUTTART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—10.30 a.m., See Leipzig, 11.0, Concert by the Station Orchestra, conducted by Otto Seyfert, 12 Noon, Discussion between Kleinau, the Composer, Otto Krauss, and Fritz Gauss: Modern Developments in Opera, 12.15 p.m., Melodies from Foreign Lands—Gramophone Concert, followed by German Opera Overtures, 1.15 (from Karlsruhe), Agricultural Talk, 1.30, Programme for Children, 2.30 (from Karlsruhe), Wine—Songs, Lute, and Pianoforte Music, 3.0, See Langenberg, 5.0, Variety Programme, 5.40, Swabian Peasant Dances and Swabian Humour—Musical and Literary Programme, 6.10, Sports Notes, 6.30, Our Homeland—A Sequence of Local History Relays—No. 42, A Peasant House in the Hotzenwald, 7.0, Bunter Abend, relayed from the Festhalle, Freiburg, 9.0, See Frankfurt, 9.20, Topical Talk, 9.30, Local News, 9.40 (approx.) to 11.0, See Langenberg, 11.0, Serenade, 1.0 a.m. (Monday), Close Down.

SUNDSVALL.—See Stockholm.

### TOULOUSE

779 kc/s, 385 metres; 8 kW.—11.0 a.m., Dance Music, 11.30, Orchestral Music, 12 Noon, Operetta Music, 12.15 p.m., Military Music, 12.30, Sacred Music, with Catholic Address, 12.45, Airs from Opera, 1.0, Amusement Guide and Market Prices, 1.5, Light Music, 1.15, Chansonnètes, 1.30, Opera Music, 1.45, Sacred Music, with Protestant Address, 2.0, Sound Film Music, 2.15, Agricultural Report, 3.15, Orchestral Music, 3.45, Chansonnètes, 4.0, Accordion Music, 4.15, Music by a Viennese Orchestra, 4.30, Operetta Music, 4.45, Argentine Music, 5.0, Thé Dançant, 5.45, Light Music, 6.0,

News, 0.15, Songs, 6.30, Military Music, 6.45, Opera Music, 7.0, Light Music, 7.30, Tyrolese Music, 7.45, Operetta Music, 8.0, Sound Film Music, 8.15, Bal-musette, 8.30, Orchestral Music, 8.45, Opera Music, 9.0, Quartet in D Minor, No. 6 (Schubert), 9.30, Chansonnètes, 9.45, Accordion Music, 10.0, Military and Choral Music, 10.15, North African News, 10.30, Programme for Listeners in Morocco: Recitations from de Musset, Ronsard, and Lamartine, followed by Light Music, 11.0, Dance Music, 11.30, Operetta Music, 11.45, Viennese Music, 12.0 Midnight, News, Weather, and Announcements, 12.5 a.m. (Monday), Music from Operas, 12.30 (approx.), Close Down.

### TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—8.40 a.m., See Turin, 8.55, Mass from the Cathedral of San Giusto, 10.0, Religious Address, 10.20, Agricultural Notes, 11.0 till Close Down, See Turin.

TRONDHEIM.—See Oslo.

### TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—8.40 to 8.55 a.m., Giornale Radio, 9.40, Agricultural Report, 10.0, Mass from the Church of the Annunciation, Florence, 11.0 to 11.15, Bible Reading, 11.30, Gramophone Music, 11.45, Sponsored Music, 12 Noon, Time and Announcements, 12.5 p.m. to 1.0, Variety Concert, 2.0, Transmission of an Opera. In the interval, Sports Notes and Relay from the San Siro Race Course. After the Opera, Sports Notes, 5.15 to 5.20, Weather, 6.0, Time, Announcements and Gramophone Music, 6.15, Gramophone Music, 7.0, Time, News, and Gramophone Music, 8.0, Variety Programme. In the intervals, Talk, Theatre Notes and Giornale Radio.

### VIENNA

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—8.0 a.m., Mass in F Minor (Bruckner), relayed from St. Stephen's Cathedral, 9.0, Religious Address, 9.50, Light Music on Gramophone Records, 10.30, Song Recital by Georg Maikl (Tenor), 11.0, Robert Volkmann Concert by the Wiener Symphoniker, conducted by Martin Spörr, 11.55 to 1.0 p.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer, 1.30, Time, Programme Announcements and News, 1.45, Talk: Care of the Orchard in Autumn, 2.5, Review of Books in Austrian Dialects, 2.30, String Quartet in C (Cherubini) by the Kolbe Quartet, 3.5, A pleasant Interlude, 3.30, Concert by the Wiener Symphoniker, conducted by Josef Holzer, 4.50, A Meditation (Ernst Lissauer), 5.15, Turkish Evening for the Tenth Anniversary of the Proclamation of the Turkish Republic, 6.0, Arabella—Comie Opera in Three Acts (Richard Strauss), relayed from the State Opera House. News in the intervals, 9.5, Concert of Light Music on Gramophone Records.

### WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—8.0 a.m., Time Signal and Hymn, 8.5, Gymnastics, 8.20, Gramophone Records. In the interval at 8.35, Radio Journal, 8.52, Hints for the Housewife, 8.55, Programme Announcements, 9.0, Divine Service, relayed from Lwów, 788 kc/s, 381 metres, 10.45, Sacred Music on Gramophone Records, 10.57, Time Signal and Fanfare from St. Mary's Church, Cracow, 11.5, Programme Announcements, 11.10, Weather, 11.15, Wagner Concert by the Philharmonic Orchestra, conducted by Goldstein, Soloist: Wraga (Bass). In the interval at 12 Noon, Talk: Salaries in Poland, 1.0 p.m., Agricultural Talk, 1.15, Agricultural Market Report, 1.25, Viennese Waltzes on Gramophone Records, 2.0, Agricultural Programme, 2.25, Concert by a Young People's Orchestra. In the interval, announcements, 3.0, Programme for Children, 3.30, Yehudi Menuhin on Gramophone Records, 3.45, Reading of Poetry, 4.0, Talk, 4.15, Recital of Polish Music by Mme. Umiska (Violin) and Janowski (Tenor), 5.0, Programme to be announced, 5.40, London Dance Bands on Gramophone Records, 6.0, News, 6.5, Miscellaneous Items, 6.30, Review of the Week, for Young People, 6.45, Programme Announcements, 6.50, Light Music on Gramophone Records, 7.0, Programme for the Turkish National Festival. Speech by the Turkish Ambassador. The Polish National Anthem. Speeches by Representatives of the Foreign Minister. The Turkish National Anthem. Talk on Turkey, Pianoforte Recital: Five Pieces (Cemal); Turkish Scenes on Anatolian Dance Themes, 7.50, Radio Journal, 8.0, Topical Talk, 8.15, Humorous Programme, relayed from Lwów, 9.15, Sports Notes, 9.25, Dance Music from the Adria Café. In the interval at 10.0, News, Weather, and Police Notes.

ZÜRICH.—See Schweizerischer Landessender.

# MONDAY

OCTOBER THE THIRTIETH

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations and Gramophone Concert. 6.0, Programme for Children. 6.45, News. 7.0, Gaelic Talk. 7.15, Poetry Recital. 7.30, Time Signal. 7.31, The Station Orchestra. 7.50, Concert by the Caledonian Male Voice Choir. In an interval at 8.20, Orchestral Music. 8.45, Orchestral Music. 9.0, Soprano Solos by Mollie Phillips. 9.15, Gaelic Song Recital. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Pianoforte Recital by Mr. Fred Stone. 9.45, Accordion Band Music: Flor de Cuba (Gregor); The Old Rustic Bridge by the Mill (arr. Wood); Wireless World Announcement; Accordion Duet. Lido Lady Mazurka (Perry); Spanish Sweetheart (Hargreaves). 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Dance Music: Isn't it Heavenly; The Gold Diggers' Song; Dancing Butterfly; Good Friends; Morning, Noon and Night; I can't remember; Stay out of my Dreams. 10.30, Time, News and Weather. 10.40, Traditional Fiddle Solos by Michael O'Duinn. 10.50, Uilleann Pipe Solos by Leo Rowsome. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1; 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Trio No. 4 in E (Haydn); Selection from Samson and Delilah (Saint-Saëns); Melody (Heumann); Queen Mary's Song (Elgar); Adagio and Allegretto from the Moonlight Sonata (Beethoven); Bolero (Moszkowsky). 7.0, Request Gramophone Records. 7.20, Sports Notes. 7.30, Exchange and Talk in Catalan. 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral. Weather, Exchange, and Market Prices. 9.5, Humorous Review of the Week in Verse. 9.15, Concert of Sardanas. 10.0, Orchestral Concert, conducted by Joan Tomàs. 10.45, Light Music, relayed from the Café Español. In the interval at 11.0, News. After the Relay, Gramophone Music. 12.0 Midnight, Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—3.30 p.m., Gramophone Music. 3.55, See Rome. 5.35, News in Albanian. 5.45, See Rome. 7.40, Il gobbo del Califfo—Opera in One Act (Franco Casavola). 8.30 (approx.) till Close Down. See Rome.

BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—3.0 p.m., Yugoslavian Songs. 3.30, Talk. 4.0, Dance Music on Gramophone Records. 5.55, Time Signal and Programme Announcements. 6.0, Talk. 6.30, Violin Recital: My Country (Smetana); Melody (Tchaikovsky); Serenade (Arensky); Après un rêve (Faure); Spanish Serenade (Chaminade-Kreisler); Spanish Dance (Granados-Kreisler); Romanian Serenade (Dimitrijescou); Village Dance (Dimitrijescou). 7.0, The Barber of Seville—Opera (Rossini), on Gramophone Records. 9.0, Time, News and Cigány Music from the Petrosacka Zadruga Restaurant.

## BERLIN

DEUTSCHLANDSENDER (Reichsender) 183.5 kc/s, 1,635 metres; 60 kW.—11.0 a.m., Weather. 11.5 (approx.), Gramophone Concert. Part I: Folk Songs. Am Brunnen vor dem Tore; In einem kühlen Grunde; Gold'ne Abendsonne; Masurenlied; Schön ist die Jugend; Was die Heimat singt. Part II: Light Music. Potpourri of Dances, Wir sehen alles doppelt (Lincke); Old Folk Melody. Lustig ist das Zigeunerleben; Selection from The Merry Widow (Lehár); Selection from The Bird Fancier (Zeller); Potpourri, Mühelner Bilderbogen (Gulden); In Deine Hände (Kollo); Waltz, Frühlingslied (Strauss). 11.55, Time Signal. 12.45 p.m., News. 1.0, Gramophone Concert. Potpourri, Vom Singen und Wandern; Potpourri, Frühlingsjubel; Frisch gesungen (Silcher); Ich bin nur ein armer Wandergesell (Künneke); Trink dich gesund (Schmidt); Vor einer alten Spieluhr (Mueller); Selection from Musik und Liebe (Müller); Humoresque (Dvorák); Valse des Fleurs, from The Nutcracker Suite (Tchaikovsky); Waltz from Gipsy Love (Lehár); Rosenkranz (Carste); Waltz, Mitternachtsträume (Carste). 2.0, Gramophone Concert. Overture, Oberon (Weber); Introduction to Third Act of Lohengrin (Wagner); Der Schreckenberger (Wolf); Frühling übers Jahr (Wolf); Waltz from the Serenade for String Orchestra (Tchaikovsky). 2.30, Weather and Exchange. 2.45, Gramophone Concert (cont'd.). Overture, Der Opernball (Heuberger); Selection from Die toten Augen (d'Albert); Selection from The Bartered Bride (Smetana); Polovtsian Dances (Borodin). 3.0, See Breslau. 4.0, Educational Talk. 4.25, Sonata for Horn and Pianoforte (Joseph Haas). 4.40, Recital of Schubert Songs by Eva Liebenberg. Schuchst; Auflassung; Ave Maria; Totenkräbers Heimweh. 5.0, Poems. 5.5, Talk on Sport for Young People. 5.20, Talk on Fritz Reuter. 6.45, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, To-day's Motto. 7.5, Topical Talk. 7.20, Talk: Kemal Pasha

—the Field Marshal and Statesman of Turkey. 7.45, Relay of the Address by Nizamettin Ali Bey from the Turkish Board of Trade, on the Tenth Anniversary of the Turkish Republic. 8.0, Dance Music. 9.0, News. 9.45, Weather. 10.0, See Munich. 11.0 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW.—3.0 p.m., Songs of Richard Kirsch, by Hans Eggert (Baritone), with the Composer at the Pianoforte: Gab mir; Winterlied; Die kleine Bleicherin; Ans der Ferne in der Nacht; Ländler des Verliebten. 3.15, Talk: A Shipwreck in the Sea of Marmora. 3.30, Concert by Jaro Michalek and his Band: Overture, Il Seraglio (Mozart); Frühlingsglaube (Schubert); Ein Walzer aus Wien (German); Serenade (Schubert); Italian Folk Songs (de Micheli); Serenata appassionata (Murzilli); Serenade, Abita (Meisel); Kleiner Walzer (Bort-Steiner). 4.30, Talk. Weddigen, The Submarine Hero. 4.50, Reading from his own Works by Hans von Hülsen. 5.30, The Funkstunde informs its Listeners. . . . 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Lottery Announcement. 7.5, See Munich. 8.0, Chamber Music on Gramophone Records: Trio in B flat, Op. 11, for Clarinet, 'Cello and Pianoforte (Beethoven); Theme with Variations from the Clarinet Quintet in A (Mozart). 8.30, Schumann's Fourth Symphony in D Minor, Op. 120, by the Station Orchestra, conducted by Eugen Jochem. 9.0, Weather and News. 9.15 (approx.), Light Music and Dance Music by the Jaro Michalek Band on Gramophone Records. In the interval from 10.0 to 10.5, A Warning by the Chief of Police. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.30, News and Racing Results. 7.35, Talk: Bordeaux a Century ago. 7.50, Lottery Results. 8.0, Talk on Social Hygiene. 8.15, News. 8.30, Concert of Classical and Modern Music.

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.30 p.m., Recital of Slovak Folk Songs by Arnold Flögl (Bass). 4.55, Concert by the Station String Quartet: Quartettino (Katenda); Quartet in A minor (Mozzys). 5.55, Talk for Housewives. 6.0, See Prague. 7.0, See Moravská-Ostrava. 7.30, A Play and Talks, relayed from Kosice, 1,022 kc/s, 293 metres. 8.0, Talk: October 30th and its Meaning. 8.10, Orchestral Concert, conducted by Dyk: Overture (Bella); Romance (Figu-Bystry); Recitation; Serenade (Babusek); Elegy and Dance (Schneider-Trnavsky); Selection of Slovak Folk Songs (Mozzys). 9.0, See Prague. 9.15 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.5 p.m. (approx.), Gramophone Concert. 12.45, Time, Weather, News, Exchange and Shipping. 1.10, Songs of the Eighteenth Century—Recital by Elise Schützler (Soprano). 1.40, Programme arranged by the Post Office, with Gramophone Records. 2.0, Market Prices. 2.15, Talk: A Railway Platform is inaugurated. 2.35, Talk: The German Trade Mark now and in the Days of the Medieval Guilds. 3.0, Concert by the Station Orchestra, conducted by Rischka: Overture, Hans Heiling (Marschner); Scherzo in B flat (Schubert); Selection from Oberon (Weber); Barcarolle (Tchaikovsky); Rhapsody on Swedish Folk Songs (Atterberg); Two Pieces (Wagner); (a) Albanblatt, (b) Helmsman's Song and Sailors' Chorus from The Flying Dutchman; Waltz, Die Hydropathen (Gungl); Potpourri, Von Bühne zu Bühne (Fetras); Die Schneet-berlingsagd (Keler-Bela). 4.30, Market Prices and Talk. 4.50, Topical Talk. 5.10, Flute Recital of Music of the Baroque Period: Sonata in F (Handel); Sonata in B Minor (Montesoni); Sonata in C (Ph. E. Bach). 5.30, Talk: The Law under the New Regime. 5.50, Meat Market Prices. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, News. 7.10, Wagner-Liszt Symphony Concert, relayed from the Konzerthaus: The Silesian Philharmonic Orchestra, conducted by Franz von Hoesslin. Soloist: Konrad Hansen (Pianoforte). Overture, The Flying Dutchman (Wagner); Siegfried Idyll (Wagner); Pianoforte concerto in E flat (Liszt); March, Bacchanal and Overture from Tannhäuser (Wagner). In the interval from 7.50 to 8.5, News. 9.0, See Munich. 9.20, Time and News. 10.0, See Munich. 11.0 (approx.), Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—5.25 p.m., German Transmission News and Talks (a) The Economic Crisis, (b) Earthquakes. 6.0, See Prague. 7.0, Military Band Concert. 7.30, A Play and Talks, relayed from Kosice, 1,022 kc/s, 293 metres. 8.0, See Bratislava. 9.0, See Prague. 9.30 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R.; 590 kc/s, 509 metres; 15 kW.—12 Noon, Gramophone Concert. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Pierre Lecmans. Soloist: Wigy (Violin). Italian March (Rousseau); Waltz, Die Nachtschwärmer (Ziehrer); Serenade (d'Ambrosio); Selection from A Masked Ball (Verdi); Czardas for Violin (Monti); Selection from The Girl in the Taxi (Gilbert); The Blue Pavilion (Armandola); Waltz (Sylviano); Foxtrot, Flapperette (Greer). 5.0, Concert by the Station Symphony Orchestra, conducted by Jean Kumps: Overture, Raymond (Thomas); Intermezzo (Camuel); Slav Dance (Chabrier); Suite (Ducasse); Quartet (Malein-gren); Viennese Waltz (Lonque); Ballet Suite (Glazunov). 6.0, Talk: Eugène Ysaie. 6.15, Gramophone Music. 6.45, The Country Cousin—Sketch (Marcel Lefèvre). 7.0, Quartet in C Minor, Op. 51 (Brahms), on Gramophone Records. 7.30, Cinema and Theatre Reviews. 8.0, Spain and Italy—Concert by the Radio Orchestra, conducted by Franz André. Soloist: Conchita de Oliveira (Soprano). Extract from the Spanish Caprice (Rimsky-Korsakov); Extract from the Spanish Symphony for Violin (Lalo); Spanish Dances (Granados); Popular Songs by Falla (arr. Nin); Extract from the Suite, España (Albeniz); Italian Caprice (Tchaikovsky). 8.45, Wallon Programme. 9.0, Concert (cont'd.). Soloist: Clément Doucet (Pianoforte); Neapolitan Nights (Marti); African Dances (Ring); Divertissement flamand (Vidal); Pianoforte Solos of American Music; New Sound Film and Jazz Music. 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R.; 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish. 12 Noon, Concert by the Small Station Orchestra, conducted by Lecmans: Cortège oriental (Lecmans); Promenade matinale (Van Hoof); Oriental Miniatures (Fischer); Gavotte (Gonart); Dream (Baeyens); Crémignon (Gilson); Mijn Moederspraak (Benoit); Selection from Quo Vadis (Nougès); Ballet Music from Henry VIII (Saint-Saëns). 1.0 p.m., Journal Parlé. 1.10, Act I of La Gioconda (Ponchielli), on Gramophone Records. 5.0, Concert by the Radio Orchestra, conducted by Franz André: Unity March (Walpot); Selection from The Three Musketeers (Frinzel); In a Chinese Temple Garden (Ketselby); Hungarian Dances Nos. 1 and 2 (Brahms); Scène de chasse (Fauchey); Habanera and Waltz (Maes); Russian March (Gauwin). 5.45, Programme for Children. 6.30, Concert by the Small Station Orchestra, conducted by Lecmans: Overture, Die Frau Meisterin (Suppe); Selection from La Mascotte (Audran); Suite, Algerian Nights (Griegh); Waltz, Le pas des fleurs (Delibes); Papillon from the Children's Suite (Kalkman); Oriental March (Ross); Waltz, Gold and Silver (Lehár). 7.12, News. 7.15, Talk: A Great Liberal: Thorbecke. 7.30, Pirreke Pirrewit. 8.0, Concert by the Station Symphony Orchestra, conducted by Kumps. Soloist: Hellinx (Soprano); Overture, A Midsummer Night's Dream (Mendelssohn); Two Popular Songs (Baeyens); Intermezzo from Cavalleria rusticana (Mascagni); Ballet Suite, L'Aurore (Van Durmo). 8.45, Talk: The Belgian Fiscal System. 9.0, Concert (cont'd.): Festival March (Gilson); Dramatic Overture (Depuis); Serenade (Walpot); Invitation to the Waltz (Weber); Au crépuscule (Marsick); Allegro from the Italian Symphony (Mendelssohn); Papillon bluettes (Van Oost); Overture, William Tell (Rossini). 10.0, Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra: March (Blanchburg); Waltz, Auf der schönen grünen; Narcuta (Kozzak); Overture, Frau Luna (Lincke); Selection from Zaza (Lecnea-vab); Harlequinade (Blumann); Moroccan Patrol (Jessel); Hindu Song (Rimsky-Korsakov); Chanson triste (Tchaikovsky); Melody (Rubinstein). 5.0, Radio Journal. 5.15, Song Recital. 5.30, Concert (cont'd.): Ballet Egyptian (Luigni); Selection from Bouche à bouche (Vvain); Two Pieces (Fetras). 6.0, Educational Talk. 6.20, Gramophone Music. 6.45, Talk. 7.0, Pianoforte Recital: Sonata in F (Haydn); Sonata in D (Mozart); Sonata in F Sharp Minor (Rust). 7.30, Talk. 7.45, Song Recital. 8.15, String Quartet (Brahms), by the Metzner Quintet. 8.45, Radio Journal. 9.0, Orchestral Concert, relayed from the Enesco Restaurant.

## BUDAPEST

546 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 7.0 p.m. till Close Down.—4.0 p.m., Talk. 4.30, Orchestral Concert. 5.30, German Lesson. 6.0, Gramophone Concert. 7.0, Humorous Programme. 7.30, Volkmann Concert for the Fiftieth Anniversary of his Death. The Station Orchestra, conducted by Rajter. Soloist: Paul Hütter (Cello). Introductory Talk. Overture, Richard III; Cello Concerto; Serenade in D Minor; Serenade in F; Overture. 9.0, News. 9.20, The Farkas Cigány Band and the Bachmann Jazz Band, relayed from the Café Bodo. Soloist: Dáni (Songs).

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time and Chimes from the Town Hall. 11.5 (approx.), to 1.0 p.m., Light Music, relayed from the Hotel d'Angleterre. 2.20, Talk for Housewives. 2.30, Concert by the Carl Rydahl's Instrumental Ensemble. Overture, Lucia di Lammermoor (Donizetti); Waltz, Les fleurs (Waldteufel); Selection from Martha (Flotow); Cradle Song (Henriques); Copenhagen (Rosenberg); Intermezzo from Naïfa (Delibes); Selection from Den lille Princesse (Rygaard); Waltz, Pomona (Lumbye); Intermezzo, Pizzicato (Pierrot); Serenade (Kubén); Tango (Andersen); Flute Solo. Theme with Variations (Peterson); Waltz (Monando); March, The Last Stand (Myddleton). In the interval at 3.15 (approx.), Reading. 4.30, Exchange and Fish Market Prices. 4.45, Talk. 5.15, Elementary English Lesson. 5.45, Weather. 5.54, Announcements for the Worker's Radio Society. 6.0, News. 6.15, Time Signal. 6.30, A Discussion. 7.30, Concert of Folk Music by the Radio Orchestra, conducted by Launy Gröndahl. 8.25, A Visit with a Microphone. 8.55, News. 9.10, Saxophone Recital. 9.30, Lecocq Concert of Operetta Music, by the Radio Orchestra, conducted by Launy Gröndahl. Overture, Giroflá-Giroflá. Selection from La fille de Madame Angot. Waltz Overture, Le petit Duc. 10.0, Dance Music, relayed from the Nimb Restaurant. 11.0, Time and Chimes from the Town Hall.

CORK.—See Athlone.

## CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Review of New Books. 6.20, Miscellaneous Items. 6.25, Talk on Music relayed from Lwow, 788 kc/s (381 metres). 6.40, Programme Announcements. 6.45, See Warsaw. 9.30, Sports Notes. 9.40, Light Orchestral Music, relayed from the Pavillon Restaurant. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11 a.m. to 12 Noon, Programme in English by the I.B.C. Happy Hour. Part I—Orchestral Concert: Signature Tune; Dubinuschka Potpourri (arr. Alexander); Banjo Quartet, Snatches of Song (arr. Grimsshaw); The Ghost Walk; Selection from The Cat and the Fiddle (Kern); Moonlight at Sanssouci (Rotter); Mandolinata (de Pietro); Lafin' at Life; Ginger Snaps (Hoordon). Part II—Dance Music: Lovers' Lane; Bing, Dong, Ding; I've got to pass your House; Whistling under the Moon; Look what you've done; I always keep my girl out late; Sentimental Gentleman from Georgia; Mary Rose; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.30, Programme in English by the I.B.C. 4.30, The I.B.C. Nursery Corner. 5.0, Concert for Children and Bognor. Tango Band: Signature Tune: Night by the sea; There was a poor Musician (Schwartz); Plegaria (Bianco); Will you dance through life with me (Swabach); The Song of the Rose (Battero); Te fuiste ja ja (Matos); Jealousy (Gade); Adios Juventud; Marion (Hollander). 5.30, Concert for Hastings and Eastbourne Listeners: Magic Notes (Stühinger); Pianoforte Solo, Just humming along; Song, Me and mine are doing fine (Woods); Pianoforte and Xylophone Duet, The Match Parade (Welle); Where are you; Popular Melodies on a Piano; Song, Down in the Valley (Harrington); Slippery Fingers (Steele); Signature Tune. 6.0, Programme in French. 10.0 (approx.) till Close Down, Programme in English by the I.B.C. 10.0 (approx.), Dance Music: Signature Tune, The Bells of Normandy; What a perfect Combination; My Wishing Song; Spanish Sweetheart; I've found the right Girl; My Moonlight Madonna; I'll take an option on you; Blue; Don't blame me; Forty Second Street; A Girl like Nina; Oh Johanna! Sweet Dreams, pretty Lady; Lazy-bones; Isn't it heavenly; Reflections in the Water; Egypt; Signature Tune. 11.0, Talkie Time: Tunes from the Talkies; Signature Tune, Sittin' in the Dark; Whistling under the Moon; I've got to pass your house; Everyone says I love you; Selection from Il est charmant (Moretti); Song, I've found the right Girl; Heaven will protect an honest Girl; Smilin' through; Skippy; Signature Tune. 11.30, Club Concert for Warrington and Leigh Listeners.

OCT. 30th **MONDAY** continued

Part I—Concert of Gramophone Records: Signature Tune, The Chum Song; Waltz, Artists' Life (Joh. Strauss); Same Old Moon; I had to go and find another Job; Coney Island; Sam's Medal; Marta; That must have been our Walter; Git along. 12.5 a.m. (Tuesday), News Bulletin in English. 12.10 (approx.). Chub Concert. Part II: Ali Baba's Camel; Way out in Kansas; Rockin' Chair; Hobo, you can't ride this Train; Where are you to-night; Signature Tune. 12.30, Dance Music: Ding, Dong, Ding; I'll show you off; Sundown in a little Green Hollow; At the Old Pig and Whistle; Learn to croon; Flor de Cuba; I bring a Song; Isn't this a Night for Love. 1.0, Dance Music: Signature Tune, The Bells of Normandy; I live for Love; With you here and me here; Down in the Valley; Lovers' Lane; Sweetheart Darlin'; Blue Cloud; Aloha Oe! Sing another Line; Wood Violets; You're an old Smoothie; Lou'siana Lullaby; Goodnight, but not Goodbye; I always keep my girl out late; Avalon; It was a Night in June; Let the World go drifting by; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

**FLENSBURG**.—See Hamburg.

**FLORENCE**.—See Turin.

### FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—11.0 a.m., Gramophone Concert of Fantastic Music: Mephisto-Walzer (Liszt); Witches' Sabbath from the Fantastic Symphony (Berlioz); Das Hexenlied (Max von Schillings); L'apprenti sorcier (Dukas); Dance of the Witch from Pictures from an Exhibition (Mussorgsky); Prometheus—for Orchestra, Choir, Piano and Organ, Op. 60 (Scriabin). 12.15 p.m., Time and News. 12.25, Local News. 12.35, Concert. 1.30 to 1.40, Interval. 1.40, Recital of Folk Songs of the Romantic Period. 2.30, Weather Report. 2.40, Time and Exchange. 3.0, Orchestral Concert, conducted by Keller; Soloists: Prof. Julius Dahlke (Piano) and Dr. Erich Burger (Soprano to the Lute); Overture, Euristeo (Hasse); Two Intradas (Melchior Franck); Suite in A Minor (Telemann); Franconian Folk Songs to the Lute; Piano Solos: (a) Suite (Lully). (b) March and Ländler (Mozart). (c) Variations on a Theme of Glück (Hummel). (d) Aus dem Spaziergängen eines Einsamen (St. Heller). (e) Abendfantasie (Loewe); Bavarian Folk Songs to the Lute; Suite from Banchetto musicale (Schein); Concerto grosso in B flat (Handel). 5.0 to 5.35, See Stuttgart. 5.35, Talk: The Hitler Jugend. 5.50, Weather, News, Programme Announcements and Time Signal. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Topical Talk. 7.10, See Langenberg. 9.0, Time and News. 9.20, See Stuttgart. 9.30, Local News and Weather. 9.45, Light Music. 10.0, Serenade. 11.0, See Langenberg. 12 Midnight, Close Down.

**FREDRIKSSTAD**.—See Oslo.

**FREIBURG**.—See Stuttgart.

**GENEVA**.—See Radio-Suisse Romande.

**GENOA**.—See Turin.

**GLEIWITZ**.—See Breslau.

**GOTEBORG**.—See Stockholm.

**GRAZ**.—See Vienna.

**HAMAR**.—See Oslo.

### HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres; and Kiel, 1,292 kc/s, 232.2 metres.—5.0 p.m., Variety Programme. 5.20, Talk by Captain Moritz von Egidy; With S.M.S. Seydlitz in the Great War. 5.40, Frankfurt Exchange and Hamburg Market Prices. 5.50, Weather. 6.0, Transmission for all German Stations relayed from Munich. 7.0, Political Announcements. 7.10, Die Erlösten—Oratorio in Three Parts (Huth) for Soloists, Choir and Orchestra, relayed from the Nicolai-Kirche, Flensburg. 8.10, Der Schimmelreiter—Radio Play after the Novel by Theodor Storm (arr. Eugen Dittmer). 9.0, Time and News. 9.20 (from Kiel), Concert by the Kiel Orchestra of Unemployed Musicians, conducted by Hans Böring; March-Intermezzo, Der Zirkus kommt (Rust); Overture, Raymond (Thomas); Romance, Ein Traum (Jüttner); Selection from The Bartered Bride (Smetana); Intermezzo, Allein (Eilenberg); Selection from Eine einzige Nacht (Stolz); Telefon-Galopp (Lüling); Dämmerstündchen (Förster); Ballet Suite (Poppy); Traumwalzer (Müllacker); Japanese Dance, Tokasai (Helmburgh-Holmes); Fleury-Marsch (Firts). 10.0, See Hamburg.

### HEILSBURG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 to 1.30 p.m., Gramophone Concert of Operetta Music: Selection from Ritter Pasman (Joh. Strauss); Tenor Solo from Der Bettelstudent (Müllacker); Waltz from The Dollar Princess (Fall); Soprano Solo from Die Fledermaus (Joh. Strauss); Selection from Le Belle Hélène (Offenbach); Duet from Boaccaccio (Suppé); Selection from Der Obersteiger (Zeller); Selection from Casanova

(Joh. Strauss); Waltz from Eva (Lehár); Tenor Solo from The Mikado (Sullivan); Duet from The Gipsy Princess (Kühn); Selection from Rose Marie (Friml); Song from Lilac Time (Schubert-Berté); Selection from The Merry Widow (Lehár); Kind, du kannst tanzen from Die geschiedene Frau (Fall); Selection from Der liebe Augustin (Fall); March from The Merry Widow (Lehár). In the intervals at 12.20 and 1.0, News. 2.0, Market Prices. 2.30, Programme for Children. 3.0, Concert from Breslau. 4.30, Review of Books. 4.45, Sports Review. 5.15, Market Prices. 5.25, Talk: The Engravers of Old Danzig. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, News and Weather. 7.10, Martin Luther's Hymns in Settings by Old Masters; The Station Choir, conducted by Prof. Paul Firchow, with Ernst Beyer (Organ); Vater unser im Himmelreich—Organ Prelude (Pachelbel); Choral: Erhalt uns Herr bei Deinem Wort (Jeep); Organ Prelude, Mit Fried und Freud fuhr ich dahin (Prätorius); Choral: Verleih uns Frieden gnädiglich (Bartholomäus Gesinus); Organ Prelude, Vom Himmel hoch, da komm ich her (Gumpelheimer); Organ Prelude, Eine feste Burg ist unser Gott (Haser); Choral: Komm heiliger Geist, Herre Gott (Bach); Lob, Ehr und Dank sei Dir gesagt—from the Choral, Christus wir sollen loben schon (Bach); Fantasia in G Minor for Organ (Bach). 8.10, Gramophone Concert of German Opera Music: Overture, Das Christlein (Pfitzner); Song from Die Königskinder (Humperdinck); Selections from Undine (Lortzing); Melodies from Hansel and Gretel (Humperdinck). 9.0, News. 9.20, Elementary English Lesson.

### HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to 5.40 p.m. and 20 kW. from 5.40 p.m.—11.40 a.m. till Close Down, Programme of the Workers Radio Society (V.A.R.A.). 11.40, Concert by the V.A.R.A. Orchestra, conducted by de Groot: Vive le torcedor (Poppy); Sympathy (Mezzacapo); Das Blumenmädchen (Siede); The Gondolier (Powell); Wolgeister (Leuschner); Gramophone Records; Allegro (Filippucci); Serenade (Eilenberg); Forest Idylls (MacDowell); Moonlight on the Alster (Fétras); Gramophone Music; Extracts from Jeux d'enfants (Bizet); Mimet (Debussy); Airs de Ballet (Brigo); In the Sunny South (Rodewald-Lampe). 1.40 to 2.10, Interval. 2.10, Violin Duets (Mozart); Sonata in E minor and Sonata in F. 2.40, Recitations. 3.10, Gramophone Music. 4.10, Programme for Children. 4.40, Dance Music. In the interval, Gramophone Records. 6.10, Harpsichord Recital by Gertrude Wertheim with Commentary: Toccata in G (Swedlneck); Sonata in C (Haydn); Rigaudon with Variations (Rameau); Toccata in G (Bach). 6.50, Book Review. 7.10, Organ Recital by Young. Selection from Il Trovatore (Verdi); Serenade (Schmalstieg); Es führt kein anderer weg zur Seligkeit (Heymann); Harlequin (Erwin). 7.40, S.O.S. Messages. 7.42, News Bulletin. 7.55, Choral and Orchestral Concert relayed from Gröningen; Conductor: Knijpinga; March (Souza); Overture, Rienzi (Wagner); Songs: (a) Vespers (Beethoven). (b) Wohlseig die Toten (Mendelssohn). (c) Sunrise (Tancun); Goldner Walzer (Winter); Song: Künstlerleben (Strauss). 8.55, Concert by the V.A.R.A. Orchestra, conducted by de Groot: Overture, La chasse du jeune Henri (Méhul); Clarinet Concerto (Mozart); Prelude to Le Déluge (Saint-Saëns); Liebeswalzer (Regner); Czardas from Der Geist des Wojewoden (Grossmann). 9.40, Recitations. 9.55, Concert (contd.): Overture, Jeanne, Jeanette et Jeanette (Lacôme); Valse des brunnettes (Ganne); Tango (Filippucci); Three Dances from the Nell Gwynn Suite (German); Offenbach Potpourri (arr. Urbach). 10.40, Gramophone Music. 11.40 (approx.), Close Down.

**HORBY**.—See Stockholm.

### HUIZEN

160 kc/s, 1,875 metres; 7 kW until 3.40 p.m. Transmitted from Kootwijk on 50 kW. from 3.40 p.m. Programme by the Christian Radio Society (N.C.R.V.). 11.40 a.m., Police Notes. 11.55, Gramophone Music. 12.10 p.m., Organ Recital by Jean Zwart; Preludes and Chorales (Zwart); Movements from the Trio Sonatas (Bach); Psalm (arr. Zwart); Extracts from the Organ Concertos (Handel); Sacred Songs (arr. Zwart); Pieces from the Orgelschule (Rinck); Finale (Zwart). 1.40, Broadcast for Schools. 2.15, Horticultural Talk. 2.55, Dress-making Lesson. 3.25, Interval. 3.40, Bible Reading with Songs and Organ Solos. 4.40, Gramophone Music. 4.55, Organ Recital by Blaauw; Sacred Songs; Adagio (Beethoven); Liebesleid (Kreisler); Indischer Brantzug (Siede); Gramophone Records. Suite, Ein Fest im Gnomereich (Witteborn); The Garden of Lilies (Zwysen); Selection from Les Dragons de Villars (Maillart). 6.10, Answers to Correspondence. 6.40, Police Notes. 6.55, Religious News. 7.10, Answers to Correspondence (contd.). 7.40, Concert by the Bach Choir

of the Bethlehem Church, the Dutch Chamber Orchestra and Soloists: Cantata No. 80—Ein feste Burg (Bach); Two Arias from Cantatas (Bach); Aria from the Mass in B minor (Bach); Two Preludes and Chorals (Bach); Cantata No. 140, Sleepers Wake (Bach); Organ Concerto in F (Handel). In the interval at 8.40, Talk. 10.10, News. 10.20 (approx.), Gramophone Music. 11.10 (approx.), Close Down.

**INNSBRUCK**.—See Vienna.

### JUAN LES PINS

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, News, Financial Notes and Racing Results. 8.10, Sports Notes. 8.25, Light Music. 8.45, News and Weather. 9.0, Literary and Musical Programme.

**KALUNDBORG**.—See Copenhagen.

**KIEL**.—See Hamburg.

**KLAGENFURT**.—See Vienna.

**KOSICE**.—See Prague.

### LANGENBERG

635 kc/s, 473 metres; 60 kW.—12.25 p.m., News and Weather. 12.35, See Frankfurt. 1.30, Meat Market Prices. 2.0, Gramophone Music. 2.15, Talk: New Excavations near Milligen. 2.50, Exchange. 2.50, Political Announcement. 3.0, See Frankfurt. 5.0, See Stuttgart. 5.35, Talk: National Economy Day. 5.50, News. 6.0, Transmission for all German Stations relayed from Munich. 7.0, See Frankfurt. 7.10, Concert by the Station Orchestra, conducted by Kühn, the Station Choir conducted by Bremer, and the Station String Quartet; Soloist: Franz Wolf (Baritone); Symphony in D, No. 31 (Mozart); Heimat Kantate—for Baritone, Choir and Orchestra (Kaufmann); Piano-forte Quintet (Dvorak). 9.0, See Frankfurt. 9.20, See Stuttgart. 9.30, News, Symphonic Poem, Tasso (Liszt). 9.45 (approx.), to 11.0, See Frankfurt. 11.0, Richard Strauss Concert on Gramophone Records of the Berlin State Orchestra, conducted by the Composer. Two Duets from Arabella; Suite, Le Bourgeois Gentilhomme; Four Songs for Tenor: (a) Traum durch die Dämmerung, (b) Freundschaftliche Vision, (c) Ständchen, (d) Gaieté; Suite, Le Bourgeois Gentilhomme. 12 Midnight, Close Down.

**LAUSANNE**.—See Radio-Suisse Romande.

### LEIPZIG

770 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m., Concert by the Leipzig Instrumental Quartet: Kleiner Wiener Marsch (Kreisler); Synopation (Kreisler); Pieces (Tosti); (a) Invanto, (b) Ideale, (c) Abschied, (d) Serenata; Humoresque (Regner); Reigen (Regner); Schäferspiel (Herrmann); Abschied (Kühne); Verlassen (Scholz); Klage (Herrmann); Frühling (Mauder); Bries de mer (Leonevallo); Waltz, Im schönen Tal der Isar (Löhr); Italian Serenade (Schubert); Ballet Scene, Piazza del Popolo (Frederiksen); Tango, Farewell to Naples (Murzilli). In the interval, Weather and Time. 12.15 p.m., News. 12.30, Love and Death in Opera—Gramophone Concert: Mir ist so wunderbar and Er sterbe doch er soll erst wissen from Fidelio (Beethoven); Love Duet and Isolda's Death Song from Tristan and Isolde (Wagner); Celeste Aida and O terra, addio from Aida (Verdi); Two Tenor Songs from Cavalleria rusticana (Mascagni); One fine Day and Aria from Madame Butterfly (Puccini). 1.15, News. 1.30, Announcements. 1.40, Programme for Women. 2.15, Talk. 2.35, Market Prices. 3.0, See Breslau. 4.30, Reading of German Folk Tales. 4.50, Poetry Reading. 5.5, Harpsichord Pedalier Recital by Friedrich Höpner; Dutch Song, Ach du feiner Reiter (Scheidt); Trio Sonata in E flat (Bach); Partita on the Choral, Freu dich sehr o meine Seele (Böhm). 5.45, Economic Report and Announcements. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Humorous Recitations. 8.0, Concert by the Leipzig Symphony Orchestra, conducted by Hans Weisbach; Soloist: Mijla Nikisch (Piano-forte); Piano-forte Concerto No. 2 in A (Liszt); Dramatic Symphony (Respighi). 9.0, News. 10.0 (from Dresden), Serenade by the Pfleitzel Marko Orchestra; March, Mit Eichenlaub und Scherertel (von Blom); Overture, Prince Methusalem (Joh. Strauss); Serenade, Schön ist jeder Tag, den Du mir schenkst, Marie Luise (Meise); Waltz Potpourri, Die Walzer der Welt (Kolbecht); Indian Scene, Im heiligen Hain (Lindemann); Potpourri, Aus der Woche (Thiele); Flotte Postillione (Rathke); Zwergkönigs Leibgarde (Pretzsch); Florentine March (Fueki). 11.0 (approx.), Close Down.

**LINZ**.—See Vienna.

### LJUBLJANA

522 kc/s, 574.7 metres; 7 kW. 6.0 p.m., Gramophone Music. 6.30, Foreign Press Review. 7.0, Orchestral Concert, with Vocal and Accordion Duets. In an interval at 8.30, Weather and News. 10.0 (approx.), Close Down.

### LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW.—Czech Evening. 7.0, Symphony No. 5, from the New World (Dvorak), on Gramophone Records. 7.45, Oboe Sonata (Handel). 8.0, Czech Concert by the Radio Orchestra, conducted by Henri Pensis; Carnival Overture (Dvorak); Selection from Schwanda, the Piper (Weinberger); A Story (Suk); Symphonic Suite, My Country (Smetana). 8.50, News in French. 9.0, Concert by the Radio Orchestra; Overture, The Magic Flute (Mozart); Romance (Svendsen); Concert Waltz (Moszkowsky); Chromatic Gallop (Liszt). 9.35, Gramophone Music. 9.45, News in German. 9.55, Gramophone Music. 10.15, Dance Music.

### LYONS

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.40 p.m., Radio Gazette for Lyons and the South-East. 8.30, Chamber Music Concert: The Jean Gay Quartet, Alexandre Brinonov (Baritone) and André Lespès (Flute); Fantasia (Lejeune); Trio for Strings (Haydn); Andante and Scherzo (Roussel); Flute Quartet (Mozart); Two Movements from the Quartet (Tailleferré). Baritone Solos: (a) The Secret (Fauré), (b) Evening Song and Air (Moussorgsky), (c) Song (Respighi), (d) Persian Song (Rubinstein), (e) Song (Pohl). After the Concert, News.

### MADRID

ARANJUEZ, EAQ, 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Popular Concert. In the interval, Radio Chronicle. 11.35, Sports and Bull-fighting Notes. 11.40, Light Music. 12.0 Midnight to 12.30 a.m. (Tuesday), Programme in English by the I.B.C. Concert: The Blue Danube; Dream Waltz; Only a Rose; Capulito de Alheli; Black-eyed Susan Brown; Volga; Now I'm in love; Garlo Gitano. 12.30, I.B.C. Good-night Melody and Close Down.

### MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW. 7.0 p.m., Chimes, Exchange, Radio Journal and Dance Music. 8.15, Topical Review. 8.30 (approx.), Close Down.

**MALMO**.—See Stockholm.

**MILAN**.—See Turin.

### MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Plichta. 3.50, See Prague. 4.15, Talk: Equality of the Sexes. 4.25, See Prague. 5.5, Talk: The Gold Standard and Industry. 5.15, See Prague. 5.30, German Transmission: Scene from Judith (Heldob). 6.0, See Prague. 7.0, Concert of Light Music by the Station Orchestra, conducted by Musil. Suite (Tapp); Canzonetta (Friml); Monte Carlo Waltz from The Devil's Grandmother (Nedbal); Czech Humoresque (Roubal); Hunting Song (Bayer); March, Golden Prague (Kubín). 7.30, Play and Talks from Kosice. 1,022 kc/s, 293 metres. 8.0, See Bratislava. 9.0, See Prague. 9.15 (approx.), Close Down.

**MOTALA**.—See Stockholm.

**MUHLACKER**.—See Stuttgart.

### MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Orchestral Concert, conducted by Erich Kloss; Overture, Le roi Fa dit (Delibes); Wedding Scenes (Smetana); Selection from Lohengrin (Wagner); Swedish Sketches (Torsten); Suite, At the Circus (Lautenschläger); Ballet Music (Berlioz); Serenade from Fredericus Rex (Roland); Kärtniederemarsch (Seiffert). 4.45, Two Talks about Work for Young People. 5.5, Die Geigerin—A Cycle for Soprano and String Quartet (Lechthaler). 5.25, Review of Books. 5.45, Time, Weather and Agricultural Notes. 6.0, Transmission for all German Stations. Music by Contemporary Bavarian Composers. Concert by the Station Orchestra. Conductors: Karl List and Erich Kloss. 7.5, Sacred Concert, relayed from Coburg. 8.0, Bavarian Evening. 9.0, Austria. 9.20, Time and News. 10.0, Nocturne—Concert by the Small Station Orchestra, conducted by Erich Kloss. 11.0 (approx.), Close Down.

**NAPLES**.—See Rome.

**NOTODDEN**.—See Oslo.

### OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Chamber Music by the Radio Ensemble. 5.0, German Lesson. 5.30, Theatre Review. 6.0, Announcements. Weather and News. 6.30, Agricultural Talk. 7.0, Time Signal. 7.1, Soloist Concert, Jon Brodal (Violin), Bjarne Mathiesen (Songs), and Ager Mikkelson (Piano-forte); Songs: (a) Aurorella (Lammers), (b) Jeg lagde mig så sildig (arr. Signund Lie). Violin Solo: Sonata in D (Händel). Songs: (a) Sylfven (Sinding), (b) Det første møtes sådme (Grieg), (c) Spillemann (Grieg). Violin Solos: (a) Two Melodies (Bloch), (b) Slav Dance No. 2 (Dvorak-Kreisler); Caro mio

ben (Pappini). 7.45, Recitation. 8.10, Review of Politics. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Popular Spanish Music on Gramophone Records. 9.35 (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Notes, Tourist Talk, Agricultural Notes and Giornale Radio. 7.20, Gramophone Music. In an interval at 7.30, Time and Announcements. 7.45, Chamber Music by the Station Quartet. 9.0 (approx.), Gramophone Concert. 10.0, Giornale Radio.

**PARIS**

**EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 18 kW.** Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals).—5.45, Le Journal Parlé. 7.30, Orchestral Concert, conducted by Flament. Les violons de Monsieur de Conty (Wormser); Two Pieces (Laparra); Danze piemontesi (Sinigaglia); Badner Mädel (Kozjak). 8.0, News. 8.15, Concert (contd.). Piece en forme de Habanera (Ravel); Gopak (Moussorgsky); Danes des petites russiennes (Delmas); Aragonese (Falla); Doll Dance (Turina); Dance of The Sugar Plum Fairy (Tchaikovsky); Bourree fantasque (Chabrier); Waltz, Acclamations (Waldteufel); Quadrille (Strauss). 9.0 (approx.). Close Down.

**PARIS**

**POSTE PARISIEN; 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m.** Joyeuse marche and Bourree fantasque (Chabrier), on Gramophone Records. 7.15, Le Journal Parlé. 7.30, Jazz Music on Gramophone Records. 8.0, Talk on Aeronautics. 8.10, Gramophone Music. 8.15, Interval. 8.30, La revue du mois—by Max Regnier and his Company. 9.0, Interval. 9.15, Gramophone Music. 10.30, News.

**PARIS**

**RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m.** Physical Culture. 7.30, Weather and Physical Culture (contd.). 7.45, Gramophone Music. 8.0, News. 12 Noon, Gramophone Concert: March, C'est nous (Messier); Yaxa (Messier); Albert in his Repertoire; Selection from Desdè (Christine); Waltz Songs of 1900: (a) Anouresse (Berger), (b) Fascination (Marchetti), (c) Les fleurs que nous aimons (Crémieux), Quand l'amour meurt (Crémieux-Millandy); La valse bleue (Margis); Accordion Solos: (a) C'est près de sa femme qu'on est encore le mieux (Borel-Clerc), (b) Il suffit d'un sourire (Borel-Clerc), (c) J'ai deux amours (Scott), (d) Voulez-vous de la canne à sucre (Paddy); Selection from The Gipsy Princess (Kálmán); Xylophone and Concertina Solos: Songs by Dorin: (a) Les amies sont courtes, (b) Nos femmes, (c) Le Parisien; Reviens (Fragson-Christine); Tout doux... tout doux (Ventura); C'est malheureux d'être amoureux (Noble-Hely); Parlez moi d'amour (Lenoir); Chansons de France (Mistraki). In the intervals at 1.0 p.m., Exchange and News, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.20, Agricultural Talk. 6.45, Film Review. 7.0, Book Review. 7.20, Gramophone Concert: Prelude on a Popular Chinese Theme (Fortner); Autumn Song (Zouhalov); Waltz (Chopin-Aubert); Chante Rossignol, chante (Pijan); Catalana y Murciana (Nin); Two Hungarian Dances (Brahms). 7.45, Commercial Prices and News. 8.0, Gramophone Concert: Enregistrement (Pauley); Piliers d'Estaminet (Wicheler); Le plus beau jour (Wicheler); Ca c'est tout le midi (Maaricet-Varenne); Grock in his Music Hall Sketches; An Evening at the Theatre. 8.30, News. 8.40, Review by Reboux. 8.45, Chamber Music Concert: Soloists: Madeleine Barbureau (Sautem), Lucienne Radisse (Cello), Alys Lautemann (Harp), and Serge Tenenbaum (Violin): Concert Pieces for Harp, Violin and Cello (Rameau); Songs: (a) Rimes tendres (Aubert), (b) Fantoches (Debussy); Cello Solos: (a) Lamento (Fiorillo), (b) Goyescas (Granados), (c) El piano moruno (Falla), (d) Polo (Falla); Sonatina for Harp (Tournier); Songs: (a) Green (Debussy), (b) Sonnet de Ronsard (Caplet); Trio No. 2 (Schumann). In the interval at 9.15, Press Review and News.

**PITTSBURGH**

**KDKA, 980 kc/s, 306 metres; 50 kW.** Relayed by W8XK on 48.86 metres and 25.27 metres.—7.0 p.m., Musical Originalities, from New York. 7.30, KDKA Home Forum. 8.0, Programme to be announced. 8.15, Words and Music, from New York. 8.45, Human Values. 9.0, Betty and Bob, from New York. 9.15, Radio Guild, from New York. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, Press News Reeler. 11.15, Sports. Pat Haley. 11.30, Pittsburgh Spotlights. 11.45 to 3.0 a.m. (Tuesday), New York Relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15, Baby Rose Marie. 12.30, Variety Programme. 1.0, Sealed Power. 1.30, Potash and Perimutter. 1.45, Red Davis. 2.0, Sinclair Minstrels. 2.30, Melody Moments. 3.0, Silver Toppers.

**PORSGRUND.**—See Oslo.

OCT. 30th **MONDAY** continued

**PRAGUE**

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Moravská-Ostrava. 3.50, Programme for Children. 4.5, Gramophone Music. 4.15 Talk: October 30th, 1918, in Prague. 4.25, Gramophone Music. 4.35, English Lesson. 4.50, Gramophone Music. 5.5, Agricultural Report. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Songs. 6.0, Time and News. 6.10, Recitations. 6.40, Talk. 7.0, See Moravská-Ostrava. 7.30, Play and Talks from Kosice, 1,022 kc/s, 293 metres. 8.0, See Bratislava. 9.0, Time and News. 9.15, Talk in German. 9.30 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

**SOTTENS, 743 kc/s, 403 metres; 25 kW. and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m.** (from Lausanne). Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Geneva). Gramophone Music. 12 Noon (from Geneva). Financial News. 12.10 p.m. (from Geneva). Gramophone Music. 1.0 to 2.58, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0, See Schweizerischer Landessender. 5.0 (from Lausanne). Book-Keeping Lesson. 5.30 (from Lausanne). Programme for Children. 5.55 (from Lausanne). Italian Lesson. 6.20 (from Lausanne). Talk on Hygiene. 6.40 (from Lausanne). Legal Talk. 6.59, Weather. 7.0 (from Lausanne), Concert of Romanian Music by the Radio Lausanne Orchestra, conducted by Moser. Soloists: Mme. Pia Igy (Songs), Nicholas Vamasesco (Guitar) and Nicholas Caravia (Pianoforte). 7.50 (from Lausanne), Variety Programme. 9.0, News and Weather. 9.10 (from Geneva). Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

**REYKJAVIK**

250 kc/s, 1,200 metres; 21 kW.—11.0, Weather Forecast. 1.15 p.m., Variety Programme. 4.0, Weather Forecast. 8.10, Weather Forecast. 8.20, Light Music and Announcements. 9.0, Light Music. 9.30, Talk. 10.0, Time and News. 10.30, Popular Airs by the Radio Quartet and Vocal Solos.

**RJUKAN.**—See Oslo.

**ROME**

**Call IRO; 680 kc/s, 441 metres; 50 kW.** Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.40 p.m. (approx.); and 2RO, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—12 Noon, Gramophone Records of Opera and Variety Music. In the interval from 12.30 to 12.45 p.m., Giornale Radio and Exchange; and at 1.0, Time and Announcements. 1.15 to 3.30, Interval. 3.30, Children's Radio Review. 3.55, Giornale Radio and Exchange. 4.10, Weather. 4.15, Vocal and Instrumental Concert: Gina Schelini (Pianoforte), Maria Weillmaue (Soprano), and Guglielmo Bandini (Bass). Pianoforte Solos: (a) Romance, Op. 44 (Rubinstein), (b) March of the Dwarfs (Grieg); Mezzo-Soprano Solos: (a) Aria from The Secret Marriage (Cinarosa), (b) Aria from The Prophet (Meyerbeer); Pianoforte Solos: (a) Improvisation in E Flat (Schubert), (b) Cordoba (Albeniz); Aria and Duet from La Gioconda (Ponchielli). 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopolavoro Report and Tourist Information. 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Time, Announcements, and Gramophone Music. 7.30, Giornale Radio and Sports Notes. 7.40, See Bari. Talk in the interval. 8.30 (approx.), Concert of Light Music, conducted by Illuminato Calotta. 10.10, Giornale Radio.

**SALZBURG.**—See Vienna.

**SCHENECTADY**

**WGY, 790 kc/s, 379.5 metres; 50 kW.** Relayed at intervals by W2XAF on 31.48 metres, and by W2XAD on 19.56 metres.—7.30 p.m., Revolving Stage, from New York. 8.0, Health Hunters. Sketch. 8.15 to 8.30 (approx.). Soloist, from New York. 12.45 a.m. (Tuesday), Stock Reports. 1.0, News of the Day; Poetry; Historical Notes. 1.30 to 4.0, New York Relay. 1.30, Musical Programme. 2.0, A. and P. Gypsies. 2.30, Ship of Joy. 3.0, Contented Programme. 3.30, Jules Laude, Troubadour of the Violin. 4.0, Programme Resumé.

**SCHWEIZERISCHER LANDESENDER**

**BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m.** (from Berne). Gymnastics. 11.0 (from Basle). Popular Music on Gramophone Records. 11.29, Time Signal from Neuchâtel Observatory. Weather and News. 11.40 (from Basle). Wind Instrument Music on Gramophone Records. 12.25 p.m. (from Basle). Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Zürich),

Light Orchestral Concert. 3.0 (from Basle), Popular Songs and Tunes by Hanns van Loewen (Tenor) and the Radio Quartet. 4.10, Hungarian Music on Gramophone Records. 5.0 (from Basle), Programme for Children. 5.30 (from Zürich). Talk: Sculpture. 6.0, Time and Weather. 6.5 (from Zürich). Gramophone Music. 6.20 (from Zürich). English Lesson. 6.50 (from Zürich). Symphony Concert, relayed from the Tonhalle. 8.30 (approx.). Weather and News, followed by Concert by a Male Voice Choir (on Gramophone Records). 9.15 (approx.), Close Down.

**SOTTENS.**—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,328 metres; Östersund, 389 kc/s, 770 metres, and Sundsvall, 554 kc/s, 542 metres.—12 Noon to 12.30 p.m., Broadcast for schools. 4.5, Hawaiian Band Music. 4.30, The Practical Corner. 4.45, Gramophone Music. 5.45, Elementary German Lesson. 6.15, Weather and News. 6.30, Weather Report. 6.50, Introductory Talk to the following Transmission. 7.0, Don Carlos—Opera in Five Acts (Verdi). 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Music. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Gramophone Music. 2.0, Interval. 5.0, Orchestral Concert, conducted by Roskam: Russian March (Joh. Strauss); Waltz, Telegrammen (Joh. Strauss); Two Alsatian Sketches (Gross); Comedy Overture in French Style (Kéler-Béla); Selection from Hérodiade (Massenet); Air (Dreyer); Pianoforte Solo, Selection from The Dance of the Dragonflies (Lehár). 6.0, Fortnightly Literary Review. 6.15, Review of the Week. 6.30, Orchestral Concert, conducted by de Villers: Overture, Mozart (Hahn); Selection from Sylvia (Delibes); Tambourin chinois for Violin and Pianoforte (Kreislér); Norwegian Rhapsody (Svendsen); Selection from A Masked Ball (Verdi); Marche grecque (Ganne). 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Concert of Chamber Music by the Ferrari Trio: Trio all' Ungarése (Haydn); Trio Sonata (Lotti); Trio Sonata (Bocherini); Sinfonia du Camera (Porpora); Trio in D (Tartini); Concert Pieces for Cello and Pianoforte (Couperin); L'air and Mouvement de Danse (Teddoldi). 10.0, Press Review.

**STUTTGART**

**MUHLACKER, 832 kc/s, 360.5 metres; 60 kW.** Relayed by Freiburg, 827 kc/s, 570 metres.—12.25 p.m., Local News and Weather. 12.35, See Frankfurt. 1.30 to 2.10, Talk on Flowers. 2.30, Thuringia. 3.0, See Frankfurt. 5.0, French Lesson. 5.20, Talk: Journeys of Exploration in the Andes. 5.35, Talk: Poets, Writers and Men of Letters. 5.50, Time, Agricultural Notes and Weather. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, See Frankfurt. 7.10, See Langenberg. 9.0, See Munich. 9.20, Topical Talk. 9.30, Time and News. 9.45, Gramophone Music. 9.50, Local News, Weather and Sports Notes. 10.0, See Frankfurt. 11.0, See Langenberg. 12 Midnight, Close Down.

**SUNDSYALL.**—See Stockholm.

**TOULOUSE**

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Argentine Music. 6.30, Operetta Music. 6.45, Orchestral Music. 7.0, Songs. 7.30, Pianoforte Recital: Waltz in E Minor (Chopin); Rustle of Spring (Sinding); Hungarian Dance No. 5 (Brahms); Waltz (Mozzkovsky). 7.45, Operetta Music: Selection from The Bayadere (Kálmán); Selection from The Desert Song (Romberg); Napoléana from The Czarevitch (Lehár). 8.0, Opera Music: Duet from La Bohème (Puccini); Aria from Thais (Massenet); Duet from Tosca (Puccini). 8.15, Military Music. 8.30, Sound Film Music. 8.45, Accordion Music. 9.0, Concert by the Station Symphony Orchestra: Overture, Der Freischütz (Weber-Tavan); Bon-air Suzon (Lacôme); Selection from No. No, Napoléte (Youmans-Salabert); Suite, Les Pyrénées (Lacôme); Au bord du Nil (Gervasio); Selection from Werther (Massenet); Waltz, Gold and Silver (Lehár); Farewell of the Gladiators (Hankenburg). In the interval, Chansonnettes. 10.15, North African News. 10.30, Concert for Listeners in Morocco. 11.0, Request Music. 11.15, Dance Music. 12 Midnight, News, Weather and Announcements. 12.5 a.m. (Tuesday), Chansonnettes. 12.15, Orchestral Music: Sous la Feuillée (Thomé); Blonde amie (Carrel); O Frühling, wie bist du so schön (Lincke); Waltz, Les Sirenes (Waldteufel). 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

**TRONDHEIM.**—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Balalaika Concert from the Cabari di Milano. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolavoro Notes and Gramophone Music. 6.10, Agricultural Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, News. 7.15, Sponsored Concert. 8.15, A One-Act Comedy. 8.45, Chamber Music; Soloist: Arrigo Serato (Violin). 9.30, Gramophone Dance Music. 10.0, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning), and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15 a.m., Religious Information in Italian. 7.0 to 7.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer. 10.55, Weather. 11.0, Concert (contd.). March, Immer schneidig (Heinlein); Concert Polka for Two Piccolos, Die bieder Amseln (Assmann); Waltz, Sehnsucht nach Wien (Meyer-Helmund); Mein Liebster ist ein flotter Jägersmann (Niederberger); Violin Solo, Romance (Peters); Salamander (Wichtl); Habanera (Wichtl); Potpourri, Schlager auf Schlager (Gisser). 12 Noon, Time and News. 12.10 p.m., Gramophone Concert. 1.0, Interval. 2.0, Time and News. 2.20, Talk. 2.30, Gymnastics for Children. 2.55, Gustav Mahler Gramophone Concert. 3.55, Programme for Children. 4.0, Talk: Forty Years of Music in Austria. 4.25, Aria and Lieder Recital by Albert Feller (Tenor). 5.5, Talk on Botany. 5.25, Books and Publications in connection with the Week's Talks. 5.30, Elementary English Lesson. 5.50, Topical Talk. 6.0, Concert of Austrian Folk Songs by the Vienna Folk Song Society, with Introductory Talk. 6.50, Time and News. 7.0, Concert by the Symphony Orchestra of the Wiener Heimatschutzes, conducted by Dr. Philipp de la Cerda, relayed from the Konzerthausaal. Soloists: Margit Angerer (Soprano), Gunnar Graarud (Tenor), and Wolfgang Schneiderhan (Violin). Overture, Don Giovanni (Mozart); Symphony, No. 6 in F, Op. 68, The Pastoral (Beethoven); Violin Concerto (Paganini); Soprano Songs (Marx): (a) Und gestern hat er mir Rosen gebracht, (b) Venetian Cradle Song, (c) Selige Nacht; Symphonic Tone Picture, Romantic Night (Rinaldini); Tenor Solos (Wolf): (a) Verborgenhheit, (b) Der Freund; Three Tenor Solos from The Valkyrie (Wagner); Overture, Rienzi (Wagner). In the interval at 8.15, News. 9.30, Announcements. 9.40, Gramophone Concert. Announcements after the Programme.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Concert by the Post Office Mandoline Orchestra: Overture, Les mauvais tours de l'amour (Viche); Vienna, City of my dreams (Sieczynski); Extract from The Haunted Castle (Moniusko); Fleurs russes (Viche); Serenade Pygmées (Razigade); Réverie (Prisowski); Intermezzo (Werner-Kersten); Serenade (Tosti); Mazurka (Lowandowski). 11.30, Radio Journal. 11.35, Weather. 11.38, Concert (contd.). 12 Noon, Interval. 2.30, Economic Notes. 2.40, Tourist Report. 2.45, Aviation Report and Anti-Gas Drill. 2.55, Song Recital by Ada Horská: Je suis amoureux (Rachmani-nov); Love and the Maiden (Schubert); Oñ vatu (Szopski); Il dort au clair de lune (Karlowski); Clair de lune (Nievianowski). 3.10, Pianoforte Recital by Burkath: Prelude in B flat minor (Bach); Sonata in F sharp minor, Op. 27 (Beethoven); Romance in F sharp (Schumann); Nachtstück, No. 4 (Schumann); Ballad in A flat, Op. 47 (Chopin). 3.40, Elementary French Lesson. 3.55, Cello and Song Recital by Adamska and Lipowska: 'Cello Sonatas (Händel); 'Cello Solo, Les petits doigts (De Caix-D'Herveylois); Songs; 'Cello Solos: (a) Concert Polonaise (Popper), (b) Etude (Chopin-Glazunov), (c) Habanera (Ravel), (d) Neapolitan Song (Casella); Songs. 4.50, Agricultural Correspondence. 5.0, Talk: Poles in the United States. 5.25, Programme for the Festival of the Frontier Guards. 6.5, Miscellaneous Items. 6.25, Talk on Music, relayed from Lwów, 788 kc/s, 381 metres. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Lilli-Operetta in Three Acts (Rozkyé). In the interval, Talk: The Bulgarian Army of Labour. 9.30, Sports Notes. 9.40, Dance Music from the Gastronomica Restaurant. In the interval at 10.0, News, Weather and Police Notes.

**ZÜRICH.**—See Schweizerischer Landessender.

## ALGIERS

824 kc/s, 364 metres; 13 kW.—7.0 p.m., Financial Notes. 7.10, Shipping Notes. 7.15, Agricultural Notes and Weather. 7.20, Songs from Sound Films. 7.55, News. 8.0, Time Signal. 8.2, Lottery Results. 8.10, Sonata No. 2 for Violin and Piano (Beethoven). 8.30, News. 8.35, Russian Songs. 8.50, Music by a Hawaiian Orchestra: Valse troubadante (Bosc); Poème (Fibich). 9.0, Concert of Oriental Music. In an interval at 9.30, News. 9.55, News.

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations, and Gramophone Concert. 6.0, Programme for Children. 6.40, News. 7.0, Gaelic Reading. 7.15, Val Vouden. Entertainer. 7.30, Time Signal. 7.31, Old Dance Music by the Station Orchestra. 8.0, Dance Songs by G. Mortimer (Mezzo-Soprano). 8.15, Tango Tunes by the Station Orchestra. 8.30, Pianoforte Recital by Mary Braid. 8.45, Baritone Solos by Denis Cox. 9.0, A Sketch by M. Sheridan and Company. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Concert of Dance Music: Where are you now?; Sarita Tango; It's within your Power; Street of Dreams. 9.45, Concert of Dance Music: Looking Forward; In the Park in Patee; Plegania Tango; Jog along. 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities; Morgenblätter. Waltz (Strauss); Serenade (Heykens); Pearl O' Mine (Fletcher); Song, If I were King (Robin); L'ultima serenata (Toselli); Toymaker's Dream (Golder); Rosa Mia (Guizar). 10.30, Time, News, and Weather. 10.40, Variety Programme. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Selection from Siegfried (Wagner); Elegy (Vallaur); Italian Serenade (Holmes); Traumeri (Schumann); Norwegian Dance No. 3 (Grieg); Bells across the Meadow (Kettelby); Selection from Werther (Massenet). 7.0, Request Gramophone Records. 7.30, Exchange and Talk. 8.0, Request Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices. 9.5, Sponsored Programme. 9.30, Concert by the Radio Orchestra: March héroïque (Saint-Saëns); Spanish Dance (Fernandez); Persian Scenes (Rust); Invitation to the Waltz (Weber). 10.0, Talk. 10.15, Juame Palhissa Concert. The Station Symphony Orchestra, conducted by the Composer. In the interval at 11.0, News. 12 Midnight, Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—3.30 p.m., Light Music by the Radio Quintet. 3.55 to 5.0, See Rome. 5.35, News in Albanian. 5.45 (approx.) till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—3.0 p.m., Recital of Songs. 3.30, Gramophone Music. 4.0, German Lesson. 5.55, Time and Programme Announcements. 6.0, Recital of Songs. 6.30, Talk. 7.0, Violin Concerto (Bach). 7.40, Autumn—Concert by the Station Orchestra. 8.10, Popular Songs. 8.40, Gramophone Music. 9.0, Time, News and Cigány Music from the Rudnicanin Restaurant.

## BERLIN

DEUTSCHLANDSENDER (Reichssender). 188.5 kc/s, 1,635 metres; 60 kW.—11.5 a.m. (approx.), Gramophone Concert: Hunting Chorus from Der Freischütz (Weber); Sailors' Chorus from The Flying Dutchman (Wagner); Finale from the Second Act of Aida (Verdi); Aria from The Barber of Bagdad (Cornelius); Three German Dances (Haydn); Am Rhein (Humperdinck); Elegiac Melodies (Grieg); (a) Herzwunden, (b) Letzter Frühling; Ninna Nanna (de Micheli); Polka, Tritsch-Tratsch (Strauss); Hungarian Romance and Czardas (Sardor); Canzone d'amore (de Curtis); Matrosenstreich (Radtke). 11.55, Time Signal. 12.45 p.m., News. 1.0, Gramophone Concert: Overture, William Tell (Rossini); Mahnung (Hermann); Liebesfeier (Weingartner); Prelude (Järnefeldt); Witches' Ride and Witches' Gingerbread Waltz from Hansel and Gretel (Humperdinck); Selection from Cavalleria rusticana (Mascagni); Slav Folk Melodies, with Variations, from Coppélia (Delibes); Song and Czardas from The Gipsy Baron (Strauss); Selection from Tosca (Puccini); Roses from the South (Joh. Strauss); Wien wird bei Nacht erst schön (Stolz); Drum in der Lobau (Strecker). 2.0, Technical Talk for Young People. 2.30, Weather and Exchange. 2.45, Hunting Tales. 3.0, See Stuttgart. 4.0, Talk for Women. 4.20, String Quartet in C Sharp Minor, Op. 131 (Beethoven), by the Dresden String Quartet. 5.0, Poems. 5.5, Talk: The History of Art in Anecdote. 5.25, Political Press Review. 6.45, Weather and Announcements. 6.0, Transmission for all German Stations; Concert from the Parish Church, Wittenberg; Prelude and Fugue in C for Organ (Böhm); Choir: Allein auf Gottes Wort (Walther); Reading

(Luther); Choir: Erhalt uns Herr bei deinem Wort—with Organ Choral; Reading (Luther); Nun freut euch lieben Christen gmein; Reading (Luther); Christ, der du bist der helle Tag; Choral Taceta' Ein feste Burg. 7.0, Talk: The German National Safety Campaign. 7.10, Start-Berch—a Radio Play (Hermann Rossman). 8.30, Concert from the Grosser Saal der Neuen Welt; The Berlin Concert Society, conducted by Clemens Schalmstich; Soloist, Max Rohde (Baritone); Symphonic Poem, Les Préludes (Liszt); Wotan's Farewell and Fire Magic (Wagner); Overture, Tannhäuser (Wagner). 9.5, News. 9.45, Weather. 10.0, Concert from Hamburg. 11.0 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW.—3.0 p.m., Recital of Schubert Songs by Lucy Dimort (Contralto): Du bist die Ruh; Die Stadt; Abends am Strand; Tallisiane. 3.15, Talk: The Garden. 3.30, Concert of Light Music by Adam Brähler (Violin), Fritz Kleissatschek (Cello) and Rio Grebhardt (Pianoforte). Overture, Fest der Infantin (Gehhardt); Waltz, Over the Waves (Rosaspachernegg); Lyric Reverie (Bullerian); Japanese Suite (Yoshitomo); Der Eremit (Schmalstich); Ave Maria (Heykens); Violetta (Rust); Zigeunerfest (Heykens). 4.30, A Description of the Sinking of the Titanic, by one of the Survivors. 5.0, Debate: Do you still read Poetry? and Review of New Books of Poetry. 5.30, The Funkstunde informs its Listeners. . . 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.10, Lottery Announcements. 7.15, Programme of Dance Music by the Brother Walters' Dance Band, and the Herbert Hennig Dance Band, with Vocal Refrains. In the interval at 9.0, News. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMÜNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.35, News and Racing Results. 7.40, Programme for Women. 7.55, Lottery Results. 8.0, Topical Talk. 8.15, News. 8.30, Marie-Victoire—Play in Four Acts (Maeterlinck), relayed from Paris (Eiffel Tower).

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.45 p.m., Recital of Modern Czech Songs. 5.10, Concert by the Station Military Band: March (Knoch); Polka and Waltz (Hlora); Polka (Cermak); Two Pieces (Stolz); Polka (Pene); Slovak March (Vackar). 5.40, Lesson in Wireless Telegraphy. 5.55, Programme for Women. 6.0, See Prague. 7.40, Impressions—A Hungarian Comedy in One Act (Török). 8.0, See Prague. 9.15, See Brno. 10.0 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12 Noon, Weather. 12.5 p.m., Gramophone Concert. 12.45, Time and News. 1.10, Violin Recital by Adolf Wreege: First Movement from Sonata No. 5 (Beethoven); Romance (Svendesen); Souvenir (Drda); Old Folks at Home (arr. Kreisler); Andante (Massenet); Andante (Beucla). 1.40, Agricultural Prices. 2.0, Concert by the Station Orchestra, conducted by Rischka. In an interval at 3.0, Reading of Nazi Poetry. 4.30, Market Prices, followed by Topical Talk. 5.0, Talk: Luther's Struggle against the Church. 5.20, Organ Recital of Old Norwegian Music, relayed from the Nikolai Church, Brieg. 5.50, Market Prices. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, News. 7.10, Austrian Peasant Music by the Station Orchestra. 8.0, Talk: The Study of Folklore. 8.20, Programme for Peasants. 9.10, Time and News. 9.30, Political Press Review. 9.50, Talk on Social Service and Theatre Notes. 10.0, From Luther to Bach—Recital by Gottfried Richter (Harpisichord); Rudolf Vormung (Viola d'amore) and Fritz Binnowsky (Viola da gamba); The Elizabeth Psalm (Othmayr); Psalm No. 46; Psalm No. 51; Carmen (Agricola); Canzona (Gabrieli); Geistliches Lied (Walther); Song, Ich schwing mein Horn (Senn); Ich klag den Tag (Stolzer); Four Pieces (Gervaise); Capriccio for Harpsichord (Froberger); Suite for Viola da Gamba (Schenk); Sonata in D for Viola d'amore and Harpsichord (Ariosto); Toccata and Fugue for Harpsichord (Bach). 11.0 (approx.), Close Down.

## TUESDAY

OCTOBER THE THIRTY-FIRST

## BRNO

878 kc/s, 342 metres; 35 kW.—3.0 p.m., Concert by the Station Orchestra. 3.55, See Prague. 4.15, Talk on Chess. 4.35, See Prague. 5.15, Talk for Workers. 5.25, German Transmission: News, Talk on Alcohol, and Agricultural Talk. 6.0, See Prague. 6.10, Reading. 6.25, See Prague. 9.15, Concert of Chamber Music. 10.0 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Extracts from Aida—Opera (Verdi) on Gramophone Records. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Pierre Leemans. 5.0, Dance Music, relayed from the St. Saviour Palais de Danses. 6.0, Talk: The Folklore Museum in Anderlecht. 6.15, Gramophone Music: Extracts from the Fifth Symphony (Beethoven); Cavatine from The Queen of Sheba (Gounod); Theme and Variations from the Trio, Op. 50 (Tchaikovsky); Mazepa (Liszt). 7.15, Protestant Address. 7.30, Art Review and Talk for Women. 8.0, Concert by the Radio Orchestra, conducted by Charles Walpot. Soloist: René Durand (Tenor). Overture, Gillette de Narbonne (Audran); La Housarde (Ganne); Airs from The Desert Song (Kromberg); Jungle Drums (Kettelby); Fantasia-Ballet for Violin and Orchestra (de Bériot); Songs; March of the Grenadiers from The Love Parade (Scherzinger). 8.45, Gramophone Music. 9.0, Concert, relayed from the Century Hotel, Antwerp. 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—12 Noon, Concert by the Small Station Orchestra, conducted by Leemans. Soloist: Michot (Violin). 1.0, Journal Parlé. 1.10, Gramophone Concert. 5.0, Concert by the Radio Orchestra, conducted by Walpot. Soloist: M. Lombard (Xylophone); March, The Picador (Souza); Overture, Light Cavalry (Suppe); Gavotte, Au village (Gillet); Two Xylophone Solos; Juxed, from Moss et Vita (Gounod); Waltz, Schneeballen (Ziehrer); Jungle Drums (Kettelby). 5.45, Programme for Children. 6.30, Concert by the Small Station Orchestra, conducted by Leemans. Soloist: Wigy (Violin); Overture, Piccolino (Guiraud); Danza lirica (Escobar); Selection from Eugene Onegin (Tchaikovsky); Seseade for Violin (Drda); Hebrew Rhapsody (Manfred); Waltz from The Sleeping Beauty (Tchaikovsky). 7.0, Gramophone Records. 7.15, Talk: What is understood by the term, "Capitalism"? 7.30, Book Review. 8.0, Gramophone Concert: Polka, El Coreo (Corbin); Stephanie Gavotte (Czibulka); Mazurka, La Gitana (Ganne); Schottische (Cohen); Humorous Songs of 1860-1880; Polka (Bednar); Mazurka, Der Specht (Kahn); Waltz, Sphärenklänge (Jos. Strauss). After the Concert, Dramatic Programme. 9.0, Concert by the Radio Orchestra, conducted by Walpot, with Humorous Songs by Max Nabarro; Hungarian Overture (Keler-Bela); Selection from Tip Toes (Gershwin); Humorous Songs; Potpourri, Tempo, Tempo (Dostal). 10.0, Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Variety Concert by the Motoi Orchestra. In an interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Gramophone Music. 6.45, Talk. 7.0, Song Recital: Aria from Don Giovanni (Mozart); Aria from The Valkyrie (Wagner). 7.20, Orchestral Concert, conducted by Alessandresco: Prelude to Parsifal (Wagner); Concerto in D (Beethoven); Siegfried Idyll (Wagner); Overture, Euryanthe (Weber). In an interval at 8.0, Talk.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 7.0 p.m. till Close Down.—4.0 p.m., Concert by the Elemér Sárny (igány) Band. 4.30, Talk on Count Stefan Tisza. 5.0, Concert by the Budapest Concert Orchestra, conducted by Abrányi; Epic Suite (Abrányi); Trauerstimmen (Mosonyi); Reformation Symphony (Mendelssohn). 6.15, Programme by Nadányi and Julius Illyes. 7.0, A Radio Play. 8.45, Announcements. 9.0, Organ Recital by Geza Wehner, relayed from the Academy of Music; Prelude and Fugue in D minor (Bach); Intermezzo (Reger); March (Dubois); Ave Maria (Liszt); Scherzo (Widor); Fantasia on a Theme of Handel (Guilmans). 10.0, Concert by the Alexander Bura Cigány Band, relayed from the Metropolitan Hotel.

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time and Chimes from the Town Hall. 11.2, Concert by a String Ensemble, relayed from the Bellevue Strandhotel. 1.0 p.m., Interval. 1.40, Concert by the Radio Orchestra, conducted by Reesen. Overture, Vifandaka (Toft); Dance from Pharos's Ring (Rung); Bagpipes (Nielsen); Suite on Danish Folk Themes (Tarp); Overture, Little Christie (J. P. E. Hartmann); Interlude of Songs (Nielsen), sung by Thøger Rasmussen. Bolshevik March from Stephen (Hammerich); Waltz, Krolls Balklange (Lumbye); Albumblad (Gyldmark); Musical Comedy Selection. Paraphrase on Czech Folk Themes (Nielsen); Overture, Maskerade (Nielsen). 3.40, A Play for Children. 4.30, Exchange and Fish Market Prices. 4.45, Talk: Chamber Music. 5.15, German Lesson. 5.45, Weather. 5.54, Announcements. 6.0, News. 6.15, Time. 6.20, Talk on International Economy Day. 6.30, Wireless Notes. 7.0, Time. 7.1, Talk on Education. 7.15, Programme of Poetry, Songs and Folk Tunes from Jutland. 8.15, Rullebundslisken Play in Twelve Scenes (Segerlund). 8.45, Swedish Song Recital by Adele Weine, Varvang (Eklow); Three Songs (Peterson-Berger); Villemo (Rangström); Two Songs (Sjögern); Sommarloft (Alfven). 9.5, News. 9.20, Concert by the Radio Chamber Orchestra conducted by Mallor. Concerto grosso for Two Violins, Cello, String Orchestra and Harpsichord, in E Minor, Op. 3, No. 3 (Handel); Concerto, No. 6, in Sextet Form for Strings (Rameau); Capriccio for Strings (Vitali); Trio No. 8 in C Minor for Strings and Harpsichord (Stanitz). 10.10, Dance Music by the Thomsen Band, relayed from the National Scala. In the interval at 11.0, Time and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

## CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.20 p.m., Miscellaneous Items. 6.25, See Warsaw. In an interval at 6.40, Programme Announcements. 6.45, See Warsaw. 8.0, Literary Talk. 8.15, See Warsaw. In an interval at 9.0, Sports Notes. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 p.m. to 12 Noon, Programme in English by the I.B.C. Happy Hour. Part I, Light Music: Signature Tune; The Little Company (Gangleberger); The Busy Bee (Bendix); She's everybody's Sweetheart now (Harcreeves); Veleta Medley (Varney); Pianoforte Selection from Waltz Time (Strauss); Your Song of Paradise; My Lady Dainty (Hesse); The Enchanted Forest (Spain); Part II, Dance Music: Little Miss Muffet; Sadie the Shaker; I live for Love; Out in the Open; Sweetheart Darling; In Memory of you; I wanna count Sheep; My first Love to last; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0 p.m., Programme in English by the I.B.C. 4.30, The Nursery Corner. 5.0, Concert of Old Favourites for Torquay and Exeter Listeners: Signature Tune: The Night by the Sea; Minstrel Memories (Christy Minstrel Days); Yip-laddy-lay (Cobb and Flynn); Down at the Old Bull and Bush; After the Ball (Harris); The future Mrs.; Awkins knocked 'em in the Old Kent Road; The Old Rustic Bridge by the Mill (arr. Wood); Silver Threads among the Gold; Veterans of Variety. 5.30, Concert for Plymouth and Devonport Listeners: America Calling (Pola); Gambling Darkie (Torrani); High Hat (Alter); Dance of the Paper Dolls (Tueker); Signature Tune. 5.45, Concert: Here comes the Showboat (Rose); You're the Cream in my Coffee (Brown); Cowboy Joe; Selection from Hold my Hand (Gay). 6.0, Programme in French. 10.0 till Close Down, Programme in English by the I.B.C. 10.0 (approx.), Dance Music: Signature Tune: The Bells of Normandy; Egypt; Forever; Let's call it a Day; Sweet Dreams, Pretty Lady; Carry me back to green, green Pastures; A Girl like Nina; Lazybones; Wedding of the Dragon Foliage; Isn't it Heavenly?; Aloha Oe; Oh, Johanna; Don't blame me; My Moonlight Madonna; It's not a secret any more; Spanish Sweetheart; Won't you stay to Tea?; Happy as the Day is long; Signature Tune. 11.0, Orchestral Concert: Waltz, Love and Life in Vienna (Renard); Louisville Lady (Hill); There's something about a Soldier; Rhapsody in Blue (Gershwin); Selection from Give me a Ring (Broones); Song: Reflections in the Water (Leeb); Snowball (Carmichael); Destiny Waltz (Baynes). 11.30, Concert by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Signature Tune: Come back to Erin; Dance of the Sylphs (Berlioz); Rose mousse (Bosc); St. Patrick's Day (Brase); On the Edge of the Lake (Coates); Whispering Flowers (von Blon); Concert Waltz in D; Irish Song Medley; Rokozy March (Berlioz); Signature Tune: Come back to Erin. 12.5 a.m. (Wednesday), News Bulletin in English. 12.10 (approx.), Club Concert for

OCT. 31st **TUESDAY** continued

Wigan and Bolton Listeners: Signature Tune: The Chum Song; Sweetness (Emmer); To-day I feel so Happy (Abraham); The Old Man of the Mountains (Young); Crying and sighing (Neshitt); Trees (Rasbach); Louisiana Lullaby (Newman); Cornflowers and Poppies (Waldteufel); I've got to pass your House (Brown); Sophisticated Lady (Ellington); Come out Vienna (Herbert); I'll show you off (Hammerstein); Old Man Harlem (Vallee); Tick, Tock; Signature Tune. 1.0, Dance Music: Signature Tune: The Bells of Normandy; Avalon; Whistling under the Moon; Flor de Cuba; Isn't this a Night for Love?; Mademoiselle; Dance, pretty Lady; Hot Feet; Sing another Line; Then the Moon came out; 'Twixt the Devil and the Deep Blue Sea; Hold your Man; I always keep my Girl out late; Drifting down the Shalimar; Spanish Eyes; Learn to Croon; At the Old Pig and Whistle; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

**FLENSBURG.**—See Hamburg.

**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, Local News and Weather. 12.35, Gramophone Concert. Part I. German Music. Part II. Chamber Music. 1.30, Local News. 1.40, Talk for the Housewife. 2.30, Weather Report. 2.40, Time and Exchange. 3.0, See Stuttgart. 5.0, Italian Lesson. 5.20, Dialogue on Rationalisation. 5.35, Reading from the Works of Fritz Reck-Malezewen. 5.50, Weather, News, Exchange, Programme Announcements, and Time Signal. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.10, Concert of Light Music. 7.50, Topical Programme. 8.20, Chamber Music and Songs. 9.0, Time and News. 9.20, See Stuttgart. 9.30, Local News and Weather. 9.45 to 11.0, See Stuttgart. 11.0, Programme for All Souls' Day (Nov. 2nd). 11.45 (approx.), Close Down.

**FREDRIKSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, and Hanover, 1,319 kc/s, 227.4 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., See Leipzig. 4.0, Talk: Experiences as Commander of a Tank Corps. 4.15, Talk: The Work of the Sanitary Corps in the Great War. 4.30, Topical Programme. 4.55, Festival Service of the Reformed Church, relayed from Bremen Cathedral. 5.45, Frankfurt Exchange and Hamburg Market Prices. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.10, Luther Programme. 9.0, Time and News. 9.20, Concert by the Philharmonic Orchestra, conducted by Eibenschütz: Overture, Russian and Ludmilla (Glinka); Musik am Abend (Graener); Ballet Suite (Grétry-Franck); Sommerabend (Burgstaller); Two Pieces from the Intermezzi goldoniiani (Boschi); (a) Feierabend, (b) Serenade; Ein Waldspaziergang (Bühl); Selection from Paganiini (Lehár); Waltz, Nachtschwärmer (Zieler).

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—10.30 a.m., Concert by the Small Station Orchestra, conducted by Eugen Wilken. 12.5 p.m., Gramophone Concert of German Romantic Music. Part I—Weber. Jubel-Ouverture; Three Arias from Der Freischütz; Overture, Preciosa. Part II—Schumann. First Movement from the Pianoforte Concerto in A Minor; Songs: (a) Die Lotoslilie, (b) Der Nussbaum; Bass Solos: (a) Wanderlied, (b) Ich grolle nicht; First Movement from the Trio in D Minor. In the intervals at 12.20 and 10.40, News. 1.30, Programme arranged by the Post Office, with Gramophone Music. 2.0, Market Prices. 2.30, Programme for Children. 3.0, Concert by the Small Station Orchestra, conducted by Eugene Wilken: Overture, Die beiden Husaren (Doppler); Suite, Jeux d'enfants (Bizet); Selection from Das Dorf ohne Glocke (Künneke); Waltz, Gruss an Wien (Bausnern); Two Pieces (Sgambatti): (a) Serenata napoletana, (b) Gavotte; Bulgarian Folk Melody (Weninger); Potpourri, From A to Z (Geissler). In the interval at 3.15, Talk on Excursions. 4.35, Reading (Hermann Ludwig). 4.45, Review of Periodicals. 5.15, Market Prices. 5.25, Talk for Workers. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.10, News. 7.15 (from Danzig), Concert by the Dinuzig State Theatre Orchestra, conducted by Erich

Orthmann: Overture, Genevieve (Schumann); Scherzo (Pfitzner); Selection from Romeo and Juliet (Gounod); Selection from The Sleeping Beauty (Tchaikovsky); Paganini-Walzer (Joh. Strauss); Abenddämmerung am Meer (Niemann); Overture, Le Cheval de Bronze (Auber). 8.45 (from Danzig), Hans Grimm discusses the first production of his New Opera, Nicodemus. 9.0, News. 9.20, Political Press Review.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m., and 20 kW. from 5.40 p.m.—Programme of the German Broadcasting Company (A.V.R.O.). 10.10 a.m., Organ and Song Recital, by Piet van Egmond and Christina Alard. In the interval at 10.40, Talk on Cookery. 11.40, Time. 11.41, Concert of Light Music. In the interval, Barrel Organ Music. 1.55 p.m., Interval. 2.10, Gramophone Music. 2.40, Dressmaking Lesson. 3.40, Song and Pianoforte Recital by Bruno Ucke and Eghert Vecen. 4.10, Concert by a Children's Choir, conducted by Jacob Hamel. 4.40, Programme for Children. 5.10, Talk. 5.40, Concert by Cornelius Codolban and his Orchestra, relayed from the Carlton Hotel, Amsterdam. 6.10, Gramophone Music. 6.40, Concert of Light Music. 7.10, English Lesson. 7.40, Time Signal. 7.41, News. 7.45, Concert by the Station Orchestra, conducted by Albert van Raalte. Soloist: Edmée Favart (Songs). In the interval, Songs by The Singing Babies. 9.10, Luther—Radio Play (van Moerkerken). 9.45, Gramophone Music. 9.55, Songs by The Singing Babies. 10.10, Concert by the Station Orchestra, conducted by Nico Treep. 10.40, News. 10.50, Gramophone Music. 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. until 3.40 p.m. Transmitted from Kootwijk on 50 KW. from 3.40 p.m.—Programme of the Catholic Radio Society (K.R.O.). 11.55 a.m., Concert by the Vienna Station Octet. Selection from The Three Musketeers (Lenoir-Salabert); Je t'aime (Waldteufel); Overture, The Merry Wives of Windsor (Nicolaï); Das Zaubrield (Meyer-Helmund); Slav Rhapsody (Friedemann); Selection from Madame Butterfly (Puccini); Gramophone Music; Selection from Lilac Time (Schubert-Berté); Serenade (Tosti); Norwegian Rhapsody No. 3 (Svendsen); Finale. 1.40 p.m., Programme for Women. 2.40, Fashion Review. 3.10, Violin and Pianoforte Recital by Hartvelt and Bochart. Minuet (Scarlatti); Paghiera (Martini); Adagio (Bach); Andante with Variations (Mendelssohn); Nocturne in E flat (Chopin de Sarasate); Improprunt No. 2 Op. 9 (Schubert). 3.40, Interval. 3.55, Recital (contd.). Gipsy Serenade (Valdez); Mazurka (Zarzycki); Two Polish Dances (Scharwenka). 4.10, Gramophone Music. 4.25, Concert by the K.R.O. Boys. In an interval at 5.10, Gramophone Music. 6.20, Esperanto Lesson. 6.40, Police Announcements. 6.55, Religious Address. 7.10, Gramophone Music. 7.25, Talk. 7.40, Concert by the Fanfare Royal, conducted by Wiertz. Overture, Nebuchadnezzar (Verdi); Waltz, Reveries (Pamphile); Selection from Tannhäuser (Wagner); Selection from Der Freischütz (Weber-Dunkler); March of the Gladiators (Fucik). In the interval at 8.10 (approx.), News. 8.40, Gramophone Music. 8.50, Concert by the Station Orchestra, conducted by Gerritsen. Overture, Nordische Semfahrt (Gade); Bergliot (Grieg); Gavotte and Rhapsodie (Grieg); Midsummerkava (Alfven); Overture, Le Roi Pa dit (Delibes); Selection from Le Cid (Massenet); Sous les tilleuls (Massenet); Concert Waltz (Glasunov); Arab Dance (Tchaikovsky). In an interval at 9.40, Recitation. 10.40, Gramophone Music. 11.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide. Financial Notes, Racing Results, and News. 8.5, Agricultural Report. 8.10, English Lesson. 8.25, Radio Concert. In an interval at 8.45, News and Weather.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—11.0 a.m., Concert by the Station Orchestra, conducted by Kühn. Soloists: Walter Schneiderhan (Violin) and Hans Hauss (Pianoforte); Overture, The Taming of the Shrew (Götz); Violin Solo; Ave Maria (Gounod); Pianoforte Solo: Rigoletto—Paraphrase (Liszt); Suite from Sylvia (Delibes); Ballad and Polonaise (Vieuxtemps); March, Frisch drauf los (Blon). 12.15 p.m., See Frankfurt. 12.25, News and Weather. 12.35, See Frankfurt. 1.30, Agricultural Talk. 1.50, Chamber Music: Two Minnets (Sor); Pieces for Violin and Guitar (Schmidt-Kayser); An-

dantino (Guiliani). 2.5, Talk: Health Insurance. 2.16, Talk: German Museums. 2.30, Exchange. 2.50, Political Announcement. 3.0, See Stuttgart. 5.0 to 5.35, See Frankfurt. 5.35, Talk: Germany in the Past—Elizabeth Wautscherer. 5.50, News. 6.0, Transmission for all German Stations relayed from Berlin (Deutschlandsender). 7.0, See Berlin (Deutschlandsender). 7.10 to 9.20, See Frankfurt. 9.20, See Stuttgart. 9.30, News and Weather. 9.45 to 11.0, See Stuttgart. 11.0, See Frankfurt. 12 Midnight, Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m., Orchestral Concert, conducted by Hanns Ludwig Kormann: Overture (Thomas); Twelve German Dances (Haydn); Serenade in F. Op. 25 (Handke); Selection from Mona Lisa (Schillings); Valse romantique and Valse triste (Sibelius); Ballet Music from William Tell (Rossini); Overture, Zampa (Hérold); Waltz, Dolores (Waldteufel); Selection from Der Feldprediger (Müllöcker); Pierrot and Pierrette (Lehár); Romance in C (Kühnt); March, Freiheit! (Laukien). In an interval at 12.15 p.m., News. 1.0, News. 1.15, Interval. 2.0, Songs to the Lute, with Two Violins, by Walter Kretschmar, Herbert Gottschalk and Rudolf Wachtzar. 2.35, Market Prices and Exchange. 3.0, Concert by the Leipzig Symphony Orchestra, conducted by Theodor Bhmer. Soloist: Alfred Patzak (Cello): Overture, Zur Reformationsfeier (Reinecke); Extracts from the Symphony No. 73 (Haydn); Extracts from the Serenade for Twelve Wind Instruments (Berger); Cello Concerto in C. Op. 20 (d'Albert); Overture, Der Freischütz (Weber); Characteristic March in B minor, Op. 40, No. 3 (Schubert); German Dances (Beethoven). 4.30, Book Review. 4.50 (from Dresden): Sonata No. 2 in A (Arnold); for Zither. 5.30, Talk: Luther's Youth. 5.50, To-day's News. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, Talk: The National Defence League. 7.10, Religious Programme for the Reformation Festival, relayed from the Parish Church, Wittenberg. 7.40, Reading of Documents about Martin Luther. 8.0, Recital of Sacred Music by Lotte Wolf-Matthäus (Contralto) and Karl Hoyer (Organ). 9.0, News. 9.30, Football Results. 10.0, Orchestral Concert. 11.0 (approx.), Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—5.0 p.m., Programme for Children. 5.30, Gramophone Music. 6.0, French Lesson. 6.30, Talk on Yugoslavia. 7.0, Variety Concert. 8.30, Weather and News. 8.50, Dance Music. 9.30 to 10.0 p.m., Programme in English by the I.B.C.—International Broadcasting Club Concert: Wine, Woman and Song; Selection from White Horse Inn; Romance; I travel the Road; Roses from the South; Träumerei; Il Bacio; Blaze Away. 10.0 (approx.), Close Down.

**LUXEMBOURG**

352 kc/s, 1,191 metres; 200 kW.—Belgian Evening.—7.0, Concerto in G minor, Op. 22 (Saint-Saëns) on Gramophone Records. 7.30, Italian Song Recital by Mme. Marcia Nicolopolo; La Note (Puccini); Se tu n'ami (Pergolesi); Piacer d'amor (Martini); Resta in Pace (Cimarosa); Bel Nune (Cimarosa); Caro mio ben (Giordani); Sebben crudele (Caldara); O cessate di piagnami (Scarlatti); Pur dicesti (Lotti). 8.0, Talk for Housewives. 8.40, Concert by the Radio Orchestra, conducted by Henri Pensis. Les Néroides (Brusselmanns); Poème élégiaque (Jonzen); Pensee d'autonime (Jonzen); Suite orientale (Mawet); Cello Solo: Poème No. 2 (Vreuls). 8.50, News in French. 9.0, Concert by the Radio Orchestra, conducted by Pensis. Overture, Ruy Blas (Mendelssohn); Selection from I Pagliacci (Leoncavallo); Cello Solo with Orchestral Accompaniment: (a) Souvenir (Desprez), (b) Poème élégiaque (Desprez); Selection from Die Fledermaus (Johann Strauss). 9.45, News in German. 9.55, Gramophone Records. Selection from: (a) The Merry Widow (Lehár), (b) Paganiini (Lehár). 10.15, Dance Music on Gramophone Records.

**LYONS**

LA DOUA; 644 kc/s, 465.8 metres; 1.5 kW.—6.15 p.m., Radio Journal. 7.30, Gramophone Music. 7.40, Radio Gazette for Lyons and the South-East. 8.30, Marie Victoire—Play in Four Acts (Maeterlinck), relayed from Paris (Eiffel Tower). After the Programme, News.

**MADRID**

ARANJUEZ (EAQ) 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Concert of Popular Music. In the interval at 10.45, Radio Chronicle. 11.35, Spanish-American Talk. 11.45, Light Music. 12 Midnight to 12.30

a.m. (Wednesday), Programme in English by the I.B.C. Concert: The Skaters' Waltz; I love you; Butterflies in the Rain; Flower of Hawaii; Oh! Sailor Behave; Selection from Viktoria and her Hussar; Fiesta; The Blue Danube. 12.30, I.B.C. Goodnight Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Radio Journal and Request Gramophone Records. 7.30, Talk by Joaquin España Cantos and Request Gramophone Records (contd.). 8.15, Topical Review. 8.30 to 9.15, Interval. 9.15, English Lesson. 9.30, (Chimes, Time and Topical Review. 9.45 (approx.), A Musical Comedy. 11.45, Topical Review. 12 Midnight, Chimes. 1.0 to 2.0 a.m. (Wednesday), Programme in English by the I.B.C. Popular Music: Heading for a Wedding (Adamson); Scotch Hot (Whitlock); I raised my Hat (Pola); Reflections in the Water (Loeb); Cuckoo on the Clock (Collins); Waltz, Si petite (Gaston); If you'll say Yes, Chérie (Noble); It's Sunday down in Caroline (Symes); There's something about a Soldier (Gay); Whistling under the Moon (Ewing); Selection of Haydn Wood's Songs; Happy as the Day is Long (Arlen); Bom da-Diddy-Bom-Bom (Evans); The Grass is getting greener all the time (Newman); A Perfect Day (Jacobi-Bond); Sittin' in the Dark (Greer). 2.0, I.B.C. Goodnight Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—5.15 p.m., See Prague. 9.15, See Brno. 10.0 (approx.), Close Down.

**MDTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Orchestral Concert, conducted by Erich Kloss: Overture, The Siego of Corinth (Rossini); Cello Solos: (a) Le Cygne (Saint-Saëns), (b) Minuet (Becker); Selection from Madame Butterfly (Puccini); Intermezzo from Graziella (Matuschek); Waltz, Roses from the South (Joh. Strauss); Romantie Suite, Schloss Durande (Niemann); Zingaresca (Monti); Russian Mazurka (Glinka). 4.45, Talk: The Worker under the New Régime. 5.5 (from Nürnberg), Recital of Pianoforte Duets; Andante in G with Variations (Mozart); Three Pieces, Op. 85 (Schumann); Fantasia in F Minor, Op. 102 (Schubert). 5.25, Talk: Youth and the Skilled Trades. 5.45, Time, Weather and Market Prices. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.0, Through Distant Lands—Concert by the Small Station Orchestra, conducted by Erich Kloss; Soloist: Elisabeth Holzbauer (Contralto). 8.0, Concert from Leipzig. 9.0, Time and News.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Orchestral Concert, relayed from the Lyche Restaurant: Waltz, Donauweibchen (Strauss); L'heure tendre (Lempers); Overture, Morning, Noon and Night (Suppé); German Dances (Schubert); Selection from The Huguenots (Meyerbeer); Serenade (Carosio); Selection from The Tales of Hoffmann (Offenbach); Czardas (Grossmann). 5.0, Programme for Women. 5.45, Accordion Solos. 6.0, Announcements, Weather, and News. 6.30, English Lesson. 7.0, Time Signal. 7.1, Concert by the Station Orchestra, conducted by Kramm: Overture humorous (Weingartner); Circus Pictures (Pauline Hall); Symphonic Poem, Les Préludes (Liszt); Ballet Music from Swan Lake (Tchaikovsky); The Bayadere (Wingard); Three Pieces (Grainger): (a) London-derry Air, (b) Mock Morris, (c) Colonial Song; Romanian Dance (Bela Bartok). 8.10, Literary Review. 8.40, Weather and News. 9.0, Topical Talk. 9.15 (from Fredrikstad), Accordion Music. 9.45 (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Notes, Tourist Talk, Agricultural Report and Giornale Radio. 7.20, Gramophone Music. In an interval at 7.30, Time and Announcements. 7.45, Le Joueur de Notre-Dame—Opera in Three Acts (Massenet). In the intervals, Talk and Announcements. After the Opera, Giornale Radio.

**PARIS**

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals).—5.45 p.m., Le Journal Parlé. 8.30, Marie Victoire—Play in Four Acts (Maeterlinck).

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 50 kW.—7.0 p.m., Portuguese Music on Gramophone Records. 7.5, A Short Sound Film. 7.15, Le Journal Parlé. 7.30, Wind Instrument Concert. 8.0, Talk: The Music Hall. 8.5, Talk: The Cinema. 8.15, Interval. 8.30, Concert by the Station Orchestra: Overture, Phédre (Massenet); Kaiserwalzer (Joh. Strauss); La Hayanaise, for Violin and Orchestra (Saint-Saëns); Sérénade carnavalesque (Erlanger); Suite, Dolly (Fauré); Ballet Music from Antar (Dupont); Petite Suite (Roger-Ducasse); La Légende du point d'Argentan (Fourdrain); Wedding Cake (Saint-Saëns); Fête orientale (Weksler). 10.30, News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture (contd.). 7.45, Gramophone Music. 8.0, News. 12 Noon, Wagner Concert on Gramophone Records: Extracts from The Flying Dutchman, Lohengrin, Tannhäuser, Tristan and Isolde, The Mastersingers, The Rheingold, The Valkyrie, Siegfried, The Twilight of the Gods and Parsifal. In the intervals at 1.0 p.m., Exchange and News, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 4.30, Elementary English Lesson. 6.20, Agricultural Talk. 6.45, Gramophone Music: Souvenir de Rouen (Blondin); Moonlight on the Danube (Cay); Entry March of the Gladiators (Fueik-Wittmann); Selection from Les Saltimbanques (Ganne). 7.0, Theatre Notes. 7.20, Gramophone Concert: Selection from The Czarevitch (Lehár); Song (Perez); Liebesfrend (Kreisler); Ninon (Fosti); The Musical Box and the Pianola (Antiga). 7.45, Review of the Anglo-Saxon Press. 8.0, Gramophone Concert: Airs de Ballets from Placé (Rameau); Gigue for Harpsichord (Lully); Aria from Castor and Pollux (Rameau); Rigaudon from Dardanus (Rameau). 8.15, Review by Dominique Bonnaud. 8.30, Marie-Victoire—Play in Four Acts (Maeterlinck). In the interval at 9.15, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.86 metres and 25.27 metres.—7.0 p.m., Musical Originalities, from New York. 7.30, KDKA Home Forum. 8.0, Programme to be announced. 8.15, Words and Music, from New York. 8.45, Congress of Clubs. 9.0, Betty and Bob, from New York. 9.15, Meredith Wilson's Orchestra, from New York. 9.30, News, Markets. 9.45, Talk, from New York. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News, Piano Classique. 11.30, Pittsburgh Spotlights. 11.45 to 12.30 a.m. (Wednesday), New York Relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15, Marvellous Melodies. 12.30, Programme to be announced. 12.45 to 2.30, New York Relay. 12.45, Carney's Dog Stories. 1.0, Crime Clues. 1.30, Adventures in Health. 1.45, Trade and Mark. 2.0, Musical Memories. 2.30, Programme to be announced. 3.0, Ortiz Tirado, from New York.

PORSGRUND.—See Oslo.

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Brno. 3.55, Programme for Children. 4.15, Talk on Economics. 4.25, Gramophone Music. 4.35, German Lesson. 4.50, Gramophone Music. 5.5, Market Prices. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Talk on International Saving Day and Reading from his own Works by Richard Katz. 6.0, Time and News. 6.10, Talk on Astronomy. 6.25, Military Band Concert: March, The Hussites (Fueik); Overture, Robert le Diable (Meyerbeer); Bugle Horn Solo (Macek); Potpourri, Yugoslavian Pearls (Leopold); Ballet Music from The Two Widows (Smetana); Angels from Scènes pittoresques (Massenet); Czechoslovakian Song Potpourri (Soukup); Sokol March (Pesta). 7.25, Talk on Music. 7.40, Recital of Yugoslavian Folk Songs. 8.0, Concert by the Station Orchestra, conducted by Otakar Jeremias; Soloist, Colette Frantz (Violin); Symphonic Poem, Le Chasseur maudit (Franek); Violin Concerto (Milhaud); Hayanaise for Violin (Saint-Saëns); Symphonic Poem, The Little Dove (Dvorák). 9.0, Time and News. 9.15, See Brno. 10.0 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres, 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics. 9.0 (from Lausanne), Ordination Ceremony, relayed from the Cathedral. 10.30 (approx.) to 11.28, Interval. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Geneva), Extracts from the Peer Gunt Suite (Grieg). 12 Noon (from Geneva), Financial News. 12.10 p.m. (from Geneva), Gramophone Music. 1.0 to 2.58, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0 (from Lausanne), Concert by the Small Radio Lausanne Or-

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chestra. 5.0 (from Lausanne), Talk for Women. 5.30 (from Lausanne), Talk: The Thriller and the Crook Play. 5.55 (from Lausanne), German Lesson. 6.20 (from Lausanne), Talk: All Saints' Day. 6.40 (from Lausanne), Swiss Week—Talk. 6.59 (from Lausanne), Weather. 7.0 (from Lausanne), Chamber Music by the Milan Trio: Sonata (Bocherini); Cello Solos: (a) Aria (Bach), (b) Habanera (Ravel), (c) Canto amoroso (Sammartini), (d) Spinning Song (Popper); Trio in C (Brahms). 7.50 (from Lausanne), Cabaret Programme. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (from Lausanne), Dance Music. 10.0 (approx.), Close Down.

RJUKAN.—See Oslo.

ROME

Call 1R0, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.50 p.m. (approx.) and 2R0, 11,810 kc/s, 25.4 metres from 4.15 p.m.—11.30 a.m., Gramophone Music. 12 Noon to 1.15 p.m., Concert from Turin. In the interval from 12.30 to 12.45, Giornale Radio and Exchange and at 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, giornale and Exchange. 4.10, Weather. 4.15 to 5.0, Orchestral Concert of Light Music. 5.40 (Naples), Shipping and Sports Notes. 5.45, Morse Signals and 6.0, Tourist Report. 6.10, Wheat Market Report. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time and Announcements. 7.15, Request Music. 7.30, Sports Notes. 7.50, Talk on the following transmission. 8.0, Cosaresca—Musical Play (Pasquale la Rotella), relayed from the Argentina Theatre. Conductor: The Composer. In the intervals: Talk and Literary Notes. Giornale Radio after the Opera.

SALZBURG.—See Vienna.

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—12.45 a.m. (Wednesday), Stock Reports. 1.0 to 4.0, New York Relay. 1.0, Blackstone Plantation. 1.30, Wayne King's Orchestra. 2.0, Ben Bernie's Orchestra. 2.30, Fire Chief Programme. 3.0, Live at Stake, Sketch and Orchestra. 3.30, Madame Sylvia of Hollywood. 3.45, Robert Simmons, Tenor, and Orchestra. 4.0, Programme Resumé.

SCHWEIZERISCHER

LANDESENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Bern, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Bern), Gymnastics. 9.20 (from Bern), Broadcast for Schools. 9.50 to 11.0, Interval. 11.0 (from Zurich), Light Orchestral Music with Items by the Langiro Hot Players. 12.25 p.m. (from Zurich), Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Zurich), Concert by the Small Station Orchestra, conducted by Scherbaum. 3.0, See Radio-Suisse Romande. 5.0 (from Bern), Light Music on Gramophone Records. 5.30 (from Bern), Programme for Young People. 6.0 (from Bern), Time, Weather and Notes on the Broadcast for Schools. 6.10 (from Bern), Talk: Sunday Excursions. 6.20 (from Bern), Recital on Two Pianos. 6.45 (from Bern), Concert. 8.0, Weather and News. 8.10 (from Bern), Swiss Week—Schwarzbürg Dialect Programme. 9.30 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Östersund, 389 kc/s, 770 metres, and Sundsvall, 554 kc/s, 542 metres.—1.45 to 2.10 p.m., Broadcast for Schools, relayed from Jönköping, 1,490 kc/s, 201.3 metres. 4.5 p.m. (Göteborg), Programme for Children. 4.30, Reading. 5.0, Gramophone Music. 5.45, Elementary French Lesson. 6.15, Weather and News. 6.30, Talk on Economics. 7.0, Concert by the Station Orchestra, conducted by Adolf Wiklund. Soloist: Ingrid Kjellström-Stenbäck (Harpsichord); Symphony in B flat No. 2 (Schubert); Harpsichord Concerto in B flat (Chr. Bach); Elegy (Alfvén); Scherzo (Gunnar Ek). 8.0, Talk on Economics. 8.15, Recital by Charles Barkel (Violin) and Algot Haquinus (Piano); Violin Solos: Prandinum and Allegro (Pugnani-Kreisler); Piano-forte Solos: (a) Les collines d'Anacapri (Debussy), (b) Gadiz (Albeniz), (c) Autumn (Moszkovsky); Violin Solos: improvisation (Rangström); (b) Waltz Caprice (Wieniawski). 8.45, Weather and News. 9.0, Gramophone Music. 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Music. 12 Noon, Messenger Concert, conducted by de Villers. Suite funambulesque; Extracts from Madame Chrysanthe; Suite from Scaramouche; Ballet Music from Isoline. 12.45 p.m., News. 1.0, Time and Exchange. 1.5, Orchestral Concert, conducted by Roskam. 2.0, Interval. 4.45, Talk on the Colonies: Intellectual and Religious Life in Algiers. 5.0, Orchestral Concert, conducted by Roskam. March, Piccadilly (Benoit); De fil en aiguille (Gillet); Waltz (Fetras); Overture, Der Walfenschmid (Lortzing); Selection from Robert le Diable (Meyerbeer); Italian Serenade (Manfred); Intermezzo, Einzug der Rosenkönigin (Rhode); Selection from Les Mousquetaires au Couvent (Varney). 6.0, Talk: The Origin of the Gothic Style. 6.15, Talk: Topical Problems. 6.30, Orchestral Concert, conducted by de Villers. Overture, Le lac des fées (Anber); La jennesse d'Hercule (Saint-Saëns); Selection from Manon (Massenet); Three Norwegian Dances (Grieg); Persian Dance (Guiraud). 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German. Lottery Results and Announcements. 8.30, On ne badine pas avec l'amour—Play (de Musset), with incidental Music by Saint-Saëns, relayed from Paris. 10.30 (approx.), Press Review.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.25 p.m., Local News and Weather. 12.35 to 1.20, See Frankfurt. 3.0, Concert by the Station Orchestra, conducted by Gustav Gürlich; Soloists: Artur Haagen and Otto Seyfert (Piano-forte) and the Windisch Accordion Trio; Overture, Titus (Mozart); Pieces for two Piano-fortes; Suite, The Minstrels (Amadei); Pieces for two Piano-fortes; Selection from Hansel and Gretel (Humperdinck); March, Hoch Württemberg (Windisch); Waltz, Gruss vom Neckarstrand (Müllacker); Accordion Trio: (a) Im Reussal blüht wieder die Bäume, (b) Gruss aus Esslingen (Windisch); Swabian Rhapsody (Kämpfert); Waltz for Accordion Trio, Schwabenklänge (Windisch); Swabian Peasant Dance; Accordion Trio, Stuttgart Bonbons (Windisch); March (Unrat). 5.0 to 5.35, See Frankfurt. 5.35, Talk on Gardening. 5.50, Time, Market Prices, and Weather. 6.0, Transmission for all German Stations, relayed from Berlin (Deutschlandsender). 7.10 to 9.20, See Frankfurt. 9.20, Topical Talk. 9.30, Local News, Weather, and Sports Notes. 9.45, Gramophone Music. 10.0, Variety Programme by the Station Orchestra, conducted by Gustav Gürlich, with Instrument Solos. 11.0, See Frankfurt. 12.45 a.m. (approx.) (Wednesday), Close Down.

SUNDSVALL.—See Stockholm.

TOULOUSE

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Songs. 6.30, Viennese Music. 7.0, Opera Music: The Magic Flute from Schéhérazade (Ravel); Aria, Philémon et Baucis (Gounod); Tyrolienne from William Tell (Rossini); Aria from The Mastersingers (Wagner). 7.15, News, Racing Results and Market Prices. 7.30, Impressions d'Italie (Charpentier) by the Station Symphony Orchestra. 7.45, Accordion Music. 8.0, Military Music. 8.15, Airs from Opéra-Comique. 8.30, Concert by the Symphony Orchestra: Petite Suite de Concert (Coleridge-Taylor); Slav Rhapsody (Friedemann); Dances from Henry VIII (German); Introduction to The Golden Cockerel (Rimsky-Korsakov); Humoresque (Dvorák); Hindu Song (Rimsky-Korsakov). 9.0, Music Hall Programme. 9.30, Operetta Music: Selection from La Cocardie de Mimi Pinson (Gublier); Selection from Un Soir de Réveillon (Moretti); Waltz from The Gipsy Baron (Jos. Strauss); Air from The Czarevitch (Lehár). 9.45, Sound Film Music. 10.0, Bal-musette Music. 10.15, North African News. 10.30, Concert of Military Music and Songs for Listeners in Morocco. 11.0, Light Music. 11.15, Dance Music. 12 Midnight, News, Weather and Announcements. 12.5 a.m. (Wednesday), Argentine Music. 12.15, Orchestral Music: Welsh Rhapsody (German); The Three Bears (Coates). 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m. till Close Down, See Turin.

TRONDHEIM.—See Oslo.

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Dance Music. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Popolavoro Notes and Gramophone Music. 6.0, Time, Report of the Royal Geographical Society and Gramophone Music. 6.10, Agri-

cultural Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Giornale Radio and Weather. 8.0, Donna Lombarda—Opera in Two Acts (Cicognini) and Gianni Schicchi—Opera in One Act (Puccini), relayed from the Victor Emmanuel Theatre. In the intervals, Talk and Art Notes. 10.0, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning); and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15 a.m., Religious Information in English. 7.0 to 7.15 p.m., Religious Information in Italian.

VIENNA

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m., Concert by the Wiener Symphoniker, conducted by Josef Holzer. Italian Comedy Overture (Stix); Tone Poem, Königin Luise in Paretz (Leuschner); Waltz, Kontroversen (Joh. Strauss); Song, Klaunderwäsche (Weingartner); Mazurka, Kujawiak (Wieniawski); Selection from The Dance of the Dragonflies (Lehár); March, Die Türken vor Wien (Reiterer); Gavotte from Das Musikantenmädle (Jarno); Intermezzo from Das Herrgottshied (Krausz); Waltz, My Dream (Waldteufel); Song, Eine hat dich lieb (Katscher); Italian Capriccio, Mariette-Coquette (Anclife); Song, Eins, zwei, drei, mein Liebster ist ein Schneiderlein (Föderl); Potpourri (Chi). 1.0, Interval. 2.0, Time and News. 2.20, Talk: Photography. 2.30, Programme for Children. 2.55, Symphony No. 3 in F, Op. 90 (Brahms), by the Philadelphia Symphony Orchestra, conducted by Leopold Stokowski (on Gramophone Records). 3.35, Handwork for Children. 4.5, Talk: Cycling in Austria. 4.25, Pianoforte Recital by Emmy Zopf: Prelude and Fugue in G, and Prelude and Fugue in F minor, from the Wohltemperierten Klavier (Bach); Pianoforte Sonata in F sharp, Op. 87 (Beethoven); Pieces (Regér): (a) Intermezzo in E flat minor, Op. 15, (b) Humoresque in C, Op. 82, (c) Zwei Episoden, in D and C, Op. 115, (d) Silhouette in F sharp, Op. 53, (e) Waltz in E, 5.5, Talk on Aeroplanes: The Rocket. 5.35, Elementary French Lesson. 6.0, Concert by the Wiener Symphoniker, conducted by Josef Holzer and the Mandl Quartet. Soloists: Grete Holm (Songs) and Adalbert Vesely (Zitler). In the interval at 6.35, News. 7.15, Topical Talk. 7.30, In German Forests—Concert by the Wiener Symphoniker, conducted by Oswald Kabasta. Soloists: Lilli Claus (Soprano), Hedy Renda (Soprano), Dora With (Mezzo-Soprano), Margit Würll (Contralto), and Josef Kalenberg (Tenor); Extracts from Die Rose vom Liebesgarten (Pfützner); Extracts from Hansel and Gretel (Humperdinck); Extracts from The Valkyrie (Wagner); Extracts from Siegfried (Wagner); Extracts from Die versunkene Glocke (Zöllner); Overture, Der Freischütz (Weber). 9.0, News. 9.15, Music by the Four Funny Fellows, relayed from the Base. After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Fanfare from St. Mary's Church, Cracow. 11.5, Music from Revue on Gramophone Records. 11.30, Radio Journal. 11.35, Weather. 11.38, The Quartets of Beethoven on Gramophone Records. 12 Noon, Interval. 2.30 p.m., Economic Notes. 2.40, Violin Recital by Szttylic. Caprice (Paganini); Hebrew Melodies (Auer); Satyr and Dryads (Zolt); Paraphrase on Themes from Carmen (Bizet-Sarasate). 3.25, Song Recital by Luejaj (Bass). Two Arias from Ondracek (Nowowiejski); Erotiques (Karłowicz); Langueur (Wielhorski); Song (Sym). 3.25, News. 3.40, Polish Lesson. 3.55, Light Music by the Band of the Cyganerka Theatre. Soloist: Eugène Bodo (Songs); Two Foxtrots (Hoberman); Ballet Music from Casanova (Wars); The Yellow Tango (Niman); Two Songs (Hoberman); Ballet Music from L'Ecole (Hoberman); Slow Foxtrots. Ninon (Kapper-Jurman); Two Songs (Hoberman); Paraphrase (Wielhor); Quick-step (Karaskinski). 4.50, Agricultural Report. 5.0, Talk, 5.20, Answers to Musical Queries. 5.35, Talk on Economics. 6.5, Miscellaneous Announcements. 6.25, Topical Talk. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Concert by the Station Orchestra, conducted by Nawrot. Overture on Themes from Zeller's The Bird Fancier (Bogner); Dance Suite (Manfred); Pavana Douale (Mariani); Valse d'amour (Moszkovsky); Chinese Sketches (Lecmans); Italian Serenade (Holmes); Ballet Music from The Merry Wives of Windsor (Moniuszko). 8.0, Literary Talk, relayed from Cracow, 959 kc/s, 312.8 metres. 8.15, Violin Recital by Kochansky. Reverie (Moniuszko-Meleer); Burlesque (Andrzejowski); Rigaudon (Poplawsky); Three Transcriptions by Kochansky: (a) Prelude in E Minor (Chopin), (b) Waltz in D Flat (Chopin), (c) Habanera from Carmen (Bizet); Serenade (Spencer-Dyke); La chasse (Cartier); Nocturne (Hubay); Ballet Music from Rosamund (Schubert); Mazurka (Mlynarsky); Polonaise in D (Wieniawski). 9.0, Sports Notes. 9.10, Dance Music. 10.0, News, Weather and Police Notes. 10.5, Dance Music (contd.).

ZURICH.—See Schweizerischer Landessender.

# WEDNESDAY

## NOVEMBER THE FIRST

### ALGIERS

824 kc/s, 364 metres; 13 kW.—7.0 p.m., Financial Notes. 7.10, Shipping Notes. 7.15, Agricultural Notes and Weather Report. 7.20, Jacques Thibaut Recital on Gramophone Records: Two Spanish Dances (Granados); Dance from La vida breve (Fallá); Melody from Le Déluge (Saint-Saëns); Waltz in A (Brahms); Sicilienne (Vivaldi-Bach); Adagio (Paradis-Dushkin). 7.55, News. 8.0, Time Signal. 8.2, Lottery Results. 8.10, Concert by the Station Orchestra; Symphony No. 7 (Beethoven); Scene from Piccolino (Guiraud); Concerto for Cello and Orchestra (Lalo); La Jota Aragonesa (Saint-Saëns). In the interval at 8.50, News, and at 8.55, Light Music. 9.30, News. 9.35, Songs from Operetta. 9.55, News.

### ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork. 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations, and Gramophone Concert. 6.0, Programme for Children. 6.45, News. 7.0, Gaelic Talk. 7.15, German Lesson. 7.30, Time Signal. 7.31, Concert by the Transport Workers' Union of Ireland Band. 8.30, Soprano Solos by Kitty Fagan. 8.45, Pianoforte Recital by D. F. Mullen. 9.0, Baritone Solos by Myles Kelly. 9.15, Violin Recital by Mairin O'Connor. 9.30 to 10.30, Programme by the I.B.C. (Ireland). Ltd. 9.30, Concert of Dance Music. Signature Tune, Don't be late in the morning; Hustlin' and Bustlin' for Baby; Fuss, Fuss, Fuss; Stormy Weather; Moonstruck; Signature Tune, Don't be late in the morning. 9.45, Dance Music: Petting in the Park; Gipsy Fiddles; The Whisper Waltz; Under a Blanket of Blue (Synes); 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Pink Elephants (Woods); I've got to pass your House (Brown); When my little Pomeranian (Schuster); Racing Commentary; Then the Moon came out; Argentine Moon (Elkins); Rag Doll (Brown); They've taken away my Sally (Traynor). 10.30, Time, News, and Weather. 10.40, Traditional Fiddle Solos by F. O'Higgins. 11.0 (approx.). Close Down.

### BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Polonaise in B Flat (Schubert); Love Song (Burré); Selection from Hamlet (Thomas); Largo (Handel); Minuet from the Divertissement in D (Mozart); Pastorale (Wenisch); Selection from Madame Butterfly (Puccini). 7.0, Request Gramophone Music. 7.30, Exchange and Relay from the Ayuntamiento. 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices. 9.5, Concert by the Radio Orchestra: March (Canals); Jota from Los voluntarios (Jiménez); Selection from the Huguenots (Meyerbeer); Melody (Delmas); Procession and Dance (Finck); Overture, La Reine jaune (Saint-Saëns). 10.0, Organ Recital by Concepción Compté. 10.30, Dance Music, relayed from the Casa Llibre. In the interval at 11.0, News. 12 Midnight, Close Down.

### BARI

1,112 kc/s, 269.8 metres; 20 kW.—3.30 p.m., Programme for Children. 3.55 to 5.0, See Rome. 5.35, News in Albanian. 5.45 till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

### BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—8.0 p.m., Concert by the Station Orchestra. 4.0, Talk. 5.55, Time Signal and Programme Announcements. 6.0, A Short Radio Play. 6.30, Gramophone Music. 7.0 to 8.0, Programme from Ljubljana. 8.0, Programme from Vienna. 9.15, Time and News, followed by Gramophone Music.

### BERLIN

DEUTSCHLANDSENDER (Reichs sender), 143.5 kc/s, 1,635 metres; 60 kW.—11.5 a.m., Gramophone Concert: Partita in D minor for Violin (Bach); Organ Concerto in B flat (Handel); Movement from the Ninth Symphony (Beethoven); Die Allmacht (Schubert); Die Ehre Gottes in der Natur (Beethoven). After the Programme, Weather. 11.55, Time Signal. 12 Noon, Interval. 12.45, News. 1.0, Gramophone Concert (contd.): Galli-Curi; Aria from The Barber of Seville (Rossini); Milder: Hungarian Dance No. 2 for Piano-forte (Brahms); Gigli: (a) Largo (Handel). (b) Aria from Tosea (Puccini); Andersen: Bass Song from The Dusk of the Gods (Wagner); Sziget: Two Movements from the Violin Concerto in D (Brahms); Don Cossack Choir: (a) The Red Sarafan. (b) Cossack Lullaby; Egon Petri: Spinning Song from The Flying Dutchman (Wagner); The Choir of the Scala, Milan: Gipsy Chorus from Il Trovatore (Verdi); Bockelmann: Two Songs for Baritone (Loewe): (a) Heinrich der Vogler, (b) Tom der Reimer. 1.45, Programme for Children. 2.30, Weather and Exchange. 2.45, Hunting Tales: King Gunter's Hunt from the Niebelungenlied. 3.0, See Hamburg. 4.0, Talk: South-East German Culture Week. 4.25, Light Music and Dance Music by Wilfried Krüger and his Band. 5.0, Poems. 5.5, Religious Address and Organ Music. 5.30, German for

Germans. 5.50, Weather and News. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, The Day's Motto. 7.5, Radio Review of World Events. 7.55, Choral and Orchestral Concert, relayed from the Horapark, Mahlow. Soloist: Margarete Prater (Contralto). 8.15, Concert by the Station Chamber Orchestra, conducted by Steinkopf. Soloists: Heyne and Schmidt (Pianoforte); Symphony in E flat (Dittersdorf); Concerto in E flat for Two Piano-fortes (Mozart). 9.0, Weather and News. 9.30, Wireless Technical Talk. 9.45, Weather. 9.50 (approx.). See Heilsberg. 11.0 (approx.). Close Down.

### BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW.—3.30 p.m., Concert by the Walter Noack Orchestra. 4.30, Max Grube speaks of his own Life Experiences. 4.50, Chopin Pianoforte Recital by Herbert Schlicke: Nocturne, Op. 72, No. 1. Ballade in F Minor, Op. 52. 5.5, See Berlin (Deutschlandsender). 5.40, The Funkstunde informs its Listeners. 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.5, Programme of Folk Songs. 7.35, Round the Table at So-and-So's—Imaginary Conversations (Heyncke). 8.10, Symphony No. 7 in C (Schubert) by the Station Orchestra, conducted by Jochem. 9.0, Weather and News, followed by Light Music and Dance Music by the Walter Noack Orchestra, with Gramophone Interludes. In the interval at 10.0, Radio Report from Moabit. 11.0 (approx.). Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

### BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—5.15 p.m., Radio Journal. 7.35, News. 7.40, Gramophone Music. 7.55, Lottery Results. 8.0, Agricultural Talk. 8.15, News. 8.30, Gramophone Concert. 9.0, Concert.

### BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—4.55 p.m., Programme for Hungarian Listeners. Talk and Pianoforte Recital: Symphonic Poem No. 7 (Liszt); Concert Etude in D flat (Liszt); Bagatelles, Op. 13 (Dohnanyi); Allegro barbare (Bela Bartok); Night in Transylvania (Bela Bartok); Prelude and Scherzo (Zmertych); Hungarian Theme with Variations (Dohnanyi). 5.55, Programme for Women. 6.0, See Prague. 6.20, Literary Programme relayed from Kosice, 1,022 kc/s, 293 metres. 7.0, See Moravská-Ostrava. 7.40, See Prague. 8.0, See Brno. 9.0, See Prague. 9.15 (approx.). Close Down.

BREMEN.—See Hamburg.

### BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—1.10 p.m. (from Gleiwitz), Schubert and Brahms Lieder Recital by Eduard Pržibitski (Baritone). 1.40, Programme arranged by the Post Office, with Gramophone Records. 2.0, Market Prices. 2.15, Talk: Man without God. 2.35, Talk: Dutch Cheese Markets. 3.0, Concert by the Beuthen Mandoline Society. 3.50, Market Prices. 4.0, Concert of Early Works of Richard Strauss. 4.30, Hans Niekrawitz reads from his own Works. 4.50, Concert for All Souls' Day by the Choir of the Kreuzkirche. 5.50, Meat Market Prices. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.5, See Berlin (Funkstunde). 7.35, News. 7.50, Des Todes und des Lebens Reigen—Morality Play (Schulz). 9.0, See Munich. 9.20, Time, Weather and News. 9.50, All Souls' Festival by the Franciscan Choir. In the interval at 10.20, Reading: A Franciscan Legend (Holland). 11.0 (approx.). Close Down.

### BRNO

878 kc/s, 342 metres; 35 kW.—5.0 p.m., German Transmission: Programme of Songs for All Souls Day. 6.0, See Prague. 6.20, Literary Programme, relayed from Kosice, 1,022 kc/s, 293 metres. 7.0, See Moravská-Ostrava. 7.40, See Prague. 8.0, Orchestral Concert. 9.0, See Prague. 9.30 (approx.). Close Down.

### BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—10.0 a.m., Concert by the Small Station Orchestra, conducted by Leemans. Occasional Overture (Handel); Aria (Bach); Eine kleine Nachtmusik (Mozart); Ave Maria (Schubert); Violin Solo: Variations (Tartini-Kreisler); Gramophone Records: Selection from Taubhäuser (Wagner); Vieux Noël (César Franck). 11.0, Gramophone Music. 12 Noon, Gloria and Sanctus from the Missa Solemnis in D (Beethoven), on Gramo-

phone Records. 12.35 p.m., Pianoforte Recital by Mlle. Marguerite Gabetti. 1.0, Le Journal Parlé. 1.10, Concert, relayed from the Grand Hotel, Antwerp. Solemn Overture (Kéler Béla); Cello Solo: Les feuilles tombent (Février); Theme and Variations on The Trout Quintet (Schubert); Songs: (a) Autumn (Trémisot). (b) Elégie (Massenet); From Gluck to Wagner—Potpourri (Schreiner). 5.0, Concert by the Radio Orchestra, conducted by André: Three romantic Waltzes (Chabrier); Träume (Wagner); Einsamkeit (R. Strauss). 5.30, Programme for Children. 6.5, Reading of Poems. 6.15, Extracts from Judith (Honegger), on Gramophone Records. 6.30, Song Recital. 7.0, Orchestral Music: Procession Samande (Leemans); Prelude (Menlemans). 7.15, Film Review. 7.30, Medical Talk. 8.0, Organ and Violin Recital, relayed from a Church. Maurice Dejaive (Organ) and Santi Valenti (Violin). Organ Solos: (a) Prelude and Fugue in E Minor (Bach). (b) Two Chorals; Violin and Organ: (a) Andante religioso from the Concerto No. 4 (Vieuxtemps). (b) Sonata (Bach). (c) Traumeri (Schumann); Organ Solos: (a) Pièce funèbre (Plum). (b) Pièce héroïque (César Franck). 8.45, Talk. 9.0, Concert by the Station Symphony Orchestra, conducted by Jean Kumps. Scene from Parsifal (Wagner); Recitative and Aria from St. Matthew's Passion (Bach); Funeral March from the Eroica Symphony (Beethoven); Songs: (a) Le champ du silence (Saeys). (b) L'église paysanne (De Boeck); Rédemption (César Franck); Selection from Siegfried (Wagner). 9.55, Christus Vincit (Liszt). 10.0, Le Journal Parlé.

### BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish.—10.0 a.m., Gramophone Concert. 11.0, Concert by the Small Station Orchestra. Soloists: Adam (Clarinet) and Michot (Violin). 12 Noon, Orchestral Concert, conducted by Feileman, relayed from the Grand Hotel, Antwerp. Soloist: Carlo Frank (Tenor). 1.0 p.m., Le Journal Parlé. 1.10, Concert by Mickey's Club Jazz Attraction, conducted by Ludo Langlois. 5.0, Gramophone Concert: Choral in A minor (Franck); Partita in C minor (Bach). 5.30, Concert by the Station Orchestra, conducted by Kumps. Soloist: Edmond Harvant (Violin). Symphony in G Op. 88 (Haydn); Violin Concerto (Tchaikovsky); Timon d'Athènes (Lunssons); Sonata for Violin (Ysaye); Scottish March (Debussy). 7.0, Gramophone Concert: Choral Improvisati on No. 2 (Tournemire); Toccata Op. 59 (Regér); Finale from the Fantasia and Fugue on the Theme B.A.C.H. (Liszt); Morning (Grieg); The Death of Ase from the Peer Gynt Suite (Grieg); Toccata (Böhlmann); Funeral March from Saul (Handel). 7.30, Gardening Notes. 8.0, Concert of Chamber Music by the Flemish Quartet: Quartet (Haydn); Quartet Op. 80 (Dvorak). 8.45, Recitations. 9.0, Concert by the Radio Orchestra, conducted by André. Soloists: Anspach (Tenor), Bethune and Misson (Violin). Symphony No. 6 (Haydn); Tenor Solos: (a) Prologue to the Beatitudes (Franck). (b) Song (Bach). (c) L'église paysanne (Boeck); Concerto for Two Violins (Bach); Entr'acte from L'Enfance du Christ (Berlioz); Extracts from the Symphonie fantastique (Berlioz). 10.0, Le Journal Parlé.

### BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.8 p.m., Concert by the Station Orchestra: Overture, Don Pasquale (Donizetti); Waltz, Accelerationen (Jos. Strauss); Selection from Werther (Massenet); Albumblatt (Wagner); Arabesque (Debussy); Moto perpetuo (Iring); Schubert Potpourri (Urbach); Stolz Potpourri (Dostal). In an interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Gramophone Music. 6.45, Talk. 7.0, Pianoforte Recital. 7.30, Talk. 7.45, Song Recital. 8.5, Trio for Harp, Flute and Viola (Debussy). 8.30, Gramophone Music. 8.45, Radio Journal. 9.0, Popular Rumanian Music, relayed from the Enesco Restaurant.

### BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 4.30 p.m. till Close Down.—4.0 p.m., Talk: All Saints' Day. 4.30, Concert of Chamber Music by the Waldbauer Kerpely String Quartet. 5.45, Talk. 6.30, Gramophone Records and Close Down.

CASSEL.—See Frankfurt.

### COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time and Chimes from the Town Hall. 11.15, Talk for School Children. 11.45, Concert by the Bendix String Ensemble, relayed from the Wivex Restaurant. 1.0 p.m., Interval. 2.0, Gramophone Concert. 2.30, Concert by the Radio Orchestra, conducted by Grøndahl. In the interval at

3.15 (approx.), Talk for Women. 4.30, Exchange. 4.45, Review of a Book by Nils Petersen. 5.15, French Lesson. 5.45, Weather. 5.54, Announcements. 6.0, News. 6.15, Time. 6.30, Agricultural Talk. 7.0, Time. 7.1, String Quartet in E minor, Op. 83 (Elgar), played by the Breuning-Bach Quartet. 7.30, Talk on Health. 8.0 to 1.0 a.m. (Thursday), Radio Ball for the Younger Generation. 8.0, Dance Music by the Louis Preil Radio Dance Band. In the interval at 9.0, News. 10.15, Dance Music by the Valencia Band. 11.0, Time and Chimes from the Town Hall. 11.1, Dance Music by the Otto Lington Band from the Ritz Restaurant. 12 Midnight, Dance Music by the Jens Wary Band, relayed from the Nimb Restaurant. 1.0 a.m. (Thursday), Close Down.

CORK.—See Athlone.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

### FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C. Happy Hour. Part I, Request Programme of Gramophone Records: Signature Tune; Washboard Blues (Callahan); Bing Crosby; Paradise (Brown); The Mills Bros.; Sweet Sue; The Boswell Sisters; Hand me down my walking cane; Rhapsody in Blue (Gershwin); The Mills Bros.; Dirt Dishin' Daisies; The Boswell Sisters; Every-body Loves my Baby; Pianoforte Solo: Selection from The Desert Song (Romberg). Part II, Dance Music: Louiseville Lady; Then the Moon came out; Saratoga Swing; It's not a secret any more; My Moonlight Madonna; My Gal Sal; P.C. 123; Farewell to Arms; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.30, I.B.C. Nursery Corner. 5.0, Concert for Isle of Night Listeners: Organ Recital: Signature Tune, The Night by the Sea; Reminiscences of Gilbert and Sullivan; A Cuckoo in the Nest (Sievér); Pianoforte and Organ Duet: Clockwork (Mayerl); The Organ Grinder (Stock); Unrequited Love (Lincke); Organ and Xylophone Duet: The Whistler and his Dog (Pryor); Spirit of America (Zamcuk); Valse poudrée (Poppy). 5.30, Orchestral Concert for Portsmouth and Southsea Listeners: The Old Spinning Wheel (Hill); Waltz, Hand in Hand (Borganov); Song, The Spot in Exile (Gallatly); In the Night (Tate); When the convent bell is ringing (Trevor); Song, Marching through Georgia (Work); Spring Blossoms awake (Lühr); Gridiron Club March (Souza); Signature Tune. 6.0, Programme in French. 10.0 till Close Down. Programme in English by the I.B.C. 10.0 (approx.). Dance Music. Signature Tune, The Bells of Normandy; My Moonlight Madonna (Fibich); With you here and me here (Byton); Look what you've done (Kalmar); My Wishing Song (Burke); The Gold Diggers' Song (Dubin); Lover (Rodgers); I'll show you off (Hannemstein); Business in Q (Beyer); Lazybones (Mercer); Happy as the day is long (Koehler); Blue Cloud (Ewing); Isn't this a night for love (Burton); Spanish Sweetheart (Hargreaves); Egypt (Wallace); I can't remember (Berlin); I raised my hat (Franz); Signature Tune. 11.0, Talkie Time—Tunes from the Talkies. Signature Tune, Sittin' in the Dark; Under the Roof of Paris (Moretti); Love Songs of the Nile (Brown); Truly Rural Gentlemen (Heynann); Piano Solo: Dancing Butterfly (Young); She's everybody's Sweetheart now (Hargreaves); In the Park in Pares (Woods); A Nous la liberté (Auric); Pianoforte Solo: Selection from The Gold Diggers of 1933 (Dubin); Signature Tune. 11.30, Club Concert for Blackpool and Southport Listeners. Part I, Military Music. Signature Tune, The Chum Song; Washington Post March (Souza); Policeman's Holiday (Ewing); Hohomoko (Kotely); In a Chinese Temple Garden (Kotely); Lancashire Rumble; L'Entente Cordiale (Allier); Valse triste (Sibelius); Regimental March of the King's Own Royal Lancashire Regiment. 12.5 a.m. (Thursday), I.B.C. Late News Bulletin. 12.10 (approx.), Club Concert. Part II, Hot Toddy (Carter); Whispering (Schonberger); Tiger Rag (La Roca); Why do you Love (Timbridge); It's a glory (Ellington); Signature Tune. 12.30, Dance Music. Thank Heaven for you (Robin); Oh Johanna (Lawrence); Adorable (Whiting); It was a night in June (Gordon); The Windmill Waltz, (Rust); You are too beautiful (Rodgers); Sophisticated Lady (Ellington); Aloha Oe (Lilinalani). 1.0, Dance Music. Signature Tune, The Bells of Normandy; Happy as the Day is long (Koehler); Under a Blanket of Blue (Synes); I'll take an option on you (Bainger); Mademoiselle (Nesbitt); Don't Blame me (Fields); The Shadow Waltz (Warren); Twelfth Street Rag (Bowman); A Girl like Nina (Hammerstein); Carry me back to green, green Pastures (Pepper); Then the Moon came out (Miller); Ding, Doug, Ding (Hargreaves); I've found the right girl (Lupino); I lay me down to sleep (Wrubel); What a Lady Josephine must have been (Pols); Love's Lane (Miller); What a perfect combination (Kalmar); Signature Tune. 2.0, I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

## FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Act Two of Tristan and Isolde (Wagner) on Gramophone Records. 1.30, See Langenberg. 3.0, Concert by the Station Orchestra, conducted by Merten, and Soloists. Overture in C, Op. 115 (Beethoven); Soprano Aria, Misero, O sogno (Mozart); Overture in D, Op. 43 (Boccherini); Three Songs with Pianoforte Accompaniment (R. Strauss); Overture, Geneva, Op. 81 (Schumann); Four Pieces for Flute, Clarinet and Pianoforte (Kummer); Four Pieces from the Tone Poems for Violin and Pianoforte, Op. 34 (Klas); Gavotte from The Three Wishes (Ziehrer); Waltz, Die Romantiker (Lanner); Polka, Durch die Lüfte (Ziehrer); Overture, Ein tolles Mädel (Ziehrer); Waltz, Grazien-Tänze (Strauss); Rocooco Gavotte from Katze und Maus (Joh. Strauss); Waltz, Telegramme (Joh. Strauss); Reise-Galop (Joh. Strauss, Senr.). 5.0, Talk: Death. 5.20, Reading. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, Topical Talk. 7.10 to 9.0, See Stuttgart. 9.0, Time and News. 9.20, See Stuttgart. 9.30, News and Weather. 9.45, Light Music. 10.0, Eurydice—The Ghosts of Women. 11.0, See Stuttgart. 12 Midnight, Close Down.

FREDRIKSSTAD.—See Oslo.

FREIBURG.—See Stuttgart.

GENEVA.—See Radio-Suisse Romande.

GENOA.—See Turin.

GLEIWITZ.—See Breslau.

GÖTEBORG.—See Stockholm.

GRAZ.—See Vienna.

HAMAR.—See Oslo.

## HAMBURG

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg, and Hamburg, 1,319 kc/s, 227.4 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., Concert by the Philharmonic Orchestra, conducted by Secker: Overture, The Barber of Bagdad (Cornelius); Symphonic Overture, Münchhausen (Proteze); Dance of the Seven Veils, from Salome (Strauss); Petite suite (Debussy): From the Field and Groves of Bohemia (Smetana); Overture, Der Improvisator (d'Albert). 4.0, Ludwig Jürgens reads from his Novel, Kehrwieder. 4.30, Topical Programme. 5.0 (from Kiel), Variety Programme—Recitations, Songs, and Solos to the Lute. 5.40, Frankfurt Exchange and Hamburg Market Prices. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.5, See Berlin (Funkstunde). 7.35 (from Hannover), Otto Leonhardt Concert, conducted by the Composer (Pianoforte). The Orchestra of Unemployed Musicians and Soloists. Corona Schoene-Blanck (Soprano), Emil Bartels (Cello) and Willy Craney (Pianoforte). Introductory Dialogue: The Composer and his Work. First Movement from the Symphony in G Minor, Op. 10; Two Songs for Soprano, Op. 16: (a) Nacht, (b) Ruhe; Scherzo, from the Symphony in G Minor, Op. 10; Adagio from the Cello and Pianoforte Sonata, Op. 13; Two Pieces from Aus meine Tagebuch for Pianoforte, Op. 31: (a) Erwachen, (b) Auf dem Kirchhof; Four Songs for Soprano, Op. 29; Orchestral Piece, Op. 15, Was mir der Wald erzählt. 8.35, Variety Music on Gramophone Records. 9.0, Time and News. 9.20 (from Bremen), Light Music from the Café Atlantik. 10.10 (from Hannover), Dance Music by the Berndsen Orchestra, from the Georgspalast.

HANOVER.—See Hamburg.

## HEILSBURG

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert for All Saints' Day. In the intervals at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office, with Gramophone Records. 2.0, Exchange and Market Prices. 2.20, Hints for the Housewife. 3.0, Concert by the Königsberg Opera House Orchestra, conducted by Brückner: Selected Pieces (Hassa-Göhler); Prelude to The Creation (Haydn); Andante from Symphony No. 4 in C Minor, the Tragic (Schubert); Suite, the Péleas et Mélisande (Debussy); Fantasia on Themes from The Miracle (Humperdinck); March from Die Legende von der heiligen Elisabeth (Liszt). 4.30, Review of Books on the Racial Question. 4.45, Talk: How our Forefathers settled in East Prussia. 5.15, Agricultural Prices. 5.20, Talk on the Art of Pianoforte Playing, with Illustration: Etudes, Part 2, Op. 25 (Chopin). 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, News and Weather. 7.10, Nicodemus—Opera in Three Acts (Hans Grimm); The First Performance, relayed from the Danzig State Theatre. 9.30, News, Weather and Sports Notes. 9.50 (approx.), Concert by the Small Station Orchestra, conducted by Wilken: Prelude to and Selection from Der Evangelinam (Kienzl); Ave Maria (Bach-Gounod); Largo (Handel); Selection from Hansel and Gretel (Humperdinck); Overture, Le pardon de Ploermel (Meyerbeer); Caro mio ben (Giordano); Selection from Hanneles Himselfahrt (Graener). 11.0 (approx.), Close Down.

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WEDNESDAY

continued

## HILVERSUM

1,013 kc/s, 296.1 metres; 7 kW up to 5.40 p.m., and 20 kW from 5.40 p.m.—11.40 a.m. till Close Down, Programme of the Workers' Radio Society (V.A.R.A.). 11.40, Concert: Heil Europa (Blou); Barcarolle (Waldteufel); Serenata a Toscanini (Murzilli); The Student passes by (Ibanez); Slav Dance No. 8 (Dvorak); Melody (Pärshmann); Chassid (Jefferson); Gramophone Records: Nuit d'étoiles (Debussy); Slav Dance No. 4 (Dvorak); Songs my Mother taught me (Dvorak); Two Russian Dances (Bortkiewicz); Russian Sketches (Fétras); Gramophone Records: Selection from Der Bummelbaron (Kollo); Canamou (Calla-Leonardi); Hallo, petite femme (Valerio); Acclamations (Waldteufel); Gramophone Records: Zaragozana (Pop); Bolek (Leopold); Gamins de Paris (Berger); Rotterdamse vlag (Verhalien). 1.40, Interval. 1.55, Chopin Pianoforte Recital by Rodriguez Lopez: Mazurka No. 7 in B flat; Etude in E, Op. 10, No. 3; Tarantella; Gramophone Records: Nocturne in E flat, Op. 9, No. 2; Ballad in F minor, Op. 52. 2.40, Programme for Children. 5.10, Dance Music by Jack Bee and the Blue Bees. 6.10, Talk on Thomas More. 6.40, Talk. 7.0, Watten—Operetta (de Vries). 8.10, S.O.S. Announcements and News. 8.25, Orchestral Concert. Soloist: Kusnetzowa (Songs); Selection from A Night in May (Rimsky-Korsakov); The Canary (Tchaikovsky); O schönes Mädchen lass noch nie (Rachmaninov); Cosatchöche (Dargomjisky); Air from The Snow Maiden (Rimsky-Korsakov); Air from The Fair at Sorochinsk (Mussorgsky); A Slav Festival (Glazunov). 9.10, Gramophone Music. 9.25, Concert (cont'd.): Hungarian Comedy Overture (Kéler-Béla); Air from A Kiss in Spring (Kálmán); Canto di Capinera (Bettinelli); La danza (Rossini); Selection from The Gipsy Princess (Kálmán). 9.55, Talk with Gramophone Music. 10.25, Concert of Light Music. In the interval, Gramophone Records. 11.10, Gramophone Music. 11.40 (approx.), Close Down.

HORBY.—See Stockholm.

## HUIZEN

160 kc/s, 1,875 metres; 7 kW until 3.40 p.m. Transmitted from Kootwijk on 50 kW from 3.40 p.m.—10.40 a.m. till Close Down. Programme of the Christian Radio Society (N.C.R.V.). 10.40 a.m., Concert by the Van de Horst Trio and Mire, Ravenzwaay-Möllenkamp (Songs); Arioso (Handel); Songs of the Salvation Army; Andante from the Symphony No. 1 (Beethoven); Gramophone Records: Songs; Selection from Athalie (Mendelssohn); Lamentations nocturnes (Lanchy). 11.40, Police Messages. 11.55, Gramophone Music. 12.10 p.m., Concert (cont'd.): Caro mio ben (Giordano); Suite No. 3 (Handel); Hail, Hail from Joshua (Handel); Air, Tod und Moder dringt herein (Telemann); Violin, Cello and Pianoforte (Concerto (Telemann). 12.55, Organ Recital by Kloeker: Marche solennelle (Mauilly); Vertwifeling (Kuiler); Berusting (Kuiler); Eenzaam in 't woud (Kloeker); Finlandia (Sibelius); Pastoral Fantasia (Breitenbach). 1.40, Gramophone Music. 2.10, Talk for Women. 2.40, Trio in B sharp, Op. 99 (Schubert), by the Hague Trio. 3.20 to 3.40, Interval. 3.40, Religious Reading. 4.10, Trio in B, Op. 8 (Brahms), by the Hague Trio. 4.40, Programme for Children. 5.40, Agricultural Talk. 6.10, Programme to be announced. 6.40, Police Messages. 6.55, Religious Notes. 7.10, Talk. 7.40, Divine Service, relayed from a Church at Leenwarden. 9.10, Gramophone Music and News. 9.25, Organ Recital by Stretomini: Overture, Zampa (Hérold); Minuet (Boccherini); Fremersberg (Koenemann); Turf in de ransel; My Old Kentucky Home (Foster); Stars and Stripes (Songs); Improvisation (Stretomini). 10.10, Gramophone Music. 11.10 (approx.), Close Down.

INNSBRUCK.—See Vienna.

KALUNDBORG.—See Copenhagen.

KIEL.—See Hamburg.

KLAGENFURT.—See Vienna.

KOSICE.—See Prague.

## LANGENBERG

635 kc/s, 473 metres; 60 kW.—11.0 a.m., Concert by the Station Orchestra, conducted by Buschkötter: Soloists: Erdmuth Fiebigler (Contralto), and Braun (Violin); Coriolanus Overture (Beethoven); First and Second Movements from the Violin Concerto in G minor (Brahm); Cantata for Contralto Solo, Chorus and Orchestra; Wenn der jüngste Tag wird werden (Mengelbier); Entr'acte from Rosamund (Schubert); Prelude to Tristan and Isolde (Wagner). 12 Noon, Talk from Stuttgart. 12.15 p.m., Concert of Chamber Music: The Small Station Choir conducted by Breuer, Schneiderhan and Müller (Violin), Bussbach (Viola), Schriber (Cello), Appelmann (Bass), Haass (Pianoforte), and Hilgers (Organ); Trio No 5 in

G (Beethoven); Four Songs for Choir: (a) O ben Jesu (Palestrina), (b) Lasciate Miurire (Monteverdi), (c) Wenn ich einmal soll scheiden (Bach), (d) Ave verum (Mozart); Pianoforte Quartet in G minor (Mozart). 1.30, Programme for Children. 2.30, Pianoforte Recital by Hans Haass: Rhapsody in B minor (Brahms); Ballade in G minor (Chopin). 2.45, A Visit to the Essen Bird Sanctuary. 3.0, See Frankfurt. 5.0, A Radio Calendar—November. 5.30, Pianoforte and Violin Sonata in F (Mozart), played by Wielsch and Müller. 5.45, Talk: Biology and Politics. 6.0, Transmission for all German Stations relayed from Stuttgart. 7.0, See Frankfurt. 7.10 See Stuttgart. 9.30, News, Weather and Sports Notes. 9.40, Gramophone Music. 10.0, See Frankfurt. 11.0, See Stuttgart. 12 Midnight, Close Down.

LAUSANNE.—See Radio-Suisse Romande.

## LEIPZIG

769.9 kc/s, 389 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.5 a.m., Concert by the Station Orchestra, conducted by Blumer. Symphonic March, Op. 14a (Knappe); Selection from Manon Lescaut (Puccini); Polonaise, No. 2 (Liszt); Waltz, Op. 39 (Brahms); Suite, Jeux d'enfants (Bizet); Overture, Eine Nacht in Venedig (Strauss); March, Mit Eichenlaub und Schweren (Bon); Waltz, Children of Spring (Waldteufel); Selection from The Geisha (Jones). In the interval at 12.15 p.m., News and Programme Announcements. 1.0, News. 1.15, Talk on Taxation. 2.0, Quintet in E flat for Pianoforte, Oboe, Clarinet, Horn and Bassoon, Op. 16 (Beethoven), on Gramophone Records. 2.35, Market Prices. 3.0, Programme for Young People. Part I: Concert by the Station Orchestra, conducted by Hilmar Weber. Overture, Der vierjährige Posten (Schubert); Music to the Fairy Opera, Das Christellein (Pfitzner); Suite from Coppélia (Delibes); Music to the Ballet, Die Puppenfee (Bayer). Part II: Robert Mayer, the Discoverer of the Law of Energy—Educational Play. 4.40, Topical Talk. 5.0, Music from sound Films on Gramophone Records. 5.30, Talk: The Battle of Coronel November 1, 1914. 5.45, Economic Notes and News, followed by Review of the Day's Events. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.5, See Berlin (Funkstunde). 7.35, Programme to be announced. 9.0, News and Sports Notes. 9.30, Talk on Heredity. 10.0 (from Dresden), Dance Music by the Kaufmann Band. 11.0 (approx.), Close Down.

LINZ.—See Vienna.

## LUXEMBOURG

352 kc/s, 1,191 metres; 200 kW.—Luxembourg Evening. 7.0, Concerto, No. 1 in B flat, Op. 23 (Tchaikovsky). 7.35, Song Recital by Auguste Dommén. 8.0, Talk in German. 8.10, Gramophone Record: Invocation (Ganne). 8.15, Songs and Recitations. 8.30, Gramophone Record: Andante religioso (Thomé). 8.35, News in French. 8.45, See Paris (Radio Paris). In the interval at 9.45, News in German. 10.45, Gramophone Records of Dance Music.

## MADRID

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Concert of Popular Music. In the interval at 10.45, Radio Chronicle. 11.45, Light Music. 12 Midnight to 12.30 a.m. (Thursday), Programme in English by the I.B.C. Concert by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Signature Tune: Come back to Erin; Soft Lights and Sweet Music; Butterflies in the Rain; I may be wrong but I think you're wonderful; I am so anxious, dear; Selection from Congress Dances; There's a House on a Hill; Selection from Yes, Mr. Brown; Signature Tune: Come back to Erin. 12.30, I.B.C. Goodnight Melody and Close Down.

## MADRID

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Announcements, Programme for Women, and Dance Music. 8.15, Topical Review. 8.30 to 9.30, Interval. 9.30, Chimes, Time and Topical Review. 9.45 (approx.), Concert by the Madrid Philharmonic Orchestra, conducted by Pérez Casas. 11.45, Topical Review. 12 Midnight, Chimes and Close Down.

MALMO.—See Stockholm.

MILAN.—See Turin.

## MORAVSKA-OSTRAVA

1,137 kc/s, 263.8 metres; 11 kW.—3.30 p.m., Concert by the Station Orchestra, conducted by Plichta: Overture, J. K. Tyl, Op. 62 (Dvorak); Ballet Music from Faust (Gounod); Selection from Lakmé (Delibes); Lullaby (Kricka); Suite in Old Style (De Taeye); Ballad (Ondrick); Spanish Caprice (Malvezzi); Souvenir (Sebestik); Czech

Dance (Balling). 4.30, See Prague. 6.20, Literary Programme, relayed from Kosice, 1,022 kc/s, 293 metres. 7.0, Programme of Literature and Music for All Saint's Day. 7.40, See Prague. 8.0, See Brno. 9.0, See Prague. 9.15 (approx.), Close Down.

MOTALA.—See Stockholm.

MUHLACKER.—See Stuttgart.

## MUNICH

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 550 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.0 p.m., Organ and Song Recital by Gustav Schoedel and Margaret Leander (Soprano). 3.30 (from Nürnberg), Orchestral Concert. 4.15, Talk: Charms and Talismans. 5.5, Lobet Gott—Cantata (Bach) by the Station Chamber Choir, conducted by Prof. Zengerle and Gustav Schoedel (Organ). 5.25, Talk on the Racial Problem. 5.45, Weather and Sports Report. 6.0, Transmission for all German Stations, relayed from Stuttgart. 7.0, Das grosse Totenspiel—Radio Play (Ernst Wiechert), with Music by Werner Egk. 8.30, Pianoforte Trio in B flat, Op. 97 (Beethoven), by the Ely Ney Trio. 9.0, Austria. 9.20, Time and News. 10.0, Serenade, conducted by Erich Kloss. 11.0 (approx.), Close Down.

NAPLES.—See Rome.

NOTODDEN.—See Oslo.

## OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Concert by the Radio Ensemble, conducted by Johannesen, relayed from Bergen, 825.5 kc/s, 636.6 metres: Selection from The Pearl Fishers (Bizet); Liebesleid und Liebesfreud (Kreiser); Dance of the Hours, from La Gioconda (Ponchielli); Ballet Suite (Pop); Orientale cantabile (Cui); Waltz, Wienerblut (Strauss). 5.0, French Lesson. 5.30, Programme for Girls. 6.0, Announcements, Weather and News. 6.30, Talk: The Earth and the Planets. 7.0, Time Signal. 7.1, Song and Cello Recital. 7.45, Relay from the Engineers Annual Banquet. 8.0, Recitations. 8.30, Agricultural Report, Weather and News. 9.0 Topical Talk. 9.15, Concert by the Station Orchestra, conducted by Kramm: Concerto in A minor for Two Violins, Organ and String Orchestra (Vivaldi); Symphony in G minor (Mozart). 10.0, Dance Music on Gramophone Records. 11.0 (approx.), Close Down.

OSTERSUND.—See Stockholm.

## PALERMO

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Notes, Tourist Talk, Agricultural Report and Giornale Radio. 7.20, Gramophone Music. In an interval at 7.30, Time Signal and Announcements. 7.45, Orchestral Concert; Soloists: Castagna (Bassoon) and Notarbartolo (Soprano); Hungarian March (Berlioz); Suite in F for Bassoon and Pianoforte (Wolf-Ferrari); Dance from The Fair Maid of Perth (Bizet); Soprano Solo: (a) Voi siete la più bella, (b) Impossibile; Bassoon Solos: (a) Schianto (Caminitti), (b) Extract from the Bassoon Concerto (Pierini), Gigue (Martucci); Soprano Solos: (a) La perla, (b) Clavellita; Overture, Coriolanus (Beethoven). In an interval, Talk. After the Concert, Gramophone Music. 10.0, News.

## PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals).—5.45 p.m., Le Journal Parlé. 8.15 p.m., Symphony Concert conducted by Flament: Pieces for Flute (Debussy); Sonata in E minor for Two Violins (d'Andrien); Fantasia for Bassoon, Violin and Cello (Flament); The Scottish Symphony (Mendelssohn); Rhapsody No. 1 in F (Liszt-Schmid). 9.0 (approx.), Close Down.

## PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Gramophone Music: Recitative and Cavatina from Prince Igor (Borodin); Selection from A Night in May (Rimsky-Korsakov); Cradle Song (Gretchaninov); Cradle Song (Liadov). 7.15, Le Journal Parlé. 7.30, New Gramophone Music. 8.0, Talk on Economics. 8.10, Interval. 8.25, La Citta Morta—Tragedy (d'Annunzio). 10.30, News.

## PARIS

RADIO-PARIS, Call GFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture (cont'd.). 7.45, Gramophone Music. 8.0, News. 12 Noon, Educational Talk. 12.15 p.m., Overture, William Tell (Rossini), on Gramophone Records. 12.30, Organ Recital from the Gaumont Palace: Selection from Tristan and Isolde (Wagner); Marche funèbre d'une Marionnette (Gounod); Fan-

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tasia and Fugue in G Minor (Bach). 1.0, Exchange and News. 1.5, Gramophone Concert for All Saints' Day; Requiem (Fauré); Tenebrae factae sunt (Palestrina); Prelude, Fugue and Variations (Frankel); Symphony in C with Organ (Saint-Saëns). In the interval at 1.30, Exchange. 2.0, Exchange. 2.30 (approx.), Running Commentary by the Parleur inconnu on the International Football Match, Paris v. Vienna, relayed from the Parc des Princes. 3.45, Exchange and Market Prices. 6.20, Agricultural Talk. 6.45, Gramophone Music: Sarabande et Tambourin (Leclair-Sarasate); Tambourin (Rameau); Romance in A (Schumann); Passepied in A (Destonches-Casadesus). 7.0, Medical Talk. 7.20, Concert of Light Music: The Cadets (Souza); First Waltz (Draud); Selection from The Desert Song (Romberg); Hawaii; My Blue Heaven (Donaldson); Douce tendresse (Paradis); Song (Friml); Ça c'est Paris (Padilla). 7.45, Commercial Prices and News. 8.0, Reading of Poetry by Gabriel Rigond. 8.30, News. 8.40, Fashion Review. 8.45, Concert by the Lamoureux Concert Society, conducted by Albert Wolff: Symphony in G (Roussel); Nocturnes (Debussy); Spanish Symphony (Lalo); Pastorale Suite (Chabrier); L'apprenti sorcier (Dukas). In the intervals at 9.15, Press Review and News.

**PITTSBURGH**

KDKA, 980 kc/s, 306 metres; 50 kW. Relay by W8XK on 48.86 metres and 25.27 metres.—7.0 p.m., Musical Originalities, from New York. 7.30, KDKA Home Forum. 8.0 to 9.30, New York Relay. 8.0, U.S. Navy Band. 8.15, Utility Hall. 8.30, Dixie Days. 9.0, Betty and Bob. 9.15, Southern Symphonies. 9.30, Frances Ingram. 9.45, News and Markets. 10.0, Uncle Tom and Betty. 10.15, KDKA Kiddies' Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News, Piano Classic. 11.15, Sports, Pat Haley. 11.30, Pittsburgh Spotlights. 11.45 to 12.30 a.m. (Thursday), New York Relay. 11.45, Lowell Thomas. 12 Midnight, Amos 'n' Andy. 12.15, Gems of Melody. 12.30, What would you do? 12.45 to 3.30, New York Relay. 12.45, Irene Rich for Welch. 1.0, Crime Chics. 1.30, Potash and Perlmutter. 1.45, Red Davies. 2.0, Warden Lawes. 2.30, John McCormack and Orchestra. 3.0, Pedro Via's Orchestra.

PORSGRUND.—See Oslo.

**PRAGUE**

614 kc s, 488.6 metres; 120 kW. 3.30 p.m., See Moravská-Ostrava. 4.30, Talk. 4.45, Gramophone Music. 5.0, German Transmission: Aekermann from Bohemia—Play, and News. 6.0, Time and News. 6.5, Talk on Indian Ancestor Worship. 6.20, Literary Programme for Kosice, 1,022 kc s, 293 metres. 7.0, See Moravská-Ostrava. 7.40, Talk: Prague Cemeteries. 8.0, See Brno. 9.0, Time and News. 9.15, News in French. 9.30 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

SOTTENS, 743 kc s, 403 metres; 25 kW; and Geneva, 395 kc s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Geneva), Gramophone Music. Hands across the Ocean (Souza); Was die Donau erzählt (Morena); Two Italian Songs: Offenbach Potpourri. 12 Noon (from Geneva), Financial News. 12.10 p.m., (from Geneva), Gramophone Music. Sonatina (Ravel); Airs from Idomeno and Il Seraglio (Mozart); Plaisir d'amour (Lully); Au clair de la lune (Lully); Le Martyre de Saint Sébastien (Debussy); Scherzo from Queen Mab (Berlioz); Popular German Songs. 1.0 to 2.58, Interval. 2.58, Time Signal from Neuchâtel Observatory. 3.0, See Schweizerischer Landessender. 5.0 (from Lausanne), Programme for Children. 6.0 (from Geneva), Talk on Chemistry. 6.20, Science Talk. 7.0 (from Geneva), Piano-forte Solos. Romance (Mozart); Rondo (Haydn); Impromptu (Chopin); L'île joyeuse (Debussy). 7.20, Concert by the Radio Orchestra, conducted by Robert Echenard. Five Water-Colours (Strang); Three Pieces (d'Ambrosio): (a) Feuilles éparées, (b) Conzozetta from the Violin Concerto, No. 3, (c) En badinant; Three Pieces (Gürand): (a) Persian Dance, (b) Divertissement and Petite marche, (c) Overture, Piccolino. 8.20, Talk: All Saints' Day. 8.30, Gregorian Choir Recital with Commentary. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

RJUKAN.—See Oslo.

**ROME**

Call IRO, 680 kc/s, 441 metres; 50 kW. Relay by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc s, 453.2 metres from 7.45 p.m. and 2RO, 11,810 kc s, 25.4 metres from 4.15 p.m.—12 Noon to 1.15 p.m., Orchestral Concert of Light Music. In the intervals from 12.30 to 12.45, Giornale Radio and Exchange, and at 1.0, Time and Announcements. 3.30, Children's Radio Review. 3.55, Giornale Radio, Exchange and Report of the Royal Geographical Society. 4.10, Weather. 4.15 to 5.0, Orchestral Concert of Light Music. 5.40 (Naples), Shipping and Sports Notes. 5.45, Dopolavoro and Tourist Re-

port. 5.57, Report of the International Institute of Agriculture (in Italian and English). 6.10, Agricultural Notes. 6.20, News in Foreign Languages. 6.40, Giornale Radio. 7.0, Time, Announcements and Gramophone Music. 7.15, See Turin. 7.30, Giornale Radio and Sports Notes. 7.45, Violin Recital by Arrigo Serato. 8.45 (approx.), Il Dilettate—Apologue in One Act in Verse (Giosue Borsi). 9.15, Dance Music. 10.0, Giornale Radio.

SALZBURG.—See Vienna.

**SCHENECTADY**

WGY, 790 kc/s, 379.5 metres; 50 kW. Relay at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—7.30 p.m., Two Seats in the Balcony, from New York. 8.0, Grande Trio, from New York. 12.45 a.m. (Thursday), Stock Reports. 1.0, George Olsen and his Orchestra, from New York. 1.30, Variety Programme. 2.0 to 4.0, New York Relay. 2.0, Ipana Troubadours. 2.30, Leo Reisman's Orchestra. 3.0, Popular Programme. 3.30, National Radio Forum. 4.0, Programme Résumé.

**SCHWEIZERISCHER LANDESENDER**

BEROMUNSTER, 653 kc s, 459 metres; 60 kW.; Basle, 1,229 kc s, 244.1 metres; and Berne, 1,220 kc s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne), Gymnastics. 11.0 (from Berne), Chamber Music on Gramophone Records. 11.29, Time Signal from Neuchâtel Observatory. Weather and News. 11.40 (from Berne), Music which fell flat—Recital of Little-known Masterpieces, with Com-

12 Noon, Gramophone Concert. 12.45 p.m., News. 1.0, Time. 1.1, Gramophone Records. 2.0, Interval. 4.0, Ravel Concert on Gramophone Records. 5.0, All Souls' Day—Protestant Service, relayed from the Church of St. Thomas. 6.0, Talk: The Function of Fairs and Exhibitions. 6.15, Concert of Chamber Music by Soloists of the Station Orchestra: String Quartet; Death and the Maiden (Schubert); Quintet for Strings and Piano (Brahms). 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results and Announcements. 8.30, Catholic Service for All Souls' Day, relayed from the Strasbourg Cathedral. 9.15, Press Review. 9.20, Concert by the Station Orchestra, conducted by Maurice de Villers. Soloist: Annette Brincour (Songs), Symphony (Frankel); Prelude to Parsifal (Wagner); Songs: November (Trenisot), (b) La Toussaint (Lacôme); Funeral March from The Dusk of the Gods (Wagner); Les Cloches from La Toussaint (Delmas); Death and Transfiguration (Richard Strauss). 11.0 (approx.), Close Down.

**STUTT GART**

MUHLACKER, 832 kc s, 360.5 metres; 60 kW. Relay by Freiburg, 527 kc s, 570 metres.—12.15 p.m., Gramophone Concert. Overture, Beatrice and Benedict (Berlioz); Selection from Faust (Gounod); Ballet Music, Les petits riens (Mozart); Two Arias (Mozart): (a) Aria from The Magic Flute, (b) Aria from Figaro; Potpourri of Puccini's Music; Two Arias from Tirandot (Puccini); Tosca—Fantasia (Puccini-Tavan); Song and Duet from The Gipsy Baron (Joh. Strauss). 1.30, See Langenberg. 2.30, All Saints' Day in Swabia—Vocal and Instrumental Concert with Recitations. 3.0, See Frankfurt. 5.0



[Photo: Süddeutscher Rundfunk]

STUTT GART'S Philharmonic Orchestra, which also fills the rôle of permanent studio orchestra at the broadcasting station. The orchestra will be heard to-night at 6 o'clock.

mentary. 12.25 p.m. (from Berne), Time, Weather, and Exchange. 12.30 (approx.), to 2.30, Interval. 2.30 (from Berne), Talk for Women. 3.0 (from Berne), Concert by the Radio Orchestra. 3.50, Organ Recital by Otto Schärer. 4.30, Chamber Music. 5.0 (from Berne), Programme for Children. 5.30 (from Zürich), Talk: Christian Burial. 6.0 (from Zürich), Time, Weather, and Market Prices. 6.20 (from Zürich), English Lesson. 6.50 (from Zürich), Organ Recital. 8.0, Weather and News. 8.10 (from Zürich), All Saints' Day Concert. 9.15 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc s, 436 metres; 55 kW. Relay by Boden, 244 kc s, 1,229.5 metres; Göteborg, 932 kc s, 322 metres; Hörby, 1,166 kc s, 257 metres; Motala, 222.5 kc s, 1,348 metres; Östersund, 389 kc s, 770 metres, and Sundsvall, 554 kc s, 542 metres.—12 Noon to 12.30 p.m., Broadcast for Schools. 4.5, Organ Recital of Light Music by Gösta Berlin. 4.30, Reading (G. K. Chesterton). 5.0, Gramophone Music. 6.0, Radio Report with Gramophone Records. 6.15, Weather and News. 6.30, Talk. 7.0 (from Göteborg), Concert by the Symphony Orchestra, conducted by Tor Mann. Soloist: Gunnar de Frumerie (Piano-forte); Suite in G minor (Bach); Variations for Piano-forte and Orchestra (Gunnar de Frumerie); Symphony No. 4 in E minor, Op. 98 (Brahms). 8.30, Dialogue. 8.45, Weather and News. 9.0, Dance Music relayed from Berne Hall. 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—9.30 a.m., Chimes and Pontifical High Mass relayed from the Strasbourg Cathedral. 10.30, Gramophone Concert. 11.30, Catholic Service,

(from Freiburg), Religious Address: All Souls' Day. 5.40, Talk on Theodor Mommsen on the Thirtieth Anniversary of his Death. 6.0, Transmission for all German Stations. The Mannheim School—the Cradle of German Classics—Concert by the Station Orchestra, conducted by Ferdinand Drost. Soloists: Margarete Teschemacher (Soprano), and Hermann Hubl and Eduard Oswald (Violin); Concerto for two Violins and Orchestra (Stamitz); Aria from 'Cyo riconosciuto (Hass-Holzhaber); Symphony for Two Orchestras (Stamitz). 7.0, See Frankfurt. 7.10, Der Herrgottsschnitzer von Annerngau—Play (Ganghofer-Neuert). 8.20, Concert by the Station Orchestra, conducted by Gerd Schneider. Soloists: Artur Haagen (Piano-forte), Hermann Hubl (Violin), and Hans Reichardt (Cello). Part I: Nocturne in E Flat, Op. 148 for Piano-forte, Violin and Cello (Schubert). Part II: Die Jungfrau und die Nonne—a Legend by Gottfried Keller—Music by Gerd Schneider. 9.0, See Munich. 9.20, Topical Talk. 9.30, See Frankfurt. 9.50, Local News. 10.0, See Frankfurt. 11.0, Serenade. 12 Midnight, Close Down.

SUNDSVALL.—See Stockholm.

**TOULOUSE**

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW. 5.15 p.m., Music from Opera: Airs from Rigoletto (Verdi), Samson and Delilah (Saint-Saëns), Tosca (Puccini), I Pagliacci (Leoncavallo), La Traviata (Verdi), La Chémise (Leroux), Carmen (Bizet), and Le Pré aux Cleres (Hérold). 6.50, Talk. 7.15, News and Racing Results. 7.30, Ballet Music from Les Deux Pigeons (Messager). 7.45, Sound-Film Music. 8.0, Music by a Viennese Orchestra. 8.30, Chansonnettes. 8.45, Orchestral Music: Poupée valsante (Pollini); Rondo capriccioso (Mendelssohn); Russian Potpourri (Benedict); Piece (Strauss). 9.0, Ex-

tracts from Don Giovanni—Opera (Mozart). 9.30, Orchestral Music: Dance of the Hours from La Gioconda (Ponchielli); Selection from The Good-humoured Ladies (Tommasini); Suite orientale (Popy); Waltz (Chopin); Rondo (Hadermann). 10.0, Operetta Music: Airs from The Merry Widow (Lehar), The Desert Song (Romberg), Encore cinquante centimes (Yvain), and La Basoche (Messager). 10.15, North-African News. 10.30, Concert for Listeners in Morocco. 11.0, Argentine Music. 11.15, Dance Music. 11.30, Orchestral Music: Marche des petits faunes (Pierné); Bolero (Ravel); March (Ravel); Les joyeux Forgerons (Messier). 11.45, Spanish Songs. 12.0 Midnight, News. Weather and Announcements. 12.5 a.m. (Thursday), Bal-Musette. 12.15, Orchestral Music. 12.30 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m., till Close Down, See Turin.

TRONDHEIM.—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relay by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Soprano and Tenor Song Recital. 5.0 to 5.5, Weather. 5.40, Giornale Radio, Dopolavoro Notes and Gramophone Music. 6.0, Time, Tourist Talk and Gramophone Music. 6.10, Agricultural Report. 6.20, News in Foreign Languages. 6.40, Gramophone Music. 7.0, Time, Announcements, Giornale Radio and Weather. 7.15, Medical Talk. 7.30, Comedy in Three Acts, followed by Variety Music. 10.0, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15 a.m., Religious Information in Spanish. 7.0 to 7.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc s, 517 metres; 100 kW. Relay by Graz, 852 kc s, 352.1 metres; Innsbruck, 1,058 kc s, 283 metres; Klagenfurt, 662 kc s, 453.2 metres; Linz, 1,220 kc s, 245.9 metres; and Salzburg, 1,373 kc s, 218.5 metres.—11.0 a.m., concert by the Wiener Symphoniker, conducted by Hugo Reichenberger. Soloist: Alfred Jerger (Baritone). 1.0 Interval. 2.0, Time and News. 2.10, Talk: The Chicago World Fair. 2.35, Concert of Chamber Music by the Graf-Kurz Quartet. String Quartet in A, Op. 41, No. 3 (Schumann); String Quartet in D, Op. 18, No. 3 (Beethoven). 3.35, Talk: In memory of the Dead Prisoners of War. 4.5, Extracts from Parsifal—Opera (Wagner), on Gramophone Records. 5.15, Talk: The Gambler's Philosophy. 5.30, Reading (Sauter). 6.0, Concert by the Wiener Symphoniker, conducted by Josef Holzner. Overture, The Hermit's Bell (Maillart); Song Der letzte Gruss (Komzak); Abschiedswalzer (Joh. Strauss); Song, Trockne die Tränen (von Uj); Ouvertüren-Extrakt (Englemann); Sanctuary of the Heart (Ketybey); Nordic Suite (Frederiksen); Waltz, Alt Wien (Heuberger); Die goldene Spieluhr (Krome); Hymn to St. Cecilia (Gounod); Valse triste (Nedbal). In the interval at 6.45, Time and News. 7.0, Report on the Football Match Vienna v. Paris in Paris. 7.5, Talk: Christianity and the Social Order, according to the Encyclical of Pope Pius XI. 7.35, Programme for all Souls' Day. Address, Relay from the Kriegerfriedhof, Amras. 8.0, Requiem (Mozart), by the Hofmusikkapelle, conducted by Carl Lutz. Soloists: Kurt Kettner (Soprano), Robert Huber (Viola), Richard Tomek (Tenor), and Rudolf Zeindler (Bass). 9.0, News. 9.5, Esperanto Report: The National Library and the Adjoining International Esperanto Museum in Vienna. 9.20, Announcements.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Chimes from St. Mary's Church, Cracow. 11.5, Programme Announcements. 11.10, Weather. 11.15, Concert by the Station Symphony Orchestra, conducted by Oziminsky. Soloist: Marie Dabrowska (Piano-forte). Talk in the interval. 1.0 p.m., Talk: The Protection of Orchards in the Winter. 1.15, Gramophone Music. 2.0, Agricultural Talk. 2.20, Piano-forte Recital of his own Compositions by Nawrocki: Chanson du soir; Chanson d'adieu; Prière; Nocturne, Vision; Six Sonatas with Elegy. 3.0, Programme for Children. 3.30, Famous Artists on Gramophone Records—Huberman. 3.45, Reading, relayed from Cracow, 959 kc/s, 312.8 metres. 4.0, Talk relayed from Lwów, 788 kc/s, 381 metres. 4.15, Choral Concert of Polish Songs. Soloist: Edvige Hentert (Soprano). 5.0, Dramatic Programme. 5.40, The Choir of the Sistine Chapel on Gramophone Records. 6.0, News. 6.5, Miscellaneous Announcements. 6.30, Programme Announcements. 6.35, Musical Programme. 7.50, Radio Journal. 8.0, Topical Talk. 8.15, Cello Recital by Enrico Mainardi: Adagio and Allegro (Bocherini); Sonata (Gaillard); Suite (Bach); Short Pieces by Debussy, Granados, Fauré and Popper. 9.15, Sports Notes. 9.25, Gramophone Music. 10.0, News. 10.5, Gramophone Music.

ZURICH.—See Schweizerischer Landessender.

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations and Gramophone Concert. 6.0, Programme for Children. 6.40, News. 7.0, French Lesson. 7.15, Talk. 7.30, Time Signal. 7.31, The Station Orchestra. 7.50, Pianoforte Recital by W. Beardwood. 8.0, Mezzo-Soprano Solos by Mollie Anderson. 8.10, Pianoforte and Violin Recital by R. Rodgers and F. Byrne. 8.30, Adam's Apple—A Sketch, by the Leven Players. 9.0, Orchestral Concert. 9.30 to 10.30, Programme by the I.B.C. (Ireland), Ltd. 9.30, Orchestral Concert: Overture Medley (arr. Peters); Song, Wayside Rose from Frederica (Lehár); Petting in the Park (Warren); Pizzicato from Sylvia (Delibes); Selection from Lilac Time (Schubert-Berté); Song, Softly, as in a Morning Sunrise, from The Cat and the Fiddle (Kern); Carolina Lullaby; Hungarian Dance No. 1 (Brahms); Wireless World Announcement. 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Dance Music: Twenty Million People: How do you do, Mr. Brown; Carolina Lullaby; Racing Commentary: The Debutante; Trouble in Paradise; Black Rhythm; Can't we meet again. 10.30, Time, News and Weather. 10.40, Traditional Fiddle Solos by S. O'Mahon. 10.50, Accordion Solos by Michael Grogan. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert. In the interval, Talk. 7.0, Request Gramophone Music. 7.30, Exchange and Request Gramophone Music (cont'd.). 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange, and Market Prices. 9.5, Concert by the Radio Orchestra: Two Step (Millan); Selection from Sangre de Reyes (Luna and Balaguer); A los toros (Turina); Abada a una germana (Caludi); Aria (Respighi); Overture, Coriolanus (Beethoven). 10.0, Comedia d'Amor—Play in Two Acts (Pompeu Crehuet). In the interval at 11.0, News. 12 Midnight, Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—See Rome. BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—5.55 p.m., Time Signal and Programme Announcements. 6.0, Yugoslav Music on Gramophone Records. 6.20, Talk. 7.0, Concert by the Belgrade Quartet: Quartet (Mozart); Quartet (Lully). 7.55, Recital of Opera Arias. 8.40, Harp Recital. 9.0, Time and News, followed by Concert by the Station Orchestra.

## BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—11.0 a.m., Gramophone Concert: Ein Prosit unsern Frauen (Raymond); Waltz, Kunstlerleben (Strauss); Koboldstreichle (Zielke); Folk Song, Sonntag ist es heut; Dream Waltz (Frais); St. Florian hill (Meyer-Helmund); Daisy Waltz (Dacre); Alt-Heideberg (Jensen); Waltz, Nachtschwärmer (Zielner); Melody (Bochmann); La Paloma (Yradier); None but the worthy heart (Tchaikovsky); Kam der Tag (Schubert); Spatenparade (Rathke); Winterlied (Koss); Kiss-Walzer (Strauss). After the Programme, Weather. 11.55, Time Signal. 12.45, News. 1.0, Gramophone Concert (cont'd.): Overture, Die Balho (Sullivan); Slav Rhapsody (Friedemann); Festival Overture (Lassen); Extracts from The Geisha (Jones); Overture, The Bartered Bride (Smetana); Song from Der Bettelstudent (Millöcker); Oriental Suite (Popy); Moonlight on the Colorado (King). 1.45, Programme for Young People. 2.30, Weather and Exchange. 2.45, Hunting Tales: Reading (Gager). 3.0, See Stuttgart. 4.0, Programme for Women. 4.25, Contemporary Chamber Music: Sonata for Violin and Pianoforte (Ebel); Modern Songs. 5.0, Poems. 5.5, It's no Laughing Matter—Variety Programme. 5.30, Agricultural Programme. 5.50, Weather and News. 6.0, Transmission for all German Stations relayed from Munich. 7.0, Today's Motto. 7.5, Heredity—A Play about Eugenics (Dürre). 8.0, Part Relay of a Concert from Breslau. 9.0, Weather, News and Sports Notes. 9.45, Weather. 10.0, Programme to be announced.

## BERLIN

WITZLEBEN, 716 kc/s, 419 metres; 1.5 kW.—12 Noon, Gramophone Concert. Part I: Old Music: Pavana (Hansman); Dance (Hansman); Sellinger's Round (Byrd); Old English Dances of Shakespeare's Time; La Tuidie and Tambourin (Rameau); The Toe Choc (Couperin); Suite in A (Vivaldi); Siciliano (Gemiani); Suite from The Good-Humoured Ladies (Scarlatti). Part II: Music by Glück. Overture, Baritone Aria and Chorus from Iphigenia in Aulis; Musette from Armide; Soprano Song; O del mio dolce Ardor; Extract from Orpheus and Eurydice; Contralto Solo from Orpheus and Eurydice. Ballet Music from Orpheus and Eurydice. Part III: Mazepa—Symphonic Poem (Liszt). In the interval at 12.40 p.m. (approx.),

Weather and News. 2.0, Exchange. 2.20, Baltham sucht sein Glück—A Play for Young People (Martin Raschke). 2.50, Extracts from Fidelio (Beethoven), on Gramophone Records. Quartet. The Prisoners' Chorus; Florestan's Recitative and Aria; Quartet Final Chorus. 3.15, Talk on Photography. 3.30, Concert from Heilsberg. 4.30, Reading. 4.50, Symphony in G, Op. 13 (Haydn), played by the Vienna Philharmonic Orchestra (on Gramophone Records). 5.10, Talk by Peter Dörfler: The Survival of Folk Customs. 5.30, The Funkstunde informs its Listeners. . . . 5.35, Report from Magdeburg. 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Munich. 7.5, Concerto Grosso in A (Handel), played by a Chamber Orchestra, conducted by Hans von Benda. 7.30, Extracts from The Messiah (Simon), by the Station Choir, Anna Bellé (Soprano), and Alexandrine Schneckel (Contralto). Dennoch werden wir eins; Mirjans und deine Wehmut; Lob, Anbetung und Preis. 8.0, Programme for All Souls' Day (arr. Schultz). 8.30, Radio Report from the State Theatre—A Rehearsal of Schiller's Drama, Die Braut von Messina. 9.0, Weather and News. 9.15 (approx.), Concert by the Arthur Andrae Orchestra. Overture, Peter Schmolli (Weber); Selection from Das Hofkonzert (Scheinpflug); Extracts from Peterlehens Mondfahrt (Schmalstiel); Selection from Die Märkische Suiter (Kamm); Praeludium (Jarnfeldt); Serenade (Svendens); Intermezzo (Witte); Selection from Hansel and Gretel (Humperdinck). In the interval at 10.0, Topical Talk. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender. BEROMÜNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—6.15 p.m., Radio Journal. 7.35, News. 7.40, Talk, arranged by the International Labour Bureau. 7.55, Lottery Results. 8.0, Talk on Wine. 8.15, News. 8.30, Le mort chez les vivants (The Dead Man among the Living)—Comedy in Three Acts (Paul Vovard).

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Schimpel. Overture, St. Paul (Mendelssohn); Un poco triste (Suk); Wedding Scenes (Smetana); Piece (Bach-Gounod); Nocturne (Tchaikovsky); Waltz (Provažnik); Serenade in E Flat (Moor); In the Hall of the Mountain King, from the Peer Gynt Suite (Grieg). 3.50, See Brno. 4.15, See Prague. 5.0, Accordion Recital of Slovak National Songs. 5.30, Talk. 5.45, Programme for Women. 5.50, See Prague. 6.15, Talk on the following Transmission. 6.30, L'Éclair—Comic Opera in Three Acts (Hádavy), relayed from the National Theatre. 9.0, Gramophone Music. 9.5, See Prague. 10.10, (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiowitz, 1,184 kc/s, 253 metres.—11.0 a.m., Concert by the Station Orchestra, conducted by Topitz: Overture in Italian Style (Schubert); Romantic Suite (Bullerian); Selection from Faust (Gounod); Waltz, Transaktionen (Joh. Strauss); Dance Suite (Maurel); Concert Idyll, Tirili (Gaugberger); Galop (Zielner). 12.45 p.m., Time, Weather, News and Exchange. 1.10, Pianoforte Sonata in E Flat, Op. 122 (Schubert), played by Hanna Horn. 1.40, Programme arranged by the Post Office, with Gramophone Records. 2.0, Market Prices. 2.15, Book Review: Recent Papal History. 2.35, Talk on Excursions: Two Silesian Baroque Towns, Grüssau and Schönberg. 2.45, Programme for Children. 3.10, Concert by the Station Orchestra, conducted by Riechka. Soloist, Olly Stephan (Soprano); Overture in G Minor (Bruckner); Selection from Haumeles Himelfahrt (Graener); Meditation from Thais (Massenet); Extracts from Rieuzi (Wagner); Pathetic Suite (Scheinpflug); Melody (Wolf-Ferrari); Selection from Der Evangelimann (Kienzl). 5.0, Market Prices. 5.5, Talk: Silesian Peasant Art. 5.15, Programme to be announced. 5.35, Talks by Workers and their Leaders. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, News. 7.10, Concert by the Silesian Philharmonic Orchestra, conducted by Dohrn: Overture, Der Freischütz (Weber); Variations on a Theme of Haydn (Brahms); Symphony No. 5 in E Minor, Op. 67 (Beethoven); Symphonic Poem, Death and Transfiguration, Op. 24 (Richard Strauss). 9.0, Time, Weather and News. 9.30, Talk by an Englishman on British Fascism. 9.50, Concert of Sacred Music by the Station Orchestra and the

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Station Choir, conducted by Prade: Deutsche Sprüche von Leben und Tod (Lechner); Four Folk Songs: (a) Der Grimmig Tod mit seinem Pfeil, (b) Ich willt, dass ich daheim war, (c) Nun ruhen alle Wälder, (d) Gaudemus igitur. 10.30, Serenade on Gramophone Records. 12.5 a.m. (Friday), also relayed on Zeoson (31.38 metres), All Souls' Day in German Towns—Choral Music by Fräulein Choirs. 12.20 (approx.), Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—3.50 p.m., Autumn in the Woods—a Musical Play (Blatny). 4.15, See Prague. 5.25, German Transmission: News and Song Recital. 5.50, See Prague. 6.0, Talk on the 150th Anniversary of the Death of Jean le Rond d'Alembert. 6.15, See Prague. 10.10 (approx.), Close Down.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Gramophone Concert: Merry-maker's Dance (German); Chanson triste (Tchaikovsky-Steward); Love your spell is everywhere (Janis); Mouvement perpetuel (Ries); Vidalita (Pallenaerts); Aubade (Lyschakoff); Barn Dance (Lutz); Polka (Grossmith); La voix des cloches (Luigini); Pagan Love Song (Fred and Brown); Cramignon légioso (Mouron); Heartless (Meisel); What more can I ask? (Noble); Selection from He wanted Adventure (Waller); Hylde (Reynaud); Kern Potpourri. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Small Station Orchestra, conducted by Lecmans: Florentine March (Fueik); Overture, Le Caïd (Thomas); La mia serenata (Staffelli); Ballet russe (Luigini); Pianoforte Solos; Chanson d'Arlette (de Taeye); Selection from Eine einzelne Nacht (Stolz); One-step, Belle of Barcelona. 5.0, Concert by the Radio Orchestra, conducted by Walpot: March (Weyts and François); Overture, Der Bettelstudent (Millöcker); Waltz, Vision de Salomé (Joyce); Selection from Le grand Mogol (Andran); Ballet Music from La petite Bohème (Hirschmann). 5.30, Concert by a Children's Choir. 6.0, Theatre Talk. 6.15, Concert by the Small Station Orchestra, conducted by Lecmans: Overture, Armide (Glück); Andante (Mozart); Violin Solo: Prelude (Pugnani-Kreisler); Selection from Lohengrin (Wagner); Le Jardin féérique (Ravel); Violin Solo: Elegy (Delcroix); Sarabande (Debussy); Selection from The Prophet (Meyerbeer). 7.15, Talk for Workers. 7.30, Sports Talk. 8.0, Overture, Maximilien Robespierre (Litov), by the Station Symphony Orchestra, conducted by Arthur Meulmans. 8.15, Cabaret Programme. 8.45, Talk: Homage to the Dead. 9.0, Concert by the Radio Orchestra, conducted by Walpot: March, Le trompette amoureux (Walpot); Overture, The Italian Girl in Algiers (Rossini); Waltz, Roses from the South (Johann Strauss); Selection from La Favorita (Donizetti); Gramophone Records: Arias from Figaro (Mozart); Verdi Potpourri (arr. Weninger); Japanese Dance (Yoshitomo). 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

I.N.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish.—12 Noon, Concert by the Small Station Orchestra, conducted by Lecmans. 12.40 p.m., Organ Recital, relayed from the Carmelite Church. 1.0, Le Journal Parlé. 1.10, Organ Recital (cont'd.). 1.30, Extracts from The Messiah—Oratorio (Handel), on Gramophone Records. 5.0, Concert by the Station Symphony Orchestra, conducted by Meulmans. Overture, Euryanthe (Weber); The Scottish Symphony (Mendelssohn); Funeral March (Vreuls). 5.45, Programme for Children by a Children's Choir. 6.30, Liturgical Programme: arranged by the Dominican College, Louvain, with Introductory Talk. 7.12, News. 7.15, Book and Film Review. 7.30, Programme for Women. 8.0, Concert by the Radio Orchestra. 8.45, Religious Address. 9.0, Concert by the Station Symphony Orchestra, conducted by Meulmans. Soloist: Decker (Bass). Overture, Rienzi (Wagner); Rhapsody, Piet Hein (Van Anrooy); Songs for Bass, Extracts from Tsar Saltan (Rimsky-Korsakov). 9.55, Evening Prayer. 10.0, Le Journal Parlé.

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Variety Concert by the Dinico Orchestra. In an interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Talk. 6.35, Rigoletto—Opera in Three Acts (Verdi), on Gramophone Records. In the intervals, Reading and Radio Journal.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW. Also relayed on 840 metres from 6.0 p.m. till Close Down.—4.0 p.m., Talk for Farmers. 4.30, Gramophone Concert. 5.0, Review of Foreign Politics. 5.30, English Lesson. 6.10, Sacred Concert by the Budapest Choral and Musical

Society, relayed from the Academy of Music; Conductor, Emil Lichtenberg; Soloists, Anna Bathy and Alexander Parkas; Kinder-totenlieder (Mahler); Requiem (Brahms).

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time and Chimes from the Town Hall. 11.2, Concert by the Harald Andersen String Ensemble, relayed from the Hotel d'Angleterre. 1.0 p.m., Interval. 1.40, Pianoforte Recital by Eva Udsen: Concert Etude in F (Neupert); Ballet (Glück-Friedman); Phileas (Philipp); Paraphrase on Rigoletto (Liszt). 2.0, Concert by the Teddy Pearson Ensemble, relayed from the Wivex Restaurant. 3.45, Programme for Boys. 4.30, Exchange and Fish Market Prices. 4.45, Talk. 5.15, English Lesson. 5.45, Weather. 6.0, News. 6.15, Time. 6.20, Talk, Democracy or Dictatorship? 6.50, Introductory Talk to the Following Transmission. 7.0, The Damnation of Faust—Opera (Berlioz), relayed from the Odd-Fellow's Hall. The Radio Symphony Orchestra, conducted by Egisto Tango, the Station Chorus and Soloists. 9.15, News. 9.30, Reading of Prosper Merimee's Mateo Falcone (Danish Translation by K. King). 9.55, Dance Music by the Johansen Band, relayed from the Lodberg Restaurant. In the interval at 11.0, Time and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

## CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Talk: Old Cracow. 6.20, Miscellaneous Items. 6.25, See Warsaw. 9.0, Sports Notes. 9.10, Gramophone Concert. 10.5 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—10.30 to 11.30 a.m., Programme in English by the I.B.C. 10.30, Happy Hour. Part I. Orchestral Concert. Phileo Signature Tune; Anna (Lincke); Fairy Tale (Hoykens); Selection from Music in the Air; Pianoforte Solo, Dancing Butterfly (Young); Annual Antics (Wark); In Tulip Time beside the Water Mill (Ailbott); A Radio Roundabout (arr. Noack); The Valley of the Poppies (Ancliffe); Part II. Dance Music. I've found the Right Girl; Let's Call it a Day; Reflections in the Water; Tiek, Tiek; I'll show you off; Avalon; My Gipsy Rhapsody; Nobody's Sweetheart; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.30, I.B.C. Nursery Corner. 5.0, Concert for Working and Littlehampton Listeners. Accordion Band. Signature Tune. The Night by the Sea; Swanee (Gershwain); La Java de Doudonne (Padilla); Flor de Cuba (Conyers); Les bas a pointes (Lefebvre); God Black Mammy (Hill); Sweet Adeline (Armstrong); Spanish Sweetheart (Hargreaves); Whispering Waltz (Reeves). 5.30, Concert for Brighton and Hove Listeners. On the Beach at Waikiki; Weezy Anna; Tomi, Tomi; Cupid's Army (Sievier); Signature Tune. 5.45, Concert: Selection from He wanted Adventure (Waller); The Song of the Rose (McCulloch); Still I love her (Gaskill); Anna (Lincke). 6.0, Programme in French. 10.0 till Close Down, Programme in English by the I.B.C. 46.0 (approx.). Dance Music: Signature Tune. The Bells of Normandy; Isn't this a Night for Love; Bugle Call Rag; Aloha Oe; Sweep; Out in the Open; Sweep (Ellis); Stay out of my Dreams; Sing another Line; My Moonlight Madonna; From me to you; A Girl like Nina; Sophisticated Lady; Louisvillie Lady; Learn to Croon; F.C. 123; Don't blame me; Signature Tune. 11.0, Talk: Time: Times from the Talkies; Signature Tune. Sittin' in the Dark; Whistling under the Moon; I've found the right Girl; In a Year, in a Day; Sweetheart Darlin'; In the Moonlight; Learn to croon; Let the World go drifting by; Pianoforte Solo, Waltz Time Medley; Signature Tune. 11.30, Concert by the International Broadcasting Company (Ireland), Ltd., on behalf of the Irish Hospitals Sweepstakes Authorities: Signature Tune. Come back to Erin; Hungarian Dance No. 5 (Brahms); Minuet from the Petite Suite (Debussy); In the Hall of the Mountain King from Peer Gynt (Grieg); Slav Dance No. 10 (Dvorák); General Mulcahy March (Brace); Entry of the little Fauns (Pierne); One fine Day from Madame Butterfly (Puccini); Scarf Dance (Caminade); Signature Tune. Come back to Erin. 12.5 a.m. (Friday), News Bulletin in English. 12.10 (approx.). Club Concert for Morecambe and Carnforth Listeners: Signature Tune. The Chum Song; Honey-suckle Rose; Espanita; Fiddlin' Joes; Indiana; Really Blue; You've got me; Lazybones; Wedding of the Dragon Flies; Wood Violets; Sweet Dreams, Pretty Lady; Carry me back to green, green Pastures; Egypt; Sweetheart Darlin'; Peter, Peter; Signature Tune. 1.0, Dance Music: Signature Tune. The Bells of Normandy. Hold your Man; Oh Johanna! I'll take an Option on you; Ding, Dong, Ding; Blue Cloud; Come out Vienna; Then the Moon came out; Pink Elephants; Happy as the

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Day is long; Isn't it Heavenly; Mademoiselle; 'Twixt the Devil and the Deep Blue Sea; At the Old Pig and Whistle; My Wishing Song; Avalon; Signature Tune. 2.0, I.B.C. Good-night Melody and Close Down.

**FLENSBURG.**—See Hamburg.

**FLORENCE.**—See Turin.

**FRANKFURT**

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel; and Trier, 1,157 kc/s, 259.3 metres.—12.35 p.m., Gramophone Concert. Choral Prelude, Ich ruf zu dir Herr Jesu Christ (Bach), played by the Philadelphia Symphony Orchestra, conducted by Stokowski. Organ Solo: Prelude in G minor (Pachelbel); Choral from the Matthew Passion (Bach). Adagio molto from the String Quartet in F, Op. 59, No. 1 (Beethoven); Choral from The Messiah (Händel); Tone Poem, The Isle of Death (Rachmaninov), played by the Philadelphia Symphony Orchestra. 1.30 (from Cassel), Local News. 1.40, Songs by a Choir of the Hitler Jugend. 2.30, Weather. 2.40, Time and Exchange. 3.0 to 5.35, See Stuttgart. 5.35, Discussions: Persia, Imaginary and Real. 5.50, Weather and News. 6.0, Transmission for all German Stations relayed from Munich. 7.0, Topical Talk. 7.10, Masses for the Dead—Concert by the Station Orchestra and the Station Choir, conducted by Merten; Chorus from the German Requiem (Brahms); Extracts from Cantata No. 8 (Bach); Choral from Cantata No. 8 (Bach); Recitative Arioso and Choral from Cantata No. 60 (Bach); Four Extracts from the Requiem (Mozart); Piu Jesu, from the Requiem (Cherubini); Bass Solo: Confutatis from the Requiem (Mozart); Extracts from the German Requiem (Brahms). 9.0, Time and News. 9.20, See Stuttgart. 9.30, News and Weather. 9.45, Programme to be Announced. 11.0, See Langenberg.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., Variety Programme. 5.35, Review of the Musical Programmes for the Coming Week. 5.45, Frankfurt Exchange. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, Talk: The Peasant and the State. 7.15 (from Kiel), Allens ut Leev—Operetta in Three Acts in North German Dialect (Tews). 8.45, Topical Talk. 9.0, Time and News. 9.20, Organ and Violin Recital by Prof. Dettmer and Max Ladschek relayed from St. Paul's Church, Hanover. Fugue in A flat minor for Organ (Brahms); Slow Movement from the Violin Concerto (Brahms); Tocata (Michelangelo Rossi). 10.0, Dance Music by the Small Station Orchestra, conducted by Gerhard Maasz. Soloists: Gerhard Gregor and Gerhard Maasz (Pianofortes). 11.30 (approx.), Close Down.

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert: Organ Solos (Bach): (a) Prelude in G, (b) Fugue in G; Wanda Laudowska (Harpischord); (a) Minuet from Don Giovanni (Mozart), (b) Le tambourin (Rameau), (c) Rondo (Daquin); Harold Bauer (Pianoforte); The Sonata appassionata in F Minor (Beethoven); Music to a Japanese Marionette Play (Yoshitomo); Monte Cristo (Kottler); Overture, Poet and Peasant (Suppe); Accordion Duets (Johansen); (a) March, (b) Old Norwegian Hunting March; Two Pianofortes: Waltz, Kunstlerleben (Joh. Strauss); Four Pianofortes: American Fantasia (Gelbrunck). In the intervals at 12.20 p.m. and at 1.0, News. 1.30 (from Danzig), Exchange. 2.0, Exchange and Market Prices. 2.30, Programme for the Hitler Jugend: Some Königsberg Boys discuss Adolf Hitler. 3.0, Concert by the Small Station Orchestra, conducted by Eugen Wilcken: Overture, Iphigenia in Aulis (Gluck); Andante and Minuet from the Septet, Op. 20 (Beethoven); Selection from Der Waffenschmid (Lortzing); Overture Karneval in Rom (Strauss); Suite Campestre (Scassola); Selection from Der Tenor der Herzogin (Künneke). 4.35, Daniel Chodowiecki, a Polish Painter and Engraver of the Time of Frederick the Great—Talk in Connection with the Exhibition in the Schloss. 4.55, Song Recital for All Saints' and All Souls' Day by Gertrud von Borzestowski. Part I, Folk Songs: Maria durch ein' Dornwald ging; Maria ging aus wandern; Mein' Seel ist traurig ganz. Part II, Two Songs (Schubert): (a) Wehmüt, (b) Der Kreuzzug; Denk es, O Sella. 5.15, Agricultural Prices. 5.25, Agricultural Programme. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, News and Weather. 7.10 (from Danzig), Pianoforte Duet Recital: Sonata for Four Hands in D (Mozart); Sonata for Four Hands in B (Schubert). 7.50, Reading

from Die Jungfrau und die Nonne (Gottfried Keller). 8.10, Concert by the Small Station Orchestra and Soloists: Overture, The Daughter of the Regiment (Donizetti); Flute Solos: (a) Andante cantabile (Tchaikovsky), (b) Waltz No. 1 (Durand); Concertina for Oboe and Pianoforte (Flemming); Fantastic Waltz (Wilcken); Trumpet Solo, Song Birds of the Thuringian Forest (Hoch); Fantasia for Pianoforte and Orchestra, Wiener Bilderbogen (Börschel). 9.0, News, Weather and Sports Notes. 9.20, English Lesson for Beginners.

**HILVERSUM**

296.1 metres (7 kW up to 5.40 p.m.) and 20 kW from 5.40 p.m.—Programme of the General Broadcasting Company (A.V.R.O.). 7.40 a.m., Time Signal. 7.41, Gramophone Music. 9.40, Time Signal and Daily Service. 9.55, Gramophone Music. 10.10, Song Recital by Rita Oger. 10.40, Talk. 11.10, Song Recital. 11.40, Time Signal. 11.41, Concert by the Wireless Orchestra, conducted by Nico Treep. Soloist: Boris Lensky (Violin). Overture, Mignon (Thomas); Selection from La Bohème (Puccini); Zwanzietete (Lehár); Waltz (Rohrecht); Violin and Pianoforte Solos: (a) Cradle Song (Brahms), (b) Waltz in A (Brahms), (c) Syncopation (Kreisler); Selection from The Circus Princess (Kálmán); Die spieluhr der Pompadour (Noack); In the Temple of the Bells (Yoshitomo); In the Harbour of Port Said (Armandola); Violin Solos: (a) Melody (Rubinstein), (b) Serenade (Lehár), (c) Zardas (Keler-Bela); Waltz: An der schönen, grünen Narenta (Komzak); Diavoletta (Lindemann); Three Roses (Niël); Von Bühne zu Bühne (Fétras). 1.55 to 2.10 p.m., Interval. 2.10, Schubert Pianoforte Recital by Egbert Veen. Impromptu in B flat; Ecossaises; German Dances; Impromptu in F Minor. 2.40, Dressmaking Lesson. 3.25, Gramophone Music. 3.40, Programme for Hospitals. 4.10, Programme for Children. 5.10, Concert by the Wireless Orchestra, conducted by Nico Teep. Overture to a French Comedy (Keler-Bela); Russian Music (Bernards); Down South (Myddleton); Selection from The Bird-Fancier (Zeller); Baby Parade (Mannfred); Play of the Butterflies (Hefkens); (Lindsay-Thiemer); Jagdabenteuer (Schramme). 6.10, Talk on Sport. 6.40, Dialogue between Dr. A. Aljeckin (The Chess Champion) and Dr. Max Ewe, relayed from the Carlton Hotel, Amsterdam. 7.0, Gramophone Music. 7.10, English Lesson. 7.40, Time and News. 7.45, Gramophone Music. 7.55, Concert, relayed from the Concertgebouw, Amsterdam. The Concertgebouw Orchestra, conducted by Clemens Krauss. Soloist: Joseph Hofmann (Pianoforte); Overture, Pianoforte Concerto (Rubinstein); Thus spake Zarathustra (Richard Strauss); Dance from Salome (Richard Strauss). 10.10, Gramophone Music. 10.40, News. 10.50, Concert of Light Music. 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. until 3.40 p.m. Transmitted from Kootwijk, on 50 kW., from 3.40 p.m.—7.40 to 8.55 a.m., Programme of the Catholic Radio Society (K.R.O.). 7.40 to 8.55, High Mass, relayed from Weert. 9.40 to 10.40, Programme of the Christian Radio Society (N.C.R.V.). 9.40, Gramophone Music. 9.55, Religious Programme. 10.25, Gramophone Music. 10.40 to 1.40 p.m., K.R.O. Programme. 10.40, Gramophone Music. 11.10, Religious Address. 11.40, Police Announcements. 11.55, Gramophone Music. 12.10 p.m., Organ and Song Recital by Evert Haak and Boris Pelsky: Cortège funèbre (Dubois); Andant (Schumann); Songs: (a) Gedenke doch, mein Geist bei Zeiten, (b) Jesus ist das schönste Licht, (c) Jesu, Jesu, du bist mein, (d) Die gold'ne Sonne; Nocturne, Op. 15, No. 3 (Chopin); Gramophone Records; Marche funèbre (Chopin); Melody (Caplet); Meditation (Maillly); Inno a Maria Nostra Donna (Malipiero); Marche funèbre (Guilmant); Chant sérapique (Guilmant). 1.40 till Close Down. N.C.R.V. Programme. 1.40, Spare Time Hobbies. 2.40, Gramophone Music. 3.10, Interval. 3.40, Bible Reading. Baritone Solos, and Organ Solos. 4.40, Handwork for Young People. 5.10, Violin and Pianoforte Recital by Brederode and Pas: Sonata in G (Mozart); Sonata in D minor, Op. 103 (Reger); Gramophone Records; Poenetto for Violin and Pianoforte (Botti); Legenda for Violin and Pianoforte (Guerrini). 6.10, Police Announcements. 6.55, Religious Information. 7.10, Press Review. 7.40, Orchestral Concert, conducted by Hurk: Sursus Corda (Ruh); Fantasia (Ruh); Brüder seht die Bundesfahne (Müller); Hymn (arr. Rossmann); Potpourri (Ruh); N.C.R.V. Song; Talk; Schlaf wohl (Alt); Waldandacht (Weber); Adagietto religioso (Bohm); Intermezzo religioso (Frank); Prelude (Rachmaninov); Selection from the Suite algérienne (Saint-Saëns); Selection from Rigoletto (Verdi); Violin (concerto in A (Mozart); Symphony in B flat (Schubert); Overture, Oberon (Weber). In the interval at 8.40, Talk, and at 9.40, News. 10.40,

Gramophone Music. 11.10 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, Financial Notes, Racing Results and News. 8.10, Fashion Review. 8.20, Radio Concert. In an interval at 8.45, News and Weather.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—11.0 a.m., 12.25 p.m., Programme for Frankfurt. 12.25, News and Weather. 12.35, See Frankfurt. 1.30, Talk. 1.45, Concert of Chamber Music by Ermuthe Wiebiger (Contralto), Grote (Cello), and Jansen (Harmonium); Andante cantabile (Birkenstock); Aria (Tenaglia); Allerseulen (Richard Strauss). 2.5, Review of New German Anthologies. 2.10, Reading (Schäferdick). 2.30, Economic Notes. 2.50, Political Address. 3.0, See Stuttgart. 5.35, Reading: Van der Schönheit des neuen Vaterlandes (Ludwig Friedrich Barthel). 5.50, News. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, See Frankfurt. 9.20, See Stuttgart. 9.30, News. 9.40, Gramophone Music. 10.0, Programme to be announced. 11.0, Concert of Chamber Music by the Cologne Viola Ensemble. Haas (Harpischord) and Marga Bäume (Lute). Fantasia for Three Violas (Gibbons); Two Fantasia for Four Violas (Isaac); Fantasia for Four Violas (Vaet); Pieces for Four Violas from Abdelazer (Purcell); Suite for Four Violas and Lute (Pezel); Two Fugues in A and B Minor for Four Violas; Two Fugues for Four Violas, from Die Kunst der Fuge (Bach); Sonata in C for Two Violas, Cello, and Harpischord. 12.0 Midnight, Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m., Weather and Time. 11.5, Concert by the Emde Orchestra. March, Blau Jung's (Ludwig); Spanish Comedy-Overture (Keler-Bela); Revue (Cerril); Waltz, Fideles Wien (Komzak); Intermezzo (Gorf); Serenade, Anita (Meisel); Prasant Suite (Ailbott); Gavotte in D (Gossec); Waltz, Intermezzo, Symphenreigen (Gutzit); Selection from Firenze ridente (Raffaelli); Intermezzo, Pudelchen (Flügge); March, Sternengold (Jacob Christ). 12.15 p.m., News and Programme Announcements. 12.30, Concert of Chamber Music by Montag-Egger (Mezzo-Soprano), Haustedt (Violin); Wawrowsky (Cello), and Nestmann (Pianoforte); Trio for Violin, Cello and Pianoforte, Op. 18, Nordische Lieder (Hillmann); Three Songs (a) Die Rose (Görner), (b) Die schöne Nacht (Reichardt), (c) Malled (Schulz); Trio in G for Pianoforte, Violin and Cello, Op. 5 (Eberhard); Three Songs: (a) Das Rosenband (Zelter), (b) Ein kleines Haus (Haydn), (c) Die Sendung (Himmel); Lyric Waltz for Violin, Cello and Pianoforte, Op. 96a (Sikelius). 1.15, News. 1.30, Film Review. 2.0, Talk for Young People. 2.35, Market Prices. 3.0, Concert of Classical Dances by the Symphony Orchestra, conducted by Hilmar Weber. Part I: Dances from Symphonies; German Dance and Polonaise from the Carnival Symphony (Bittersdorf); Ballet Music (Berlioz); Minuet (Haydn); Waltz from Symphony, No. 5 (Tchaikovsky); Saltarello from the Italian Symphony (Mendelssohn); Furiant from Symphony, No. 1 (Dvorak). Part II: Dances from Suites, Courante, Sarabande, Gavotte and Bourée, from Suite No. 1 (Ambrosius); Mazurka, from Scenes de Ballet (Glazunov); Bolero, from Bilder aus dem Süden (Niéod); Tango from the Little Suite from the Musi to Donna Diana (Niemann); Seguedilla and Tarentella (Reifmann); Potpourri from the Suite Bunte Reigen (Moellendorf). 4.30, Book Review. 5.0, Talk: The Old Germanic Temple Waffelre. 5.45, Economic Notes and News, followed by Review of the Day. 6.40, Transmission for all German Stations, relayed from Munich. 7.0, Symphony Concert of Music by Bach, Handel and Mozart, by the Cologne Chamber Music Orchestra, relayed from the Gewandhaus. Conductor: Hermann Abendroth. 8.0, Accordion Recital by the Two Sewalds. March, Die Regiment-skinder (Fueick); Prelude (Rachmaninov); Verdi Potpourri; Hungarian Comedy Overture (Keler-Bela); Waltz, The Blue Danube (Strauss); Allegro from the Overture, William Tell (Rossini). 9.0, News and Sports Notes.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—5.0 p.m., Educational Talk. 5.30, The Letter Box.

6.0, Serbo Croat Lesson. 6.30, Request Gramophone Records. 7.0, Programme relayed from Belgrade. 9.0, Weather, News and Gramophone Music. 10.0 (approx.), Close Down.

**LUXEMBOURG**

352 kc/s, 1,191 metres; 200 kW. German Evening.—7.0 p.m., Double Concerto in A minor, Op. 102 (Brahms), on Gramophone Records. 7.40, Topical Talk. 7.50, Song Recital by Marie-Thérèse Grosfills de Cuyper: Die Lotushblume (Brahms); Maria Wiegenglied (Reger); Verborgenheit (Wolf); Panis angelicus (César Franck); Ave Maria (Schubert). 8.20, Concert by the Radio Orchestra, conducted by Henri Pensis: Overture, Egmont (Beethoven); Eine kleine Nachtmusik (Mozart); Prelude (Rachmaninov). 8.50, News in French. 9.0, Concert (contd.); Pianoforte Concerto in A (Liszt); Prelude to The Mastersingers (Wagner). 9.45, News in German. 9.55, Gramophone Records: Requiem (Verdi), by the Orchestra, Chorus, and Soloists of the Scala, Milan.

**MADRID**

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Programme relayed from Madrid (EAJ7), followed by Radio Chronicle. 12.30 Midnight to 12.30 a.m. (Friday), Programme in English by the I.B.C. Concert: Kissing is no Sin; Humming to myself; Garbo Gitano; Pa mías Igual; A Penny for your Thoughts; Selection from Congress Dances; That's my Home; Selection from A; Waltz Dream. 12.30, I.B.C. Goodnight Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Announcements and Programme for Children. 8.15, Topical Review. 8.30 to 9.15, Interval. 9.15, English Lesson. 9.30, Chimes, Time and Topical Review. 9.45 (approx.), Dramatic Programme. 11.45, Topical Review. 12 Midnight, Chimes. 1.0 to 2.0 a.m. (Friday), Programme in English by the I.B.C. Popular Music: Blue Prelude (Bishop); Remember my forgotten Man (Dubin); Two of Irish (Whitlock); Lady play your Mandoline (Leoant); Pettin in the Park (Dubin); The School Song (Hargreaves); Sweetheart Darlin' (Kahn); It's time to sing Sweet Adeline Again (Davis); Let's try again (Newman); Lay your head on my Shoulder (Coslow); You're charming (Turk); Parade of the Minute (Myers); I've got the World on a String (Loehler); The Song of a Slave (Grener); Step Lightly (Anderson); Waltzing in a Dream (Crosby). 2.0, I.B.C. Goodnight Melody and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—5.30 p.m., German Transmission: Talk: How Large is the World, followed by Theatre and Film Review. 5.50, See Prague. 10.10 (approx.), Close Down.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather. 1.45 p.m., Weather. 2.0, Brahms, Schubert and Dvorak Concert by Matkovski (Cello), Moronov (Pianoforte), Zuckermann (Clarinet), Karevitch (Violin), and Turgaieva (Soprano). 3.0, English Lesson. 3.30, A Play (Heine), with Music by Vlassov, followed by Reading. 4.30, Programme for Children. 5.30, Concert of Chamber Music: Borissovsky (Viola), Walter (Pianoforte); Indina (Pianoforte) and the Trio; Gutmann (Pianoforte), Bondarenko (Violin) and Gaergian (Cello). 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserlautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Orchestral Concert, conducted by Alois Detzer; Overture, Die beiden Lusaren (Doppler); Selection from La montagne noire (Holmes); Turkish Suite (Gaubwin); Waltz (Friedemann); Harlekins (Stauden); Dreyer; Selection from Donnerwetter tadellos (Lincke); Zigeunerstädchen (Nehl); Intermezzo, Kupido und Schmetterling (Albrecht). 4.45, Talk: All Souls' Day (Celebrations in the Country. 5.5, Sacred Concert by a Girls' Choir and Elizabeth von Pander (Mezzo-soprano). 5.25, A Dialogue: War Reminiscences of 1917. 5.45, Time, Weather and Agricultural Report. 6.0, Transmission for all German Stations; Sacred Concert for All Souls' Day. 7.0, Germany and Austria—Reading from Gärungen-Klärungen (Gerhold). 7.15, Orchestral Concert, conducted by Hans Winter. Soloist: Irma Drummer (Contralto). Requiem for Solo Voice, Mixed Choir and Orchestra (Reger); Symphonic Poem: Death and Transfiguration (R. Strauss). 7.45, Organ and Soprano Recital by Gustav Schoedel and Margot Leander; Passacaglia in D minor (Kerri); Three Songs: (a) Ein Halmlein wächst auf

NOV. 2nd THURSDAY continued

Edren (Friedemann-Bach), (b) Allerseelen (Schubert), (c) Ihr habt nun Traurigkeit, from the Requiem (Brahms); First Movement from the Präludium in B minor, Op. 142 (Rheinberger). 8.5, Programme to be announced. 8.15, Miniatures Concert by the Small Station Orchestra conducted by Erich Kloss. Soloists: Hugo Reker (Violin) and Georg Troibner (Cello). 9.0, Time and News.

NAPLES.—See Rome. NOTODDEN.—See Oslo.

OSLO

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 622 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Concert by the Theatre Café Orchestra, conducted by Nielsen: March, Soldatenblut (von Blon); Waltz, Die Schönen von Valencia (Morena); Overture and Siciliana from Cavalleria rusticana (Mascagni); Polish Dance (Scharwenka); Ich liebe dich (Grieg); Erotik (Grieg); Overture, Lysistrata (Lincke); Allegro for Violin (Pezze); Selection from The Pearl Fishers (Bizet); Mjaeresten min (Johansen); Waltz, Memories (Lubbe); March, Les Banderilleros (Volpatti). 5.0, German Lesson. 5.30, Talk: The Norwegian Churches during the Past Four Centuries, relayed from Trondheim, 605 kc/s, 495.8 metres. 6.0, Announcements, Weather and News. 6.30, Concert of Norwegian Music, relayed from Bergen, 825.5 kc/s, 636.6 metres. 7.0, Time Signal. 7.1, Agricultural Talk. 7.30, Pianoforte Recital by Rolf Brandt Bantzau: Polonaise Fantaisie (Chopin); Berceuse (Chopin); Were I a Bird (Henselt); Venezia e Napoli (Liszt); Tarantella (Liszt). 8.0, Talk. 8.20, Announcements. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Song Recital. 9.45 (approx.), Close Down.

OSTERSUND.—See Stockholm.

PALERMO

558 kc/s, 537.6 metres; 3 kW.—All Souls' Day.—7.0 p.m., Giornale Radio and Announcements. 7.30, Carillon for All Souls' Day, relayed from Rovereto.

PARIS

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 15 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals).—5.45 p.m., Le Journal Parlé. 7.30, Gramophone Concert: Gregorian Chants; Requiem (Fauré); Organ Solo: Toccata (Rossi); Prelude and Fugue (Bach); Ave Maria (Gounod); Ave Maria (Schubert); Second Movement from the Third Musical Symphony (Beethoven); La voix des cloches (Luigini). 9.0 (approx.), Close Down.

PARIS

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Agricultural Talk. 7.10, Le Journal Parlé. 7.30, Programme for Children. 8.0, Talk. 8.5, Topical Talk. 8.20, Interval. 8.35, Voices of the Dead—Gramophone Records of Caruso, Noté, Marcel Journet, Sarah Bernhardt, Sylvain, Maurice de Féraudy and Madeleine Roch. 9.20, Interval. 9.40, Quartet Op. 40 (Debussy). 10.40, News.

PARIS

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture (contd.). 7.45, Extracts from the Music to Le; Erynie (Massenet) on Gramophone Records. 8.0, News. 12 Noon, Protestant Address: All Souls' Day. 12.30 p.m., Gramophone Concert: Part I—Chamber Music: Concerto for Strings. No. 2 in F (Händel); Charles Panzoro Song (Beethoven); Yehudi Menuhin Te Deum (Handel); Ninon Vallin: Death and the Maiden (Schubert); Arthur Schnabel: Pianoforte Sonata No. III (Beethoven). Part II—Sacred Music: Songs by the Sistine Choir: (a) Ave Maria (Arcadelt), (b) Introitus (Anerio), (c) Super flumina (Palestrina), (d) Benedictus (Perosi), (e) Improperia (Palestrina), (f) Tenebrae (Vittoria); Choral in A Minor for Organ (Franck). In the intervals at 1.0, Exchange and News, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 6.20, Agricultural Talk. 6.45, Legal Talk. 7.0, Talk. 7.20, Gramophone Music: Potpourri of Old French Songs; Songs by Bob and Bobette (Zimmermann); La cage de cristal (Ibert); Le petit âne blanc (Ibert); Le p'tit Quinquin (Desrousseaux). 7.45, Press Review in German. 8.0, The Polish Jew—Play (Eckmann-Chatrjian). In the intervals at 8.30, News; at 8.40, Review by Bonnaud; and at 9.15, Press Review and News.

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.86 metres and 25.27 metres.—7.0 p.m., Musical Originalities, from New York. 7.30, Pioneers, KDKA to New York. 7.45, KDKA Home Forum. 8.0, Programme to be announced. 8.15, Quilting Party. 8.20, Words and Music, from New York. 8.45, Federation of Pennsylvania Women. 9.0, Betty and Bob, from New York. 9.15, Programme to be announced. 9.30, News and

Markets. 9.45, Thursday Special, from New York. 10.0, Federation Women's Club from New York. 10.15, KDKA Kiddies Klub. 10.30, Singing Lady, from New York. 10.45, Orphan Annie, from New York. 11.0, News, Piano Classique. 11.15, Sports, Pat Haley. 11.30, Pittsburgh Spotlight. 11.45, Lowell Thomas, from New York. 12 Midnight, Amos 'n' Andy, from New York. 12.15 a.m. (Friday), Marvellous Melodies. 12.30, Programme to be announced. 12.45, Pathé News of the Air. 1.0, Captain Diamond, from New York. 1.30, Adventures in Health, from New York. 1.45, Crooning Choir. 2.0 to 3.0, New York Relay. 2.0, Death Valley Days. 2.30, Lady Esther Serenade. 3.0, Hands across the Border.

PORSGRUND.—See Oslo.

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Bratislava. 3.50, See Brno. 4.15, Talk on Economics. 4.25, Gramophone Music. 4.35, French Lesson. 4.50, Gramophone Music. 5.5, Gardening Talk. 5.15, Talk for Workers. 5.25, News in German. 5.30, German Transmission: Topical Talk and Agricultural Report. 5.50, News. 6.0, Time Signal. 6.1, Talk: How National Characteristics are expressed in the Language. 6.15, Talk on the following Transmission. 6.30, Il Trovatore—Opera in Four Acts (Verdi), relayed from the German Theatre. 9.0, Time and News. 9.20, Talk on the following Transmission in Czech, German and French. 9.35, Trio in G minor, Op. 15 (Smetana). 10.10 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics. 11.28, Time Signal from Neuchâtel Observatory. 11.30, News and Weather. 11.40 (from Geneva), Variety Items. 12 Noon (from Geneva), Financial News. 12.10 p.m. (from Geneva), Gramophone Concert: Potpourri, Servus Wien (Dostal); Duets from Don Pasquale (Donizetti), and Aida (Verdi). Guitar Solos: Overture, Oberon (Weber). 1.0 to 1.58, Interval. 1.58, Time Signal from Neuchâtel Observatory. 3.0 (from Geneva), Gramophone Concert. 4.0 (from Geneva), Concert. 5.0 (from Lausanne), Talk: Wheat and Flour. 5.30 (from Lausanne), Sports Talk. 5.55 (from Lausanne), Theatre Notes. 6.20 (from Lausanne), Tourist Report. 6.30 (from Lausanne), Agricultural Talk. 7.0 (from Lausanne), Cello Sonata in G minor, Op. 5 (Beethoven), by Paul Burger (Cello) and Mme. Gayros-Derancesco (Pianoforte). 7.30 (from Lausanne), Song Recital by Madeline Marthe: Wiegenlied (Mozart); Wiegenlied (Wolf); Lullaby (Clutsam); Lullaby (Greehaninov); Après un rêve (Fauré); Solveig's Song (Grieg). 8.0, Concert by the Radio Orchestra, conducted by Robert Echenard. 9.0, News and Weather. 9.10 (from Geneva), Talk: The Work of the League of Nations. 9.30 (approx.), Close Down.

RJUKAN.—See Oslo.

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres; and 2RO, 11,810 kc/s, 25.4 metres. All Souls' Day.—7.15 a.m., Time, Giornale Radio, and Announcements. 7.0 p.m., Time, Announcements, and Giornale Radio.

SALZBURG.—See Vienna.

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres and by W2XAD on 19.56 metres.—12.45 a.m. (Friday), Stock Reports. 1.0 to 4.0, New York Relay. 1.0, Rudy Vallee's Orchestra. 2.0, Captain Henry's Show Boat. 3.0, Al Jolson, Paul Whiteman's Orchestra. 4.0, Programme Résumé.

SCHWEIZERISCHER LANDESENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne), Gymnastics. 11.0 (from Zürich), Talk for Housewives. 11.5 (from Zürich), Concert by the Small Station Orchestra, conducted by Scherbaum. 12.25 p.m. (from Zürich), Time, Weather and Exchange. 12.30 (approx.) to 2.30, Interval. 2.30 (from Berne), Glee (on Gramophone Records). 3.0, See Radio-Suisse Romande. 5.0 (from Basle), American Music on Gramophone Records. 5.30 (from Basle), Anecdotes of Gold-diggers. 6.0 (from Basle), Time, Weather and Traffic Report. 6.5 (from Basle), Basle Fair—Gramophone Concert with Commentary. 6.50, (from Basle), A Dialect Play in Three Acts (Paul Lang). 8.0, Weather and News. 8.10 (from Basle), Chamber Music. 9.15 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

STOCKHOLM

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,328 metres; Östersund, 389 kc/s, 770 metres, and Sundsvall, 554 kc/s, 542 metres.—4.5 p.m., Divine Service. 4.30, Programme for Children. 4.45, (Concert of Light Music. 5.15, Gramophone Music. 5.45, Elementary English Lesson. 6.15, Weather and News. 6.30, Science Talk. 7.0, Choral Concert, conducted by Einar Ralf. 8.15, Literary Review, relayed from Uppsala, 662 kc/s, 453.2 metres. 8.45, Weather and News. 9.0, Light Music relayed from the Berne Hall: Overture, The Siege of Corinth (Rossini); Waltz, Die Schönbirner (Lanner); Verdi Potpourri (Rhode); Melody (Blauw); Chant russe (Lalo); Melody (Ray); Military March (Grit). 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Concert: The Unfinished Symphony (Schubert); Aria from La Rédemption (Franck); Lamento and Chanson triste (Duparc); Death of Isolde, from Tristan and Isolde (Wagner); Cloches des Morts (Ropartz); Pie Jesu (Fauré); Our Father (Busser); Eneantement (Massenet); Overture, Patrie (Bizet). 12.45 p.m., News. 1.0, Time and Exchange. 1.15, Orchestral Concert, conducted by de Villers: Tragic Overture (Brahms); Symphonie Piece from La Rédemption (Franck); Pastorale (Franck); Allerseelen (Richard Strauss); Harre, meine Seele (Richard Strauss); La Procession nocturne (Rabaud); Pavane pour une Infante défunte (Ravel). 2.0, Programme for Children. 3.0, Interval. 3.45, Elocution Lesson. 4.0, Programme for Children, relayed from Bordeaux-Lafayette. 5.0, Talk in German: Great Frenchmen. 5.15, Talk for Women. 6.30, Orchestral Concert, conducted by de Villers: Prelude to Lohengrin (Wagner); Selection from The Flying Dutchman (Wagner); Suite No. 1 from L'Arlesienne (Bizet); Selection from The Pearl Fishers (Bizet); Funeral March (Tchaikovsky). 7.30, Time and News. 7.45, Gramophone Music. 8.0, Press Review in German, Lottery Results, and Announcements. 8.30, (Concert by the Union Music Society, relayed from the Salle des Catherineles, Colmar: Concert Overture, Wilhelmine (Boyer); Scènes pittoresques (Masselet); Selection from La belle Héloïse (Offenbach); Descriptive Suite, Au Pays basque (Fernand); Florentine March (Fueki). In the interval at 9.30 (approx.), Press Review. 10.30 (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.25 p.m., Local News and Weather. 12.35, See Frankfurt. 1.30 to 2.0, Interval. 2.0, Programme for Young People. 3.0, Concert by the Station Orchestra, conducted by Gustav Görlich. Soloists: Willy Kleemann (Violin), Hans Reichardt (Violin), Hans Köhler (Viola), Ferdinand Merten (Cello), Arthur Faiss (Guitar), and Otto Seyfert (Harpischord); Prelude for Strings (Bach); Concerto for Harpischord and Orchestra (J. Chr. Bach); Partita for String Quartet and Guitar; Sinfonia (Friedemann Bach); Choir: Komm, süsßer Tod (Bach); Ricercra for String Quartet and Guitar (Steigleder); Choir: Selig sind die da Leid tragen (Brahms); Three Pieces for String Quartet and Guitar (Bach): (a) Aria, (b) Lamentoso, (c) Fantasia; Reigen seliger Geister (Gnek). 5.0, Spanish Lesson. 5.20, Talk on the Swabian Artist Johann Heinrich Dannecker, on the One Hundred-and-Seventy Fifth Anniversary of his Birth. 5.35, Talk on Fritz Reuter. 5.50, Time, Market Prices and Weather. 6.0, Transmission for all German Stations, relayed from Munich. 7.0, See Frankfurt. 9.20, Topical Talk. 9.30, Local News, Weather and Sports Notes. 9.40 (approx.), See Langenberg. 12 Midnight (approx.), Close Down.

SUNDSVALL.—See Stockholm.

TOULOUSE

RADIOPHONIE DU MIDI, 779 kc/s, 385 metres; 8 kW.—6.0 p.m., News. 6.15, Viennese Music. 6.45, Opera Music: Prayer and Chorus from Lakmé (Delibes); Aria from Thais (Massenet); Dieu qui fit l'homme a son image from Romeo and Juliet (Gounod); Barcarole from The Tales of Hoffmann (Offenbach). 7.0, Organ Solos. 7.15, News, Racing Results, and Market Prices. 7.30, Light Music: Paysage (Hahn); Clair de lune (Fauré); Wiegenlied (Mozart); L'Angelus de la mer (Goublier). 7.45, Petite Suite (Debussy) by the Symphony Orchestra. 8.0, Opera Music: Romance de la Sauge from Le Jongleur de Notre Dame (Massenet); Misereere from Il Trovatore (Verdi); Prayer from William Tell (Rossini); Aria from Herodiade (Massenet). 8.15, Orchestral Music: Sanctuary of the Heart (Kütelberg); Cavatina (Raff); Spring Song (Mendelssohn); Hungarian Dance No. 6 (Brahms).

8.30, Sound Film Music. 8.45, Military Music. 9.0, Cello Concerto (Dvorak). 9.30, Operetta Music. 9.45, Orchestral Concert: Capriol Suite (Warlock); Ave Maria (Bach-Gounod); Fugue (Bemers); Funeral March (Chopin); Selection from La Navarraise (Massenet); Death of Ase, Peer Gynt (Grieg). 10.15, North African News. 10.30, Concert for Listeners in Morocco: Lake Como (Galos); Le soir (Fauré); In a Chinese Temple Garden (Kettelberg); Chorus from Cavalleria rusticana (Mascagni); Overture, Oberon (Weber); La Ronde des heures (Sylviano). 11.0, Choral Music. 11.15, Dance Music. 12 Midnight, News, Weather, and Announcements. 12.5 a.m. (Friday), Chansonnettes. 12.15, Military Music. 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—All Souls' Day.—7.0 to 7.20 a.m., See Turin. 11.45 a.m. to 12.5 p.m. (approx.), See Turin. 7.0, See Turin.

TRONDHEIM.—See Oslo.

TURIN

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—All Souls' Day. 7.0 to 7.20 a.m., Time, Giornale Radio and Market Prices. 11.45, Giornale Radio and Exchange. 12 Noon, Time and Announcements. 7 p.m., News. 10.0, Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15 a.m., Religious Information in French. 7.0 to 7.15 p.m., Religious Information in Italian.

VIENNA

581 kc/s 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—10.30 a.m., Concert by the Wiener Symphoniker, conducted by Max Schönherr: Hamlet Overture (P. E. Bach); Haydn Fantasia (Urbach). 10.55, Weather. 11.0, Concert (contd.): Overture, Athalia (Mendelssohn); Valse triste (Sibelius); Gavotte der Königin (Joh. Strauss); Mazurka, Die Libelle (Joh. Strauss); Abschiedswalzer (Joh. Strauss); Harfners Abendgesang (Kienzl); Ave im Kloster (Kienzl); Abendstimmungen (Kienzl); Overture, Ein feste Burg ist unser Gott (Nicola). 12 Noon Time and News. 12.10 p.m., Gramophone Concert: Alfred Sittard's Organ Solo, Toccata and Fugue in D minor (Bach); Chalapin: Song, The Prophet (Rimsky-Korsakov); Anne Roselle: Ave Maria from Othello (Verdi); Josef Manowarda: Ballad, Die Uhr (Loewig); Alfred Cortot and the London Symphony Orchestra, conducted by Landon Ronald: Symphonie Variations (Franck); Alfred Piecaver: Ingeniciso from the Requiem (Verdi). 1.0, Interval. 2.0, Time and News. 2.20, Hints for Housewives. 2.30, Talk: St. Pölten. 2.50, Programme for Women. 3.5, Chorus and Ensemble Music from Italian Opera—Gramophone Concert: Chorus from La Bohème (Puccini); Quintet from A Masked Ball (Verdi); Love Duet from Madame Butterfly (Puccini); Sextet from Lucia di Lammermoor (Donizetti); Finale from Tosca (Puccini); Duet from Aida (Verdi); Quartet from Rigoletto (Verdi). 3.50, Talk: All Souls' Day—Song Recital by Josef Papier (Bartolome); Songs (Schubert): (a) Der Wegweiser, (b) Das Wirtshaus, (c) Das stille Land, (d) Die Nebensonne, (e) Song, (f) Himmelsfunken, (g) Wehmüt, (h) Litanei; Gute Nacht (Franz); Ein Friedhof (Franz); Songs (Brahms): (a) Über die Haide, (b) Ein Wanderer, (c) Romance No. 11 from the Magelone, (d) Auf dem Kirchhofe. 4.55, Talk: Autumn. 5.20, Reading. 5.50, Theatre Review. 6.0, Chamber Music by the Rosé Quartet and Alfred Rosé (Pianoforte): Quartet in D minor, Death and the Maiden (Schubert); Pianoforte Quintet in E flat Op. 44 (Schumann). In the interval at 6.35, Time and News. 7.10, Topical Talk. 7.25, Die Sündflut (The Flood) Play (Barlach). 9.15, News.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Chimes from the Tower of St. Mary's Church, Cracow. 11.5, Gramophone Music. 11.35, Weather. 11.38, Gramophone Music. 12 Noon, Interval. 2.30, Talk on Economics. 2.40, Trio in A Minor (Tchaikovsky). 3.40, Talk for Women. 3.55, Organ Recital by Rutkowski, relayed from the Conservatoire: Choral (Bach); Prelude and Fugue in C Minor (Bach); Variations (Liszt); Fantasia on a Hymn (Surzysky). 4.50, Programme for Young People in the Country. 5.0, Talk on The Catacombs of Rome, relayed from Lwów, 788 kc/s, 381 metres. 5.20, Dramatic Programme. 6.5, Miscellaneous Announcements. 6.25, Topical Talk. 6.40, Programme Announcements. 6.45, Radio Journal. 7.0, Les Visions (Moniuszko), by the Lutnia Choir, conducted by Maszynsky; Soloists, Mokrzycka, Karowska, Wrago, and Michalowsky. 9.0, Sports Notes. 9.10, Gramophone Music. 10.0, News, Weather, and Police Notes.

ZURICH.—See Schweizerischer Landessender.

# FRIDAY

## NOVEMBER THE THIRD

### ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations and Gramophone Concert. 6.0, Programme for Children. 6.45, News. 7.0, Gardening Talk. 7.15, Literary and Dramatic Talk. 7.30, Time Signal. 7.31, Orchestral Concert. 8.0, Pianoforte Recital by Carmel Turner. 8.15, Gaelic Song Recital. 8.30, The Station Orchestra. 8.45, A Dramatic Sketch, by T. Young and Company. 9.15, Gaelic Song Recital. 9.30 to 10.30, Programme by the I.B.C. (Ireland). Ltd. 9.30, Concert: Light Orchestral Music: Phantom Brigade (Myddleton); Cuckoo Waltz (Jonasson); Lucky Xylophone (Huss); Love in Cloverland (Peter); Spanish Gipsy Dance (Marquiva); Xylophone Solo, Aeroplane Polka (Gaston); Song, Smilin' Through (Penn); Ke-sa-ko (Chapman). 10.0, Concert arranged by the International Broadcasting Company (Ireland). Ltd. Amorette-tanz (Gangl); Xylophone Solo, The Dripping Well (Abbey); Selection, The King of Jazz (arr. Somers); Racing Commentary; Pianoforte Solo, Keyboard Kapers (Steele); Harlequinade (Pepper); Selection of Musical Gems (arr. Shalmar); Très jolie (Waldteufel). 10.30, Time, News and Weather. 10.40, Traditional Fiddle Solos by C. O'Brien. 10.50, Accordion Solos by J. Carey. 11.0 (approx.), Close Down.

### BARCELONA

EAJI, 860 kc/s, 348.8 metres; 8 kW.—6.0 p.m., Trio Concert: Selection from Carmen (Bizet); Minuet from the Sonata No. 11, Op. 22 (Beethoven); Serenade (Sandereson); Intermezzo (Malvezzi); Valse lente in A minor (Chopin); La vieille boîte à musique (de Severac); Selection from Rigoleto (Verdi). 7.0, Request Gramophone Records. 7.30, Exchange and Request Gramophone Records. 8.0, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Messages to Seamen, Exchange and Market Prices. 9.10, Concert by the Radio Orchestra: March, Sempre avanti (Eucik); Selection from La verbena de la Paloma (Breton); Zambra, En la Rometria del Rocío (Barrios); Popular Songs (Rodríguez Rosés); Intermezzo (Colotta); Overture, King Stephen (Beethoven). 10.0, Violin and Pianoforte Recital. 10.30, Dance Music relayed from the Case Libre. In the interval at 11.0, News. 11.30, Gramophone Music.

### BARI

1,112 kc/s, 269.8 metres; 20 kW.—3.30 p.m., Gramophone Music. 3.55 to 5.0, See Rome. 5.35, News in Albanian. 5.45 till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

### BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—3.0 p.m., Gramophone Music. 3.30, Gymnastics for Children. 4.0, French Lesson. 5.55, Time Signal and Programme Announcements. 6.0, Concert by the Station Orchestra. 7.0, Programme from Zagreb, 977 kc/s, 307 metres. 9.0, Time and News, followed by Dance Music from the Zanatski dom Restaurant.

### BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—11.0 a.m., Weather for Farmers. 11.5, Gramophone Concert: Overture, Abu Hassan (Weber); Im Feld des Morgens früh (Bunckhardt); Selection from La Bohème (Puccini); Serenade from I Pagliacci (Leoncavallo); Luna-Walzer (Lütke); The Angel's Serenade (Braga); The Wedding of the Winds (Hall); Monat-rose (Eisenburg); Moonlight on the Alster (Petras); Serenade from Les Millions d'Arlequin (Drigo); Chinese Street Serenade (Sledzi); Gesellschaftstrolche (Lindemann); Kannst du mein Liebeslied? (Drlla); Glückliche Reise (Künneke). After the Concert, Weather. 11.55, Time Signal. 12.45 p.m., News. 1.0, Dance Music on Gramophone Records. 2.0, A Dialogue for Girls. 2.30, Weather and Exchange. 2.45, Reading (Goethe). 3.0, See Leipzig. 4.0, Talk: Peasant Customs and Schools. 4.25, Pianoforte Recital by Max Nahrath: Variations on the Folk Song, Prinz Eugen (Nahrath); Im Traum (Unger); Japanisches Hockenspiel (Petyrek); Die Clucken der Pagode (Niemann); Paradiesvogel am Wasserfall (Niemann); Blühende Lianenranken (Niemann); Kolibri (Niemann); Jeux d'eau (Ravel). 5.0, A Poem. 5.5, Talk: Women, Race and the Nation. 5.20, Talk in Dialect. 5.35, A Dialogue between two Girl Students. 5.45, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Today's Motto. 7.5, Concert by the Station Orchestra, conducted by Edwin Lindner; Soloists, Marta Lütz (Violin) and Nina Lützow (Soprano); Violin Concerto in G Minor (Brahms); Suite in A Minor (Sinding); Soprano Solos: (a) Lisa's Aria from The Queen of Spades (Tchaikovsky); (b) Aria from Nerone (Boito); Selection from Tristan and Isolde (Wagner). In the interval at 8.0 (approx.), A Dialogue: The Parachute. 9.0, News. 9.45, Weather. 10.5, See Breslau. 11.0 (approx.), Close Down.

### BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW.—6.0 p.m., Transmission for all German Stations; Programme of Addresses and Orchestral Music. 7.5, Humorous Discussion: Screen-stories, the German Mark Tapley in Fact and Fiction. 7.45, Topical Talk. 8.0, Concert of Modern Italian Music by the Station Orchestra, conducted by Oreste Piccanti. Soloist: Adelheid Arnholt (Soprano). Overture (Petras); Partita (Dallapiccola); Divertimento (Mussino); Italian Symphony (Veretti). 9.0, Weather and News. 9.15 (approx.), Dance Music by the Eugen Jahn Band. 11.0 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm.

BODO.—See Oslo.

### BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW. 6.15 p.m., Radio Journal. 7.35, News. 7.40, Educational Report. 7.55, Lottery Results. 8.0, Spanish Lesson. 8.15, News. 8.30, Concert by the Symphony Orchestra and Soloists.

### BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—6.0 p.m., See Prague. 6.10, Gramophone Music. 6.25, See Prague. 9.30 (approx.), Close Down.

BREMEN.—See Hamburg.

### BRESLAU

923 kc/s, 325 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.5 p.m. (approx.), Gramophone Concert of Classical Music. 12.45, Time and News. 1.10, Gracner Violin and Pianoforte Recital by Margot Hesse and Marta Kintzel-Hübner; Pianoforte Solo: Intermezzo, Op. 77, Nos. 1 and 2; Violin and Pianoforte: Sonata, Op. 56; Pianoforte Solo: Intermezzo, Op. 77, No. 3. 1.40, Programme arranged by the Post Office, with Gramophone Records. 2.0, Agricultural Prices. 2.15, Programme for Young People. 2.45, Reading (Ewald Schild). 3.0, Concert by the Station Orchestra, conducted by Ernst Josef Topfitz: Overture, The Bohemian Girl (Balfe); Romantic Suite (Armandola); Venetian Serenade (Hellmeberger); Doriarischen Brautnacht (Riende); Waltz, Paradiesreigen (Nedbal); Selection from Das Pensionat (Suppe); Intermezzo from Si (Masagani); Kinder spielt's ma Weanertanz! (Drescher); Operetta Revue (Petras). 4.30, Agricultural Prices. 4.35 (approx.), Two Short Stories (Wilhelm Schmidhohn). 5.0, Programme to be announced. 5.30, Dialogue: Silesia and its Dialect. 5.50, Market Prices. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, News. 7.10, Chamber Music, conducted by Ernst Prade. 7.40, Andreas Holmann Play (Hans Christoph Kaerzel), arranged for Radio. 9.20, Time and News. 9.45, Talk: Silesian Scenery—The Riesengebirge. 10.5, Dance Music and Light Music by the Michael Danmann Band, relayed from the Hans Oberschlesien, Gleiwitz. 11.0 (approx.), Close Down.

### BRNO

878 kc/s, 342 metres; 35 kW.—4.5 p.m., Quartet Concert: String Quartet in E Flat Op. 97 (Dvorak); String Quartet No. 3 in E Flat (Chabana). 5.5, See Prague. 5.15, Talk for Workers. 5.25, German Transmission: News, Sports Report and Book Review. 6.0, See Prague. 7.10, Pianoforte Recital by Pavel Weiss; Chromatic Jazz (Weiss); Offenbachide (Weiss); Waltz Paraphrase on Themes from Die Fledermaus (Strauss-Weiss). 7.30, See Prague. 9.30 (approx.), Close Down.

### BRUSSELS (No. 1)

1.N.R., 590 kc/s, 509 metres; 15 kW.—12.0 Noon, The Hunt Gramophone Concert. 1.0 p.m., Le Journal Parlé. 1.10, Extracts from Manon-Opera (Massenet) on Gramophone Records. 5.0, Wagner Concert by the Station Symphony Orchestra, conducted by Jean Kumps: Overture, Tamhäuser; Siegfried Idyll; Forest Murmurs from Siegfried; Overture, The Mastersingers. 6.0, Talk on Art. 6.15, Gramophone Music: Mattinata (Leoncavallo); Selection from Eldorado (Ruthland-Clapham); Kunstlerleben (Johann Strauss). 6.40, Recital of Etudes (Chopin) by Oscar Delvigne (Pianoforte). 7.15, Talk: Income Tax. 7.30, Legal Talk and Literary Review. 8.0, Concert by the Radio Orchestra, conducted by Franz

André. 8.45, Talk: A Cruise round the World. 9.0, Concert (cont'd.): Soloist: Mlle. Stany Pailloot (Songs): March (Sykes); Waltz (Rotter and Jurmann); Selection from Good News (de Sylva and Brown); Songs: (a) Aria from The Barber of Seville (Rossini); (b) Aria from Lakmé (Delibes); (c) La tombée du soir (Thibaut); Suite (Akinenko); Extracts from L'Arlesienne (Bizet); Wallon Airs (Waugermee); African Suite (Coleridge-Taylor); Norwegian Dances (Grieg). 10.0, Le Journal Parlé. 10.10, La Branbanoue.

### BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW. Programme in Flemish. 12 Noon, Gramophone Concert. 1.0 p.m., Le Journal Parlé. 1.10, Gramophone Concert. 5.0, Concert by the Radio Orchestra, conducted by Franz André: Overture, Le petit Faust (Hervé); Legend No. 10 (Dvorak); Bosphorus (Baeyens); Ballet Music from The Damnation of Faust (Berlioz); Dolce minuetto (Drlla); Largo (Handel); Potpourri, Souvenirs of Bayreuth (Morena). 5.45, Pallieter Programme. 6.30, Gramophone Concert: Overture, Les Saltimbanques (Ganne); Selection from Miss Decima (Audran); Aria from The Huguenots (Meyerbeer); Intermezzo from William Rateliff (Mascagni); Selection from Les Cloches de Corneville (Planquette); Aria from The Barber of Seville (Rossini); Farewell Scene from Lohengrin (Wagner); Selection from Mignon (Thomas). 7.15, Talk by Jan Timmermans: The Education of the Flemish People. 7.30, Radio Notes. 8.0, Gramophone Record. 8.10 (approx.), Concert by the Station Symphony Orchestra, conducted by Jean Kumps; Soloists, Mlle. Aerts (Soprano), De Ilen (Tenor), and Pieter Aerts (Pianoforte); Part I: Funeral March from The Third Symphony (Beethoven); Songs; Recitations: Songs; Death of Siegfried from The Dusk of the Gods (Wagner). 8.45, Announcements. 8.50, Variety Items. 9.5, Concert; Part II: Flemish Music: Cortège (Verhoeven); Dance No. 1 in D (Verhoeven); Prelude No. 1 in A Minor (Verhoeven); Dance No. 2 in G (Verhoeven); Announcements; Popular Flemish Songs for Soprano, Tenor and Bass: Rubensmarsch (Benoit); Carnaval from Princesse d'Auberger (Bloeks); Impressions de mai (Slep); De Vlaamsche Leenw (Miry-Menemans). 10.0, Le Journal Parlé.

### BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Dance Music by the Ghinda Jazz Band. In an interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Gramophone Music. 6.45, Talk. 7.0, Symphony Concert by the Philharmonic Orchestra, relayed from the Athenaeum; Soloist, Lipatti (Pianoforte); Pianoforte Concerto (Vivaldi); Pianoforte Concerto in A Minor (Grieg); Simfonia domestica (Richard Strauss). In an interval at 7.20, Talk. 8.45, Radio Journal.

### BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 840 metres from 6.25 p.m. till Close Down. 4.0 p.m., Concert of Chamber Music by the Lesoncz Schweizer Orchestra. 4.30, Shortland Lesson. 5.0, Concert by the Lajos Veres Cigány Band. 5.50, Reading. 6.30, Programme relayed from the Royal Hungarian Opera House. In the intervals, Announcements. After the Programme Concert by the Karl Rura Cigány Band, relayed from the Ketter Restaurant.

CASSEL.—See Frankfurt.

### COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m., Time Signal and Chimes from the Town Hall. 11.2, Concert by the Bendix String Ensemble, relayed from the Wivex Restaurant. 1.0 p.m., Interval. 2.0, Dance Music by Julian and his Band, with vocal refrains by Skat Nörveig. In the interval at 2.45 (approx.), Reading. 4.0, Reading for Children. 4.20, Exchange and Fish Market Prices. 4.45, Talk: Strange Creatures from the Depths of the Skager Rack. 5.15, German Lesson. 5.45, Weather. 5.54, Announcements. 6.0, News. 6.15, Time. 6.30, Talk: The House of Assembly. 7.0, Time. 7.2, Programme by Per Knutzon. 7.10, Mozart Sonata Recital by Leo Hansen and Folmer Jensen: Violin and Pianoforte Sonata No. 3 in E Flat; Violin and Pianoforte Sonata No. 6 in E Minor. 7.30, Kabale and Liebe—Play in Five Acts (Schiller). 9.35, News. 9.50, Dance Music by the Tuxon Band, relayed from the Palace Hotel. In the interval at 11.0, Time and Chimes from the Town Hall. 11.30 (approx.), Close Down.

CORK.—See Athlone.

### CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Miscellaneous Items and Hints for the Week-End. 6.25, See Warsaw. In the intervals at 6.40, Programme Announcements, and at 9.40, Sports Notes. 10.30 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

### FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 a.m. to 12 Noon, Programme in English by the I.B.C.: Happy Hour. Part I—Accordion Band. Signature Tune; Yip-I-addy-I-ay (Flynn); Accordion Solo: Marche joyeuse (Cuvelier); Spanish Sweetheart (Hargreaves); After the Ball (Harris); Javanette (Bozi); Flor de Cuba (Conyers); Accordion Solo: A Revoir (Cuvelier); C'est un petit nid (Eblinger). Part II—Dance Music. 'Twixt the Devil and the Deep Blue Sea; Sweetness; Julian; Isn't this a Night for Love; Moon over Dixie; With you here and me here; Put on your old Grey Bonnet; I lay me down to sleep; Signature Tune. 12 Noon, Programme in French. 4.30 to 6.0, Programme in English by the I.B.C. 4.30, The I.B.C. Nursery Corner. 5.0, Concert for Southampton and Winchester Listeners. Signature Tune, The Night by the Sea; The Birth of the Blues (Henderson); Fluttering Birds (Gennin); Since you went away (Johnson); Throw open wide your Windows (Carlson); Many Happy Returns (de Bear); How deep is the Ocean (Berlin); A Farewell (Coleman); Wine, Woman and Song (Strauss). 5.30, Mandoline Band Concert for Bourne-mouth and Weymouth Listeners: In Old Seville (Rosen); Capriccio Mazurka (Ariente); Napolitana (Hay); Loin du bal (Gillet); Mandoline (Thomé); Tesoro Mio (Beccucci); Czardas (Monti); La Czarina (Ganne); Signature Tune. 6.0, Programme in French. 10.0 till Close Down, Programme in English by the I.B.C. 10.0, Dance Music: Signature Tune, The Bells of Normandy; Egypt; Cornflowers and Poppies; My Lucky Day; My Wishing Song; Sundown in a little Green Hollow; Nobody's Sweetheart; Sing another Line; My Moonlight Madonna; Pink Elephants; It's Sunday down in Caroline; It's not a Secret any more; I live for Love; Lover's Lane; Whistling under the Moon; I've got to pass your House; Lover; Signature Tune. 11.0, Orchestral Concert: Nautical Moments (arr. Winter); Blue Cloud (Ewing); Pianoforte Solo: Selection from A Bedtime Story; Song: Down in the Valley (Harrington); Sing another Line (Carson); I'll show you off; Song: There's Magic in the Air (Eyton); Selection from Wild Violets (Stolz). 11.30, Club Concert for Lancaster Listeners. Part I—Light Music. Signature Tune, The Chum Song; Rosa Mia (Guzar); Polly (Zamenik); Any time, any day, any where (Washington); Pianoforte Solo: Selection from The Desert Song (Romberg); Song: That's my Home (Rene); All over Italy (Munroe); Song: Letting in the Sunshine (Gay); Beautiful (Shay). 12.5 a.m. (Saturday), News Bulletin in English. 12.10 (approx.), Concert (cont'd.). Part II—Bass Durr Dan (Trumbauer). Baby, when you ain't there (Ellington); Underneath the Harlem Moon (Gordon); Manhattan (Alouche); Nine little Miles from Ten, Ten, Tennessee (Sherman); Signature Tune. 12.30, Dance Music: What a Perfect Combination; Isn't it Heavenly; Mary Rose; Isn't this a Night for Love; Somebody stole my Gal; Flor de Cuba; I've found the right Girl; Ding, Dong, Ding. 1.0, Dance Music: Signature Tune, The Bells of Normandy; Aloha Oe; Happy as the Day is Long; I'll take an option on you; Don't blame me; A Girl like Nina; Oh Johanna; Meet me in the Gloaming; The Diety Glide; Sweet Dreams, Pretty Lady; Carry me back to Green, Green Pastures; Lou'siana Lullaby; Lazybones; Wedding of the Dragonflies; Drifting down the Shalimar; I'll show you off; Seven years with the wrong Woman; Let's call it a Day; Signature Tune. 2.0 a.m., I.B.C. Good-night Melody and Close Down.

FLENSBURG.—See Hamburg.

FLORENCE.—See Turin.

### FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel, and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, News and Weather. 12.35, See Langenberg. 1.30 (from Cassel), News. 1.40, Talk. 2.30, Weather. 2.40, Time and Economic Notes. 3.0, See Leipzig. 5.0 to 5.35, See Langenberg. 5.35, Talk: The Danger to the American Worker of Competition from Coloured Labour. 5.50, Weather and News. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Topical Talk. 7.10 to 9.0, See Stuttgart. 9.30, News. 9.45, Light Music. 10.0, Concert by the Station Orchestra, conducted by Hans Rosband. Gavotte Zirkus Ranz (Flieger); Intermezzo, Die kleine Kompagnie (Gangleberger); Idyll, Tirili (Gangleberger); Two Pieces from Wie einst im Mai (Kollo); Foxtrot Intermezzo, Polospiele (Petras); Husarenritt (Spindler); Two Pieces from Clo-elo (Lehar); Batavia Foxtrot from The Cousin from Nowhere (Künneke); Song and March from Frühlingstluft (Joh. Strauss-

Reiterer). 11.0, Talk: The Fatherland in Hölderlin's Writings. 11.45 (approx.), Close Down.

**FREDRIKSSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres; and Kiel, 1,292 kc/s, 232.2 metres.—6.0 p.m., Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, Beethoven Concert, relayed from the Kaiserhof, Altona. The Choirs conducted by Willi Hammer, and Soloists: Lisa Jungkünd and Robert Kleinecke (Songs) and Manfred Forschner (Pianoforte). Overture, Die Geschöpfe des Prometheus; Arias from Egmont: (a) Die Trommel gerührt, (b) Freudvoll und leidvoll, (c) Musik zu Klärchens Tod; Leonore's Aria from Fidelio; Choral Fantasia, Op. 80; Cantata, Der glorreiche Augenblick (arr. Lenhitzky). 8.30, Reading from the Works of Ludwig Finckh, with Introductory Talk. 9.0, Time and News. 9.20 (from Hanover), Concert of Old Hanoverian Music, by the Symphony Orchestra of Unemployed Musicians, conducted by Otto Ebel von Sosen; Polonaise (Küken); Concert Overture, Waldleben (Küken); Erinnerung an Marienbad (Spohr); Abendglocken; Three Pieces (Bülow): (a) Allegro risoluto, (b) Notturmo, (c) Kriegerisches Intermezzo; Festklänge (Sommer); Melody (Sommer); Scherzo, Sonnenkind und Weykennami (Clemus); Idylle and Dance (Meyer-Stolzenau); Celler Schützenmarsch (Mietzner).

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert of Popular Music. In the intervals at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office, with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.15, Programme for Children. 2.40, Talk for Women: Domestic Labour in the Argentine. 3.0, See Leipzig. 4.35, Talk: The Peasant—the Backbone of the Nation. 5.0, Gramophone Concert: Die Wache zieht auf (Kochmann); Walzerperlen (Edward); Frisch gesungen (Slicher); Soumernaacht am Sternberger See (Freundorfer); Causerie (Gillet); Mädel klein, Mädel fein (Lehár); Andalusian Melody (Marguina); Deutschland, blühe neu auf (Meyer-Heimund); Saarland, blühe neu auf (Meyer-Heimund); Saarland (Lux). In an interval at 5.15, Agricultural Prices. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, News. 7.40, Symphony Concert by the Königsberg Opera House Orchestra, conducted by Ottorino Respighi; Soloist, Enrico Mainardi ('Cello). 9.0, News. 9.20, Lecture, Recital, and New German Dances.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW. up to 5.40 p.m., and 20 kW. from 5.40 p.m.—11.40 a.m. to 3.40 p.m., Programme of the General Broadcasting Company. 11.40, Time Signal. 11.41, Concert of Light Music, with Gramophone Interludes. 1.55 p.m., Gramophone Music. 2.10, Talk for Gardeners. 2.40, Gramophone Music. 3.40 to 7.40, Programme of the Workers' Radio Society (A.V.R.O.). 3.40, Gramophone Music. 4.30, Programme for Children. 5.10, Concert by the V.A.R.A. Orchestra, conducted by Hugo de Groot; Overture, The Crown Diamonds (Auber); Waltz, Gold and Silver (Lehár); Diamanten und Perlen (Dostal); Die goldene Spieluhr (Armandola); Arabisches Gold (Rust); Selection from The Dollar Princess (Fall); Les millions d'Arlequin (Drigo); Das goldene Kreuz (Krome); Pluie de Diamants (Waldteufel). 6.20, Gramophone Music. 6.30, Concert (cont'd). Attilia (Fucik); Wiener Praterleben (Trauslauer); Potpourri, Dividenden (Morena). 6.50, Talk. 7.10, Concert (cont'd.): Overture, Ilunyadi Laszlo (Ferenetz); Glow Worm Idyll (Lincke); Die Mühle im Tale (Rhode); Idylle (Razigade); Radetzky March (Joh. Strauss). 7.40 to 10.40, Programme of the Liberal Protestant Radio Society (V.P.R.O.). 7.40, Talk. 8.10, Concert of Chamber Music by Mme. Feltkamp-Belinfante ('Cello). Mme. Paris-Koene (Pianoforte); and Feltkamp (Flute). Sonata in G for 'Cello and Pianoforte (Marcello); Sonata in G for Flute and Pianoforte (Telemann); Concerto No. 5 (Rameau). 8.40, Talk. 9.10, Concert (cont'd.): Suite for 'Cello, Flute and Pianoforte (Voormolen); Sancta da camera (Pierné). 9.40, Religious Report and News. 9.55, Recitations. 10.25, Gramophone Music. 10.40, Organ Recital by Johan Jong: Melody (Gray); Love's Garden of Roses (Haydn Wood); Whistle for me (Tane); Life in Japan (Higgs); Selection from The Love Parade (Schert-

zinger). 10.10, Gramophone Music. 11.40 (approx.), Close Down.

**HORBV.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW. until 3.40 p.m. Transmitted from Kootwijk on 50 kW. from 3.40 p.m.—11.40 a.m. till Close Down. Programme of the Catholic Radio Society (K.R.O.). 11.40, Police Notes. 11.55, Concert of Light Music. 1.40, Gramophone Music. 2.10, Song and Pianoforte Recital by Kijk in de Vegt and Jan Tin Epenhuizen. Songs: (a) Aria from The Creation (Haydn). (b) Aria from The Seasons (Haydn). (c) Aria from Elijah (Mendelssohn). (d) On Wings of Song (Mendelssohn). Gramophone Records; Pianoforte Sonata in A, Op. 101 (Beethoven); Gramophone Records; Songs; Pianoforte Solos: (a) Mazurka, Op. 63, No. 3 (Chopin). (b) Mazurka, Op. 59, No. 3 (Chopin). (c) Evocation (Albeniz). (d) Prelude in G Minor (Rachmaninoff). 3.25, Gramophone Music. 3.55, Opera Music on Gramophone Records. 4.40, Concert by the K.R.O. Orchestra, conducted by Johan Gerritsen. Overture, Peter Schmolli (Weber); Oboe Concerto (Haydn); Rondo (Mozart); Romanian Rhapsody No. 2 (Enesco); Selection from Mignon (Thomas). In the interval at 5.30, Gramophone Music, and at 5.55, Talk: The State of Europe. 6.40, Police Notes. 6.55, Talk. 7.15, Gramophone Music. 7.25, Astronomical Talk. 7.40, Gramophone Music. 7.55, Das Lied von der Glocke—for Soloists, Choir, and Organ (Bruch). The Harlem Catholic Oratorio Society, conducted by Cuypers and the Harlem Orchestra. Soloists: To van der Shyus (Soprano), Anni Woud (Contralto), Plooyer (Tenor), Bogtman (Baritone), and Koop (Organ). In the interval at 8.55, News and Gramophone Music. 9.55, The Proposal—Play (Tehekov). 10.40, News. 10.45, Concert of Light Music. 11.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, Exchange, Racing Results and News. 8.10, Esperanto Lesson. 8.30, Radio Concert. In an interval at 9.0, News and Weather.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—12.25 p.m., News and Weather. 12.35, Concert by the Station Orchestra, conducted by Kühn, and the Station Choir, conducted by Breuer: Festival Overture on two Thuringian Folk Songs (Lassen); Three Folk Songs: (a) Frisch gesungen (Slicher), (b) Der Schmied (Schumann), (c) Tanz (Zöllner); Die Schwarzwälder Spieluhr (Doppler); Selection from Der Bettelstudent (Müllöcker); Three Folk Songs: (a) Hoho, du stolzes Mädel (Dregert), (b) Spatz und Spätzlin, (c) Schneiders Höllenfahrt; Polka, Im Kahlenberger Dörf (Fahrbach); Waltz, Volks-sänger (Strauss). 1.30, Talk: The Reclaiming of Bog-land. 1.45, Chamber Music. Jakob Braun (Violin), Albert Steinmann ('Cello), Kurt Wessel (Harp), and Walter Wielich (Pianoforte). Romance for Harp and Pianoforte (Oberthür); Scream for Violin, 'Cello, and Harp (Oelschlägel); Violin, 'Cello, and Harp: Doubt (Glinka). 2.0, Talk: Excursions in the Rhineland and Westphalia. 2.30, Market Prices. 2.50, Political Announcements. 3.0, See Leipzig. 5.0, English Conversation. 5.20, Talk on Genealogical Research. 5.35, St. Hubert—Poem (Jakob Kneip). 5.50, Announcements. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, See Frankfurt. 7.10 to 9.0, See Stuttgart. 9.0, News and Weather. 9.45 to 11.45, See Frankfurt. 11.45 (approx.), Close Down.

**LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—12.30 p.m., Gramophone Concert. 1.15, News. 1.30, Art Review. 1.40, Songs and Pianoforte Recital by Ellen Weber (Soprano) and Otto Goldhammer: Selection from Aus meinem Tagebuch (Reger): (a) Vivace in A, No. 1, (b) Andante sostenuto in D, No. 3, (c) Vivace in D, No. 7; Songs (Trunk): (a) Die Stadt, (b) Mir träumte von einem Königs-kind; Selection from Aus meinem Tagebuch (Reger): (a) Andantino in A minor, No. 8, (b) Vivace in D, No. 9; German Folk Songs: (a) Rose im Schnee (Fischer), (b) Schlaflied (Wehnke), (c) Absage (Kruse). 2.15, Wireless Notes. 2.35, Market Prices. 3.0 (from Dresden), Concert by the Dresden Philharmonic Orchestra, conducted by Theodor Blumer: Overture, Figaro (Mozart); Selection from Der Kührreign (Kienzl); Waltz, Die Romantiker (Lanner); Pieces from Bilder

NOV. 3rd **FRIDAY** continued

aus dem Süden (Nicoedé); (a) Andalusienne, (b) Provençalisches Märchen, (c) In der Taberna; Selection from La Bohème (Puccini); Lyric Suite, Op. 54 (Grieg); Overture, Light Cavalry (Suppé). 4.30, Lyrics by Eduard Mörike. 4.40, Talk: German Folk Literature in Austria. 5.0, Book Review. 5.20, Folk Song Recital by Margarete Roll: Swedish Folk Song; Norwegian Song; The Shepherd's Call; Serbian Folk Song; Scottish Folk Song, Loch Lomond; German Folk Songs: (a) Du, drohen auf Jenem Berge, (b) All meine Gedanken, (c) Kommt ihr G'spielen, (d) Tanzen und Springen. 5.45, Market Prices and Review of the Day's Events. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.5, See Berlin (Funkstunde). 8.0, Concert of Hunting Music for St. Hubert's Day; The Station—Orchestra, conducted by Hilmar Weber; Soloist, Paul Holzner (French Horn); Overture, La classe du jeune Henri (Méhul); French Horn Concerto in E flat (Mozart); Minuet and Finale from the Symphony Auf dem Anstand (Haydn); Selection from Der Freischütz (Weber); Waltz, Herbstrosen (Jos. Strauss). 9.0, News and Sports Notes. 9.30, Talk: Prohibition and its Cultural Ideals. 10.0 (from Dresden), Concert of Contemporary Chamber Music; Charlotte Dauthe (Mezzo-Soprano), Gustav Fritzsche (Violin), Alex Kropholler ('Cello), and Theodor Blumer (Pianoforte): Variations and Rondo on the Folk Song, Ein Schneider wollte wandern (Lohse); Four Songs on Swabian Themes (Lafite), with 'Cello and Pianoforte Accompaniment; Song from the Marienlieder (Lafite); Trio in D minor (Komauer). 11.0 (approx.), Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—5.0 p.m., Gramophone Music. 5.30, Talk. 6.0, Talk for Sokols. 6.30, Hints for the Week-end. 7.0, Programme relayed from Zagreb, 977 kc/s, 307 metres. 9.0, Weather, Gramophone Records and Dance Music. 10.0 (approx.), Close Down.

**LUXEMBOURG**

352 kc/s, 1,191 metres; 200 kW.—Dutch Evening. 7.0 p.m., Sonata in D Minor, Op. 38 (Brahms) for 'Cello and Pianoforte, on Gramophone Records. 7.30, Recital of Songs from Operettas by Edouard Lichtenstein. 8.0, Concert of Dances by the Station Orchestra, conducted by Pensis: German Dance (Schubert); Hungarian Dance No. 5 (Brahms); Slav Dance No. 1 (Dvorak); Spanish Dance No. 5 (Moszkowsky); Spanish Dance No. 5 (Granados); Norwegian Dance No. 4 (Grieg); Polovtsian Dances (Borodin). 8.50, News. 9.0, Music by the Station Orchestra: Suite, L'Arlesienne (Bizet); Overture, The Thieving Magpie (Rossini). 9.30, Gramophone Records: Sinfonia (J. C. Bach); La Naisance de la Lyre (Roussel). 9.45, News in German. 9.55, Cabaret Music on Gramophone Records. 10.20, Dance Music.

**MADRID**

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—10.30 p.m., Light Music. 10.45 Radio Chronicle. 11.0, Popular Concert. 11.45, Light Music. 12 Midnight to 12.30 a.m. (Saturday), Programme in English by the I.B.C. Concert: The Love Lieutenant; The Siege of Monte Carlo; The Skaters; There's a Flower in my Ranch; Beautiful Spring; Now I'm in Love; Marta; Star Song. 12.30, I.B.C. Goodnight Melody and Close Down.

**MADRID**

(EAJ7), 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Radio Journal and Request Gramophone Records. 8.15, Topical Review. 8.30 to 9.30, Interval. 9.30, Chimes, Time and Topical Review. 9.45 (approx.), The Barber of Seville—Opera (Rossini) on Gramophone Records. 11.45, Topical Review and Programme Announcements for Listeners Abroad. 12 Midnight, Chimes and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Concert by the Station Orchestra, conducted by Flichta: Overture No. 1 in E for Small Orchestra (Blodek); Rhapsody in D, Op. 45, No. 1 (Dvorak); Florentine Serenade (Godard); Lyric Pieces, Op. 51 (Grieg); Waltz from the Serenade, Op. 45 (Tchelikovsky); March, Atalla (Provažnik). 3.55, Talk: Modern Silesian Authors. 4.5, See Brno. 6.5, Tourist Report. 5.15, See Prague. 9.30 (approx.), Close Down.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres; and Nürnberg, 1,256 kc/s, 239

metres.—3.30 p.m., Orchestral Concert: Overture, Mignon (Thomas); Ständchen (Richard Strauss); Selection from Il Trovatore (Verdi); Melody, Serenade and Entr'acte (Gounod); Schubert Dance Potpourri (Bohne); Two Pieces (Jensen); Gavotte, Aus verklungenen Tagen (Manfred); Melody (Gillet). 4.45, Reading: The Laws of Sparta (Schillen). 5.5, The Youth of Richard Strauss—a Biographical Portrait by Carl Orff. 5.25, Talk: Franz von Bader, a Bavarian Philosopher. 5.45, Time, Weather, and Agricultural Report. 6.0, Transmission for all German Stations, relayed from Berlin (Funkstunde). 7.0, A Radio Picture (Richard Billinger). 8.0, Symphony Concert by the Station Orchestra, conducted by Hans Winter. Soloists: Margarete Burkardt Rohr (Soprano), Willy Schulfauth (Violin), Giacinta della Rocca (Viola), and Richard Staab (Pianoforte). Prelude, Intermezzo and Aria for Soprano, Op. 84 (Graener); Concerto for Violin, Viola, Pianoforte and Orchestra (Höller). In the interval, Political Talk. 9.0, Time and News.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredriksstad, 815 kc/s, 368.1 metres; Hamar, 422 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres; and Rjukan, 671 kc/s, 447.1 metres.—4.0 p.m., Concert by the Station Orchestra, conducted by Kramm: Overture, Die Felsenmühle (Reissiger); Schubert Potpourri (Urbaeh); Meditation (Bach-Gounod); Andante (Saint-Saëns); Melody (Signe Lund); Selection from Der Evangelimann (Kienzl). 5.0, Recitations. 5.30, Song and Harp Recital by Fanny Elsta and Oscar Harlem: Songs: (a) Litanci (Schubert), (b) Two Songs (Alnaes), (c) Du fatter ei bølgenes evige sang (Grieg), (d) Le Cygne (Saint-Saëns); Harp Solo, The Moldau (Smetana); Stille mit herte (Hannikainen); Songs: (a) Black Roses (Sibelius), (b) Mysterium (Merikanto), (c) Gretchen am Spinnrad and Ave Maria (Schubert). 6.15, Weather and News. 6.30, Talk. 7.0, Time Signal. 7.1, Symphony Concert by the Philharmonic Orchestra, conducted by Kiehlund. 8.40, Weather and News. 9.0, Topical Talk. 9.15, Light Music. 9.45 (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m. Dopolavoro Notes, Tourist Talk, Agricultural Report, Report of the Royal Geographical Society and Giornale Radio. 7.20, Gramophone Music. In an interval at 7.30, Time and Announcements. 7.45, Concert of Opera Music, conducted by Russo. In an interval, Talk: The Fourth of November, 1918. 10.0, Giornale Radio.

**PARIS**

EIFFEL TOWER, Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and 6-dot Signals).—5.45 p.m., Le Journal Parlé. 7.30, Pianoforte Recital by Marie-Antoinette Pradier, with Commentary by André Delacour: Kinderszenen (Schumann); Humoresque. 8.0, News. 8.15, Orchestral Concert conducted by Flamant: Selection from Manon Lescaut (Puccini); Violin Solo; Monsieur de Pourcagnac (Lully-Vidal); 'Cello Solo; Six Ukrainian Pieces; Pastel (Paradis); Rag-time (Satie). 9.0 (approx.), Close Down.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Prelude to Le Déluge (Saint-Saëns) on Gramophone Records. 7.5, Talk. 7.15, Le Journal Parlé. 7.30, Pianoforte Recital: Tie, Toc, Choc (Couperin); Le Coucou (Daquin); Les Muletiers devant le Christ de Liviin (de Sévère); Filenses près de Carante (Rhené-Baton); Jeux de beauté (Fraggi); Cake-Walk (Debussy); Cachecache (Pierné). 7.55, Review of the Week. 8.0, Talk on Music. 8.10, Interval. 8.30, Le Nouveau Seigneur du village—Opéra-Comique in One Act (Boieldieu), followed by Le Testament de M. de Crac—Opéra-Bouffe in One Act (Lecocq). 10.30, News.

**PARIS**

RADIO PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, News. 7.45, Gramophone Music. 8.0, News. 12 Noon, Jewish Talk. 12.30 p.m., Gramophone Concert of French Music: Scènes pittoresques (Massenet); Song from Grisélidis (Massenet); Meditation from Thais (Massenet); Duet from Manon (Massenet); Interlude and Aria from Louise (Charpentier); Le Nil (Leroux); Overture, Ramuntcho (Pierné); Concert Polonaise (Vidal); Two Arias from Monna Vanna (Février); Prelude de la Habuera (Laparra); Arabesque No. 1 (Debussy); Eglogue (Rabaud); Paysage (Hahn); Viennese Rhapsody (Schmitt). In the intervals at 1.0, Exchange and News, and at 1.30, Exchange. 2.0, Exchange. 3.45, Exchange and Market Prices. 4.30, English Lesson. 6.20, Agricultural Talk. 6.45, Talk: Social Assurance. 7.0, Talk: The Modern Novel. 7.20, Gramophone Music: Coeur Joyeux (Meisler); Parle-moi d'autre chose (Delettre); Extase

NOV. 3rd **FRIDAY** continued

(Game); Aubade printanière (Lacombe); Blonde amie (Carel); The Forge in the Forest (Eilenberg); In the Shadows (Fieck); Waltz, Gold and Silver (Lehar). 7.45, Commercial Prices and News. 8.0, Literary Talk: The Modern Novel, 8.30, News, 8.40, Gastronomie Review, 8.45, Radio Play, 9.15, News. 9.30, Rose ma voisine—Opéra-Comique (Chadab). 10.0, Gramophone Concert: Two Guitars; De tout mon coeur (Claret); Bretonne Dance, Gavotte de Bailleux; Nuit sur mer (Valente aull Genise); Quand les chats sont partis (Raiter); Two Songs (Stolz).

**PITTSBURGH**

KDKA, 980 kc/s, 306 metres; 50 kW. Relayed by W8XK on 48.86 metres and 25.27 metres.—7.0 p.m., Musical Originalities, from New York. 7.30, KDKA Home Forum, 8.0, Programme to be announced. 8.15 to 9.30, New York Relay, 8.15, Utility Hall, 8.30, Words and Music, 8.45, Morin Sisters, 9.0, Betty and Bob, 9.15, Gene Quaw's Orchestra, 9.30, News and Markets, 9.45, Arcadians, from New York, 10.0, Uncle Tom and Betty, from New York, 10.15, KDKA Kiddies' Klub, 10.30, Singing Lady, from New York, 10.45, Orphan Annie, from New York, 11.0, Press News-Reader, 11.15, Sports, Pat Italy, 11.30, Pittsburgh Spotlights, 11.45, Lowell Thomas, from New York, 12 Midnight, Amos 'n' Andy, from New York, 12.15 a.m. (Saturday), Silver Toppers, 12.30 to 3.30, New York Relay, 12.30, Circus Days, 12.45, Irene Rich for Welch, 1.0, Popular Programme, 1.30, Potash and Perlmutter, 1.45, Red Davis, 2.0, Let's listen to Harris, 2.30, Variety Programme, 3.0, C.S. Army Band.

PORSGRUND.—See Oslo.

**PRAGUE**

614 kc/s, 488.6 metres; 12 kW.—3.0 p.m., See Moravská-Ostrava, 3.55, Talk: Book-binding, 4.5, See Brno, 5.5, Market Prices, 5.15, Talk for Workers, 5.25, News in German, 5.30, German Transmission: Talk, The Chemical Industry in Czechoslovakia, 6.0, Time and News, 6.10, English Lesson, 6.25, Concert by the Station Orchestra, conducted by Jeremias; Soloist: Josef Schwarz (Bass-Baritone); Overture, The Tinker (Skroup); Aria from The Secret (Smetana); Entr'acte from The Devil and Kate (Dvorák); Aria from Libusse (Smetana); Melody from The Polish Jew (Weiss); Aria from The Devil's Lock (Smetana); Ballet Music from Hedy (Fibich), 7.10, Jiri Vohlan Song Recital by the Composer, 7.30, A Napoleonic Trilogy—Radio Poem (Kysar), 9.0, Time and News, 9.15, Russian News, 9.30 (approx.), Close Down.

**RADIO-SUISSE ROMANDE**

SOTTENS, 743 kc/s, 403 metres; 25 kW.; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics, 11.28, Time Signal from Neuchâtel Observatory, 11.30, News and Weather, 11.40 (from Geneva), Gramophone Music: Overture, Semiramis (Rossini); Light Orchestral Pieces, 12.0 Noon (from Geneva), Financial News, 12.10 p.m. (from Geneva), Gramophone Concert: Two Songs; Jewel Song and Aria from Faust (Gounod); Air from The Pearl Fishers (Bizet); Intermezzo from L'Arlesienne (Bizet); Quartet in G minor (Debussy), 1.0 to 2.58, Interval, 2.58, Time Signal from Neuchâtel Observatory, 3.0 (from Zürich), Concert, 5.0 (from Geneva), Programme for Women, 5.30 (from Geneva), Esperanto Lesson, 5.40 (from Geneva), English Lesson, 6.5 (from Geneva), Bridge Lesson, 6.20 (from Geneva), Chess Lesson, 6.35, Gramophone Records and Talk, 6.59, Weather, 7.0 (from Geneva), Talk: Art in China ware, 7.20 (from Geneva), Chamber Music: Quartet (Mozart); Trio (Ravel), 8.0 (from Geneva), Cabaret Programme, 9.0, News and Weather, 9.10 (from Geneva), Talk: The Work of the League of Nations, 9.30 (approx.), Close Down.

**REYKJAVIK**

250 kc/s, 1,200 metres; 21 kW.—11.0 a.m., Weather Forecast, 1.15 p.m., Variety Programme, 4.0, Weather Forecast, 8.10, Weather Forecast, 8.20, Light Music and Announcements, 9.0, Light Music, 9.30, Talk, 10.0, Time and News, 10.30, Quartet in D Minor (Schubert) on Gramophone Records.

RJUKAN.—See Oslo.

**ROME**

Call 1R0, 680 kc/s, 441 metres; 50 kW. Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.15 p.m. (approx.), and 2R0, 11,810 kc/s, 25.4 metres from 4.15 p.m.—12 Noon to 1.15 p.m., Orchestral Concert, in the intervals at 12.30, Giornale Radio and Exchange, and at 1.0, Time and Announcements, 3.30, Children's Radio Review, 3.55, Giornale Radio and Exchange, 4.10, Weather, 4.15 to 5.0, Concert by the Rome Quartet, with songs by Mario Cavagnis (Tenor) and Carmen Garcia Cornejo (South American Songs); Adagio and Allegro from the Quartet in C (Mozart); Scherzo from the Quartet in D Minor (Schubert); Tenor Solos: (a) La Procession

(Franck), (b) Tutto è finito from Il Re (Giordano), (c) Aria from Manon (Massenet); Adagio and Finale from the Quartet in G (Perosi); South American Songs, 5.40 (Naples), Shipping and Sports Notes, 5.45, Dolopavaro Announcements and Tourist Report, 5.57, Report of the International Institute of Agriculture (in Spanish, German and French), 6.10, Agricultural Notes and Wheat Market Report, 6.20, News in Foreign Languages, 6.40, Giornale Radio, 7.0, Time, Announcements, and Sports Notes, 7.15, Sponsored Concert, 8.15, A Comedy in Three Acts, 9.30 (approx.), Dance Music, 10.0, Giornale Radio.

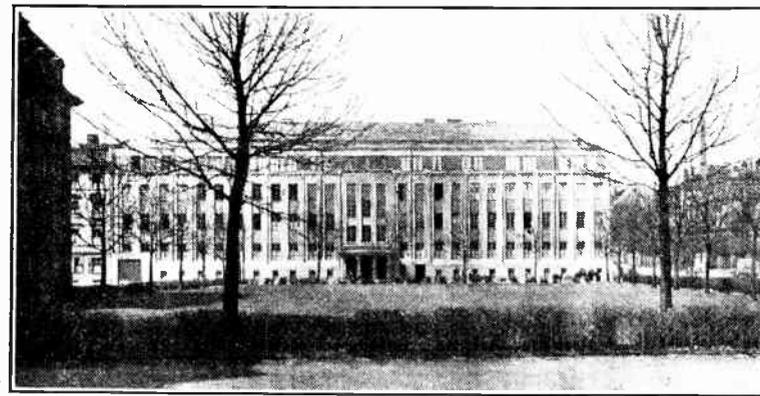
SALZBURG.—See Vienna.

**SCHENECTADY**

(WGY), 790 kc/s, 379.5 metres; 50 kW. Relayed at intervals by W2XAF on 31.48 metres, and by W2XAD on 19.56 metres.—7.30 to 8.30 p.m. (approx.), New York Relay, 7.30, Echoes of Erin, 7.45, Sonata Recital, 8.0, Three Shades of Blue, Male Trio, 8.15, Soloist, 12.45 a.m. (Saturday), Stock Reports, 1.0 to 3.30, New York Relay, 1.0, Cities Service Concert, 2.0, Fred Allen; Ferde Grofé's Orchestra, 2.30, Orchestral Concert, 3.0, First Nighters, Sketch, 3.30, Lun and Abner's Friday Night Sociable, from New York.

**SCHWEIZERISCHER LANDESENDER**

BEROMUNSTER, 653 kc/s, 459 metres; 20 kW.; Basle, 1,229 kc/s, 244.1 metres; and



MUNICH. A view of Munich's "Broadcasting House," which is one of the largest buildings of its kind in Germany.

Berne, 1,220 kc/s, 245.9 metres, 5.50 to 6.5 a.m. (from Berne), Gymnastics, 9.20 (from Zürich), Broadcast for Schools, 9.50 to 11.0, Interval, 11.0 (from Basle), Italian Folk Music on Gramophone Records, 11.29, Time Signal from Neuchâtel Observatory, Weather and News, 11.40 (from Basle), Light Music on Gramophone Records, 12.25 p.m. (from Basle), Time, Weather and Exchange, 12.30 (approx.) to 2.30, Interval, 2.30 (from Zürich), Gramophone Music, 3.0 (from Zürich), Concert by the Radio Orchestra, 4.0, Gramophone Music, 4.10 (from Zürich), Light Orchestral Concert, 5.0 (from Zürich), Programme for Children, 5.30 (from Berne), Talk: Poison and Crime, 6.0 (from Berne), Time, Weather, Market Prices, Tourist Report and Sports Notes, 6.20 (from Berne), Swiss Week—Talk on the Significance of the Cantons Coats of Arms, 6.50, Concert by the Radio Orchestra, 7.20 (from Berne), Newspaper Extracts of Thirty Years Ago, 7.30 (from Berne), Love and Death Song Recital, 8.0, Weather and News, 8.10 (from Berne), Concert, 9.15 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

**STOCKHOLM**

689 kc/s, 436 metres; 55 kW. Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—12.0 Noon to 12.30 p.m., Broadcast for Schools; Part I: First Movement from the String Quartet in A Minor, Op. 29 (Schubert); Part II: Reading, relayed from Malmö, 1.301 kc/s, 231 metres, 4.5 p.m., Talk: The Swedish Scout Movement, 4.25, Provincial Programme, 5.0, Gramophone Music, 5.55, Talk on Foreign Politics, 6.15, Weather and News, 6.30, Talk, relayed from Malmö; The Swedes; Piatigorsky, relayed from the Concert Hall; Sonata (Caporale); Suite in D (Bach); Concerto in B Flat (Bochstein), 8.0, Veni vni? (Who Knows?), Comedy in One Act (Heldt-Krog), 8.45, Weather and News, 9.0 (from

Göteborg), Light Orchestral Concert: Overture, Casanova (Lincke); Roses from the South (Joh. Strauss); Serenade (Widcon); Piece (Peterson-Berger); Melodies (arr. Sköld); Violin Solo; Piece (Gardner); Minuet (Bolzoni); Von Wien durch die Welt (Himby), 10.0 (approx.), Close Down.

**STRASBOURG**

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Concert: Two Movements from the Quartet in F (Beethoven); Allegro (Beethoven); Transformation and Two Scenes and Good Friday Magic from Parsifal (Wagner), 12.45 p.m., News, 1.0, Time and Exchange, 1.5, Gramophone Music: Hungarian Rhapsody No. 2 (Liszt); Wohin (Schubert); Minuet (Schubert); Waltz in A (Brahms); Slav Dance (Dvorák); Three Arias from Werther (Massenet); Your little hand, from La Bohème (Puccini); Overture, The Secret Marriage (Cimarosa); March (Martineau), 2.0, Interval, 4.45, Talk: Madame Récamier, 5.0, Orchestral Concert, conducted by Roskam; Suite, Ballet espagnole (Mirandola); Cello Solo; Overture, Morning, Noon and Night (Suppé); Intermezzo, A little Flirtation (Lautenschläger); Selection from I Pagliacci (Leoncavallo); Waltz, A toi (Waldteufel); Chines March (Lincke), 6.0, Trio Concert, relayed from Lille, 1,130 kc/s, 265.4 metres, 7.0, Topical Talk in German, 7.15, Talk: La Fontaine, 7.30, Time and News, 7.45, Gramophone Music, 8.0, Press Review in German, Lottery Results and Announcements, 8.30, Concert by the Calvet Quartet, relayed from Metz; Quartet in G (Mozart); Quartet, Op. 74,

No. 10 (Beethoven); Quartet (Ravel), 10.0 (approx.), Press Review.

**STUTTGART**

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW. Relayed by Freiburg, 527 kc/s, 570 metres.—12.25 p.m., News and Programme Announcements, 12.35, See Langenberg, 1.30, Talk: A Sunday Excursion into the Swabian Forests, 1.45, Swabian Anecdotes, 2.30, Recital for Flute, Oboe and Harpsichord, 3.0, See Leipzig, 5.0 to 5.35, See Langenberg, 5.35, Legal Talk, 5.50, Time, Agricultural Notes and Weather, 6.0, Transmission for all German Stations relayed from Berlin (Funkstunde), 7.0, See Frankfurt, 7.10, A Radio Sequence of Prose and Music, 8.30, Symphony in D (Haydn) by the Station Orchestra, conducted by Ferdinand Prost, 9.0, See Frankfurt, 9.20, Topical Talk, 9.30, Local News, 9.45 to 11.45, See Frankfurt, 11.45 (approx.), Close Down.

SUNDSVALL.—See Stockholm.

**TOULOUSE**

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News, 6.15, Music from Sound-Films, 6.30, Operetta Music, 6.45, Chansonneter, 7.0, Medical Talk, 7.15, News, 7.30, Spanish Songs, 7.45, The Three-Cornered Hat (Fallas) Concert Version by the Symphony Orchestra, 8.0, Operetta Music, 8.15, Military Music, 8.30, Orchestral Concert, 9.0, Opera and Opera-Comique Music: Scene in a Church from Faust (Gounod); Aria from Don Giovanni (Mozart); Serenade from I Pagliacci (Leoncavallo); Aria from Trist (Massenet); Aria from Mireille (Gounod); O Lala, white as the flowers of the briar, from Cavalleria rusticana (Mascagni); Prayer to Durga, from Lakmé (Delibes); Aria from Rigoleto (Verdi); Aria from Don Quixote (Massenet), 9.45, The Station Symphony Orchestra: Wedding Waltz (Lincke); Marche musicale (Schubert); Hungarian Rhapsody No. 2 (Liszt), 10.0, Light Music, 10.15, North African News, 10.30, Concert for Listeners in Morocco, 11.0, Light Music,

11.15, Dance Music, 12 Midnight, News, 12.5 a.m. (Saturday), Balalaika Music and Russian Songs, 12.15, Light Orchestral Music, 12.50 (approx.), Close Down.

**TRIESTE**

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m., Concert by a Mandoline Society: Soloist: Tullio Mazzetto (Baritone) and Thea Mendietta (Soprano); Serenata lombarda (Allieri); The Village Blacksmith (Heins); Baritone Solo: (a) Non è ver (Mattei), (b) Non t'amo più (Tosti); Soprano Solos: (a) Bergerette (Reeli), (b) Lilla (Kakmaninov); Waltz, Tramonto (Sartori); Soprano Solo: (a) Stornello (Cimara), (b) In sandalo (Bianchini), 5.0 till Close Down, See Turin.

TRONDHEIM.—See Oslo.

**TURIN**

1,096 kc/s, 273.7 metres; 7 kW. Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 759 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 to 5.0 p.m., Chamber Music, 5.0 to 5.5, Weather, 5.40, Giornale Radio, Popolavoro Notes and Gramophone Music, 6.0, Time, Report of the Royal Geographical Society and Gramophone Music, 6.10, Agricultural Report, 6.20, News in Foreign Languages, 6.40, Gramophone Music, 7.0, News, 7.15, Sponsored Music, 7.30, An Operetta in Three Acts, 10.0, Giornale Radio.

**VATICAN CITY**

15,120 kc/s, 19.84 metres (Morning) and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15 a.m., Religious Information in German, 7.0 to 7.15 p.m., Religious Information in Italian.

**VIENNA**

581 kc/s, 517 metres; 100 kW. Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m., Orchestral Concert, conducted by Holzer, 12 Noon, Time and News, 12.10 p.m., Famous Artists on Gramophone Records, 1.0, Interval, 2.0, Time and Announcements, 2.20, Talk: The Preservation of Foods, 2.35, Programme for Children, 3.0, Volkman Piano-forte Duets, in Memory of the Fiftieth Anniversary of the Composer's Death: Rondino; March in F minor; Der Schäfer; Die Russen kommen; Three Hungarian Sketches; Ritterstück Ernster Gang; Unter der Linde, 3.25, Music from Sound Films (on Gramophone Records), 4.15, Song and Piano-forte Recital by Luise Bräblich (Soprano) and Hertha Offner; Songs (Brahms): (a) Mainacht, (b) Sapphische Ode; Songs (Wagner): (a) Träume, (b) Schmerzen; Songs (Mars): (a) September Morgen, (b) Der Ton Song; Altesseelen (R. Strauss); Piano-forte Sonata in C (Weber), 4.55, Tourist Notes, 5.10, Talk seasonal Trades, 5.25, Sports Report, 5.35, Talk: The History of the Austrian Provinces, 6.0, Concert of Ballet Music by the Wiener Symphoniker, conducted by Holzer; Prelude to Aschenbrödel (Strauss); Cracoviak from Lazy John (Nedbal); Waltz and March from Rind im Wien (Bayer); Spanish Waltz, The Pearl of Iberia (Hellmesberger); Selection from Die Puppenfee (Bayer); Czardas from Coppélia (Delibes); Gallop from Gonne and Erlé (Bayer), 6.50, Reading, 7.15, Time and Announcements, 7.25, Gutenberg Programme, Part I: The Secret Valley—Dialogue, Part II: In Gutenberg—Sketch in One Act (Karlweis), 9.0, News and Weather, 9.15, Dance Music by Claire Hegeudis and her Orchestra, from the Café Palmhof, After the Programme, Exchange.

**WARSAW**

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Chimes from St. Mary's Church, Cracow, 11.5, Dance Music, 11.30, Radio Journal, 11.35, Weather, 11.38, Dance Music (cont'd.), 12 Noon, Interval, 2.30 p.m., Talk on Economics, 2.40, News, 2.45, Talk for Boy Scouts, 2.50, Maritime and Colonial Notes, 2.55, Song Recital by Mme. Zeliska: Lisa's Aria from The Queen of Spades (Tchaikovsky); Aria from Manon (Massenet); Waltz from Casanova (Rozycski); Bereuzs (Gretchaninov); Song (Friedman), 3.20, Gramophone Music, 3.40, Book Review, 3.55, Violin Recital by Lewenstein; Sonata in E Minor (Bach); Largo (Veracini); Variations (Tartini-Kreisler); Melody (Gluck-Kreisler); Minuet (Mozart); Romance (Selmann-Kreisler); Rondo (Schubert-Friedberg), 4.30, Song Recital by Mossakowsky, 4.50, Talk, 5.0, Talk: Modern Poland, 5.20, Concert of Light Music from the Café Adria, 6.5, Miscellaneous Announcements, 6.20, Talk: What to do on Holidays, 6.25, Topical Talk, 6.40, Programme Announcements, 6.45, Radio Journal, 7.0, Talk on Music, 7.15, Concert by the Philharmonic Orchestra, conducted by Massimo Freccia, Soloist: Zino Francescatti (Violin), Passacaglia in C Minor (Bach-Respighi); Violin Concerto in D (Brahms); Pictures from an Exhibition (Mussorgsky-Ravel); Overture, Tammbüser (Wagner); Violin Solos, in the interval at 8.0, Literary Reading, 9.40, Sports Notes, 9.50, Dance Music from the Femina Cabaret, 10.0, News, 10.5, Dance Music (cont'd.), ZÜRICH.—See Schweizerischer Landessender.

## ALGIERS

824 kc/s, 364 metres; 13 kW.—7.0 p.m., Financial Notes. 7.10, Shipping Notes. 7.15, Agricultural Notes and Weather. 7.20, Music from Opera. Arias from Don Giovanni (Mozart), Figaro (Mozart), Le Roi d'Ys (Lalo), Mirella (Gounod), and Thaïs (Massenet). 7.55, News. 8.0, Time. 8.2, Concert by the Station Orchestra. Selection from The Nuremberg Doll (Adam); Wedding Waltz (Lincke); Selection from François les bleus (Messager). 8.30, News. 8.35, Duet and Aria from Manon (Massenet). 8.45, "Concert (contd.). Petite Suite (Borodin); Pavane (Bruneau); Selection from Le Tribut de Zamora (Gounod); Wedding March (Mendelssohn). 9.30, News. 9.35, Dance Music with Vocal Refrains. 9.55, News.

## ATHLONE

725 kc/s, 413 metres; 60 kW. Relayed by Cork, 1,337 kc/s, 224.4 metres.—1.30 to 2.30 p.m., Time Signal, Weather Report, Stock Exchange Quotations and Gramophone Concert. 6.0, Gramophone Concert. 6.45, News. 7.0, Poetry Recital by Jill Noone. 7.15, Gaelic Talk. 7.30, Time Signal. 7.31, Liszt Music by the Station Orchestra. 8.0, Extracts from The Good-Natured Man, by M. O'Hea and Company. 8.30, The Station Orchestra. 8.45, Contralto Solos by Joan Burke. 9.0, Violin Solos by Noreen O'Connor. 9.15, The Station Orchestra. 9.30 to 10.30, Programme in English by the I.B.C. 9.30, Orchestral Concert: The Wedding of the Rose (Jessel); Trouble in Paradise (Wever); Song: You are my Heart's Delight (Lehár); Spanish Gipsy Dance (Marquina); Dancing Doll (Poldini); Song: Under Heaven's Blue (Pola); Sophisticated Lady (Ellington); Spanish March. Augero (Franco); Wireless World Announcement. 10.0, Concert arranged by the International Broadcasting Company (Ireland), Ltd.: Little Sunshine (Kraus); That's all that matters (Stept); Shuffle off to Buffalo (Dubin); Balloons (Shawn); Deep Water (Schwart); Sunny Madeira (Gilbert) We're all alone (Sievier). 10.30, Time Signal, News and Weather Report. 10.40, Traditional Fiddle Solos by L. O'Hogain. 10.50, Uilleann Pipe Solos by Liam Andrews. 11.0 (approx.), Close Down.

## BARCELONA

EAJ1, 860 kc/s, 348.8 metres; 8 kW.—5.30 p.m., Programme for Children. 7.0, Request Gramophone Music. 7.30, Exchange and Gramophone Music (contd.). 8.0, Gramophone Music. 8.15, Anti-War Talk, Gramophone Music and News. 9.0, Chimes from the Cathedral, Weather, Exchange and Market Prices. 9.5, Educational Talk. 9.35, Band Music. 10.20, Song Recital by Joan Barrabés. 10.40, Mendelssohn Concert by the Radio Orchestra: Hunting Song; Andante from the Violin Concerto; Spring Song; Nocturne from A Midsummer Night's Dream; Venetian Barcarolle; Overture, Fingal's Cave. In the interval at 11.0, News. After the Concert: Gramophone Music. 12 Mid-night (approx.), Close Down.

## BARI

1,112 kc/s, 269.8 metres; 20 kW.—3.30 p.m., Programme for Children. 3.55 to 5.0, See Rome. 5.35, News in Albanian. 5.45 till Close Down, See Rome.

BASLE.—See Schweizerischer Landessender.

## BELGRADE

697 kc/s, 430.4 metres; 2.8 kW.—3.0 p.m., Gramophone Music. 4.0, Recital of Songs. 5.55, Time Signal and Programme Announcements. 6.0, Talk. 6.30, Concert by the Station Orchestra. 7.0, Recital of Yugoslav Songs. 7.30, See Budapest. 9.10, Time and News, followed by Dance Music from the Auto Club.

## BERLIN

DEUTSCHLANDSENDER (Reichssender), 183.5 kc/s, 1,635 metres; 60 kW.—12.45 p.m., News. 1.0, Gramophone Concert: Tanz im Mondschein (Plessow); Du kommst für mich in Frage (Robin-Rainger); Schranmeln, spield's ma no' a Tanz; A gesunder Rausch tuat's a (Wolf-Löwe); In the Temple of the Belles (Yoshitomo); by the Waters of Minnetonka (Thurlow); Flinker Finger (Confrey); Melody (Cowler); Hauptpostlagernd; Ja, grün ist die Heide (Blume); Es rauscht das Meer ein Liebeslied (Kauler); Beinah (Reuter); Fensterpromenade (Mohr); Jetzt trink ma noch a Flascherl Wein; Sternschnuppen (Kauler). 2.0, Songs for Young People. 2.30, Weather and Exchange. 2.45, Reading (Hürper). 3.0, See Hamburg. 4.0, Weekly Sports Review. 4.20, A Musical Cabaret. 5.0, A Poem. 5.5, Topical Programme. 5.20, Ennui cooks for the First Time—Humorous Sketches (Lisa Peck). 5.45, Weather and Announcements. 6.0, Transmission for all German Stations, relayed from Langenberg. 7.0, To-day's Motto. 7.5, The Popular Song. Programme by Erwin Albrecht. 7.30, European Concert, relayed from Budapest. 9.15, News. 9.30, Radio Report of the German Sporting Press—Evening from the Sport Palace. 9.45, Weather. 10.0, Cigány Music, relayed from Budapest. 11.0 (approx.), Close Down.

## BERLIN

FUNKSTUNDE, 716 kc/s, 419 metres; 1.5 kW.—3.0 p.m., Accordion and Saxophone Music. In an interval at 4.0 (approx.), Talk on the Germany v. Norway Football

Match at Magdeburg. 4.30, Sound News Service. 4.55, Reger Song Recital by Lula Mys-Gmeiner: Three Songs, Op. 88; Four Schlichte Weisen, Op. 76. 5.15, Sports Talk. 5.30, The Funkstunde informs its Listeners. . . . 5.45, Topical Talk. 6.0, Transmission for all German Stations, relayed from Langenberg. 7.5, Strauss Concert by the Station Orchestra, conducted by Bernhard Homola, the Station Choir conducted by Heinz Karl Weigel, and the Berlin Pianoforte Trio: Three Pieces (Joh. Strauss): (a) Waltz, Sorgenbrecher, (b) Polka, Eisele, heisele Sprünge, (c) Waltz, Lorelei-Rheinklänge; Two Pieces (F. Strauss): (a) Polka Mazurka, Liebeszauber, (b) Waltz, Fesche Geister; Three Pieces (Jos. Strauss): (a) Fashion Polka, (b) Polka-Mazurka, Frauenherz, (c) Waltz, Flattergeister; Nine Pieces (Joh. Strauss): Overture, Prince Methusalem; Waltz, Frühlingsstimmung; Pizzicato Polka; Waltz, Wiener Blut; Czardas, from Ritter Pasman; Waltz, Tales from the Vienna Woods; Gavotte from The Arabian Nights; Final Intermezzo from Act I of Eine Nacht in Venedig. 9.0, News. 9.10 (approx.), Dance Music by the Waldemar Hass Band. In an interval at 10.0, Topical Talk. 11.30 (approx.), Close Down.

BERNE.—See Schweizerischer Landessender.

BEROMUNSTER.—See Schweizerischer Landessender.

BODEN.—See Stockholm

BODO.—See Oslo.

## BORDEAUX-LAFAYETTE

986 kc/s, 304 metres; 13 kW.—7.0 p.m., Radio Journal. 7.55, Sports Talk. 8.0, News and Racing Results. 8.5, English Lesson. 8.20, News. 8.30, Gramophone (contd.). 9.0, A lower meuble (To let Furnished)—Comedy in One Act and Two Scenes (Gabriel d'Herவில்லை).

## BRATISLAVA

1,076 kc/s, 279 metres; 14 kW.—6.0 p.m., See Prague. 7.30, Concert by the Station Orchestra, conducted by Byd. Soloists: Actardief (Violin) and Simandl (Cello); Violin Concerto in E (Baelz); Cello Concerto in A Minor (Schumann); Symphony, No. 2 in D Minor, Op. 70 (Dvořák). 9.10, See Prague. 9.25, Gramophone Music. 10.15 (approx.), Close Down.

BREMEN.—See Hamburg.

## BRESLAU

923 kc/s, 352 metres; 60 kW. Relayed by Gleiwitz, 1,184 kc/s, 253 metres.—12.5 p.m. (approx.), Gramophone Concert. 12.45, Time and News. 1.10, Recital of Drinking Songs by Hans Rothensee (Baritone); Vater Noah (Reissiger); Im schwarzen Walfisch zu Askanon; Wenn nur die Rhein nicht wär (Bunger); Im Rolandsbogen (Mania); Der schlesische Zecher (Reissiger); Rheinwein nur aus Römerbechern (Methessel); Der Sang ist verschollen (Sommer). 1.40, Programme arranged by the Post Office with Gramophone Records. 2.0, Agricultural Prices. 2.15, Book Review, The Works of Sven Hedin, the Explorer. 2.35, Programme to be announced. 2.55, Film Review. 3.10, Concert of Light Music by the Kurt Sparrmann Orchestra, relayed from the Kaffee Vaterland. March, Deutschland allezeit (Döring); Waltz, Ein Sommerabend an der Nordsee (Döring); Souvenir de Capri (Bece); Selection from Tiefand (d'Albert); Dance of the Merry Mascots (Ketelbey); Flirtation (Rau); Potpourri, Von Wien durch die Welt (Ilrudy); Chinesischer Märchen-zähler (Dreyer); Goldlocks (Powell). 4.55 (from Gleiwitz), Radio Report from a Sheet Metal Foundry. 5.25, Programme Announcements for the Coming Week. 5.35, Programme to be announced. 6.0, Transmission for all German Stations, relayed from Langenberg. 7.0, News. 7.10, Tallýho! The Hunt is off! Variety Programme. 9.0, Time and News. 9.30, Cigány Music, relayed from Budapest. 11.0 (approx.), Close Down.

## BRNO

878 kc/s, 342 metres; 35 kW.—6.25 p.m. Concert of National Dances: Polonaise in A (Chopin); Gopak from The Fair at Sorotchinsk (Mussorgsky); Polka in E flat (Smetana); Serbian Dances Nos. 2 and 3 (Krstic); Violin Solo: Czardas (Hubay); La Danza (Rossini); Tarantella (Rossini); Violin Solo: Spanish Dance (Sarasate); German Dance (Reger). 7.15, Humorous Reading. 7.30, European Concert, relayed from Budapest. 10.0, See Prague. 10.25, See Budapest.

## BRUSSELS (No. 1)

I.N.R., 590 kc/s, 509 metres; 15 kW.—12 Noon, Concert by the Small Station Orchestra, conducted by Pierre Leemans: Overture, Jean de Paris (Boieldieu); Waltz, Un

jour à Séville (Waldteufel); Wedding Day on Trolldhaugen (Grieg); Millöcker Potpourri (Morena); Cello Solo: Mattinata (Redegheri); Selection from Cavalleria rusticana (Mascagni); Poème (Fibich); Selection from Sunny (Kern); Violin Solo: Foxtro (Gerrebos). 1.0 p.m., Le Journal Parlé. 1.10, Programme by Mickey's Club Jazz Attraction. 4.45, Talk: Commerce in the Belgian Colony. 5.0, Concert by the Station Symphony Orchestra, conducted by Arthur Meulemans: Overture, Antiope (La Gye); Minuet (Opsoner); Tarantella, La danza (Rossini-Lutschensruyter); Flute Solo: Faulstuecke (Gilson); Tarantella (Cui); En sourdine (Crabé); Kaiserwalzer (Johann Strauss); Polka, Tritsch Tratsch (Johann Strauss); Suite funambulesque (Messager). 6.0, Talk: Teaching the Deaf and Blind. 6.15, Talk with Illustrations on the Basque Songs. 7.0, Le Journal Parlé. 7.30, Hungarian Concert relayed from Budapest. In the interval at 8.30, Gramophone Music. 9.10, Talk on the Belgian Author, Prosper Rorlot, with Readings from his Works. 9.25, Concert of Popular Hungarian Music relayed from Budapest. 10.0, Le Journal Parlé.

## BRUSSELS (No. 2)

N.I.R., 887 kc/s, 338.2 metres; 15 kW.—Programme in Flemish. 12 Noon, Dance Music by Mickey's Club Jazz Attraction, conducted by Langlois. 1.0 p.m., Le Journal Parlé. 1.10, Concert by the Little Station Orchestra, conducted by Leemans: Overture, Poet and Peasant (Suppé); Waltz, Gold and Silver (Lehár); Gipsy Song (Baldi); Selection from Il Trovatore (Verdi); Ronde des lutins (Bazzini); Dances from The Bartered Bride (Smetana). 5.0, Dance Music from the Century Hotel, Antwerp. 6.0, Gramophone Music: Leonora Overture, No. 1 (Beethoven); Badinerie (Camus); Cossack Dance from Mazeppa (Tchaikovsky). 6.15, Book Review. 6.30, Concert by the Station Orchestra conducted by Leemans: Overture, Le cheval de bronze (Auber); Petite Suite de Concert (Coleridge-Taylor); Andalusian Song (Fort); Selection from The Prophet (Meyerbeer); Pianoforte Solo, Rapsodie fantastique (Doulez); Soloist: The Composer; Perpetuum mobile (Joh. Strauss). 7.15, Talk: The Canals of Belgium. 7.30, Agricultural Report. 8.0, The Tales of Hoffmann—Operetta (Offenbach), relayed from the Royal Opera House, Antwerp. In the interval, Reading

## BUCHAREST

761 kc/s, 394 metres; 12 kW.—4.0 p.m., Concert by the Station Orchestra: March (Stelzig); Waltz from Eugene Onegin (Tchaikovsky); Overture, Pique Dame (Suppé); Norwegian Dances (Grieg); Selection from Faust (Gounod); Oriental Fantasia (Ketelbey); Selection from Die goldene Meistersin (Eysler); Romanian Potpourri (Dinicu); Intermezzo (Dron). In an interval at 5.0, Radio Journal. 6.0, Educational Talk. 6.20, Gramophone Music. 6.45, Talk. 7.0, See Budapest. 9.0, Radio Journal.

## BUDAPEST

545 kc/s, 550.5 metres; 18.5 kW.—Also relayed on 8.40 metres from 6.0 p.m. (approx.) till Close Down.—4.0 p.m., Talk. 4.30, Talk on the Boy Scout Movement. 5.30, Talk. 6.0, Gramophone Concert. 7.10, News. 7.30, European Concert by the Palestrina Choir and Royal Hungarian Opera House Orchestra, conducted by Dohányi. Soloists and Ludwig Heimlich (Pianoforte); Missa in dedication ecclesiae (Dohányi); Rhapsody for Pianoforte and Orchestra (Béla Bartok); Rhapsody, No. 2 (Liszt). 9.20, Concert of Hungarian Folk Music by the Inre Magyari and Arpad Toll Cigány Bands and Soloists. 10.30, Weather Report. 10.35 (approx.), Jazz Music by the Lann Baker Band, relayed from the Ritz Hotel. 11.30 (approx.), Close Down.

CASSEL.—See Frankfurt.

## COPENHAGEN

1,067 kc/s, 281 metres; 0.75 kW. Relayed by Kalundborg, 260 kc/s, 1,153.8 metres.—11.0 a.m. to 1.0 p.m., String Ensemble Concert, relayed from the Bellevue Strandhotel. 1.30, Gramophone Music. 2.0, Programme for Children. 2.30, Concert by Mogens Hansen's Instrumental Ensemble: March (Mottlau); Romantic Overture (Keler-Béla); Overture, Gianni Schicchi (Puccini); Waltz, Paysage d'automne (Waldteufel); Antique Minnet (Hermannsen); Scandinavian Lullaby (Hermannsen); Waltz from Eugene Onegin (Tchaikovsky); Interlude of Songs from Operetta by Anna Egelund Detlefsen: (a) Song from Katja (Gilbert), (b) Songs from The Gipsy Princess (Kálmán), (c) Song from Die Fledermaus (Strauss), (d) Song from Les briganda (Offenbach); Ballet Music from Le cid (Massenet); Overture, The Merry Widow (Lehár); Pavane pour une Infante défunte (Ravel); Piece in the Form of a Habanera (Ravel); Minuetto (Risager); March, Entry of the Gladiators (Fucik). In an interval

at 3.15, (approx.), Songs from Operetta. 4.30, Exchange and Fish Market Prices. 4.45, Talk: Health Regulations in the Soviet Union. 5.15, French Lesson. 5.45, Weather. 5.54, Announcements. 6.0, News. 6.15, Time Signal. 6.30, Talk: The New Parents' Union through the Eyes of a Parent and of a Teacher. 7.0, Time. 7.1, Concert of Dances by the Radio Orchestra, conducted by Reesen: Pieces (Lumbye): (a) MacMahon March, (b) Cecilia Polka, (c) Columbine Mazurka, (d) Britta Polka; Three Pieces (Möller), (a) Waltz, Souvenir, (b) Japanese Gallop, (c) Mazurka; Waltz, Sölv Myrter (Lumbye); Polka (Lincke); Aarhus Tappentreg (Möller). 8.0, Talk with Readings: Holberg's Epistles. 8.40, Part Relay of the European Concert from Budapest. 9.0, News. 9.15, Cigány Music, relayed from Budapest. 10.15, Dance Music by the Teddy Petersen Band, relayed from the Wivex Restaurant. In the interval at 11.0, Time. 11.15 (approx.), Close Down.

CORK.—See Athlone.

## CRACOW

959 kc/s, 312.8 metres; 1.5 kW.—6.5 p.m., Topical Talk. 6.20, Miscellaneous Items. 6.25, See Warsaw. 7.15, Gramophone Music. 7.30, See Budapest. 8.30, See Warsaw. In an interval at 9.10, Gramophone Music and Sports Notes. 11.0 (approx.), Close Down.

DANZIG.—See Heilsberg.

DRESDEN.—See Leipzig.

## FECAMP

1,328 kc/s, 225.9 metres; 10 kW.—11.0 to 12 Noon, Programme in English by the I.B.C. Happy Hour. Part I, Orchestral Music: Signature Tune; Selection from He wanted Adventure (Waller); Memories of Paris (Moretti); When the Lilac Blooms again (Rotter); I kiss your Lips (Rudolph); Selection of War Marching Songs; Sleepy Valley (Hanley); The Dwarf's Patrol (Rathke); Dream of the Ocean (Gungl); Part II, Dance Music: My Favourite Band; Sing another Line; Let the World go drifting by; I'll keep you in my Heart always; Five fifteen; Forever; Blue Cloud; Music bath (Charms); Signature Tune. 12 Noon, French Programme. 4.30 to 6.0, Programme in English by the I.B.C. 4.50, I.B.C. Nursery Corner. 5.0, Orchestral Concert for Tunbridge Wells and Isle of Thanet Listeners: Signature Tune; The Night by the Sea; Waltz, Tres jolie (Waldteufel); Siciliana Serenata (Schmalstich); Song, Love is king to-day; Babes in Toyland (Herbert); Now I'm in love (Shapiro); Reconciliation (Drigo); Song, Throw open wide your Window (Calson); Ponce valsante (Poldini). 5.30, Octet Concert for Dover and Folkestone Listeners: Romance (Rubinstein); Hindu Song (Rimsky-Korsakov); Song, The Blackbird in the Apple Tree (Lubbock); Golliwog's Cakewalk (Debussy). 1.45, Concert of Light Music: The Grasshopper's Dance (Bucalossi); Twilight on the Water (Squire); Song, Fairy Tales of Ireland (Coates); Sans Souci (von Blon). 6.0, French Programme. 11.0 till Close Down, Programme in English by the I.B.C. 11.0, Tunes from the Talkies; Signature; Sittin' in the Dark; In the Park in Paree (Rainger); Selection from Congress Dances (Heymann); Heaven will protect an honest girl (Weston); Let's all be happy together (Leslie); There's Magic in the Air (Byton); My, oh, My! (Gordon); I've got to pass your house; You don't understand (Ellis); Signature Tune. 11.30, Concert by the International Broadcasting Company (Ireland), Ltd.: Signature Tune, Come back to Erin; Woodland Peace (Favilla); Wedgewood Blue (Ketelbey); Glockenspiel Solo, The Black Forest Chiming Clock (Doppler); Song, Molly Bawn (Lover); Cœur brisé (Gillet); Savourenn Deelish (Traditional); My dream (Waldteufel); Sari Waltz (Kalmán); Signature Tune, Come back to Erin. 12.5 a.m. (Sunday), I.B.C. News Bulletin in English. 12.10 (approx.), Club Concert for Burnley Listeners. Part I: Signature Tune, The Chum Song; Lazybones (Lawrence); Isn't this a Night for Love (Burton); Mademoiselle (Nesbitt); Then the Moon came out (Miller); Oh, Johanna! (Lawrence); Sleep on (Korngold); I hate to leave you now (Armstrong). Part II, Dance Music by Joe Loss and his Band (Electrical Transcriptions): Isn't it Heavenly (Hamburg); Under a Blanket of Blue (Symes); Reflections in the Water (Webster); Mary Rose (Parr-Davies); Sentimental Gentleman from Georgia (Perkins); Happy Ending (Parr-Davies); Signature Tune. 1.0, Dance Music: Signature Tune, Belles of Normandy; Sing another Line; You're an old Smoothie; Forever; My Lucky Day; I live for Love; Isn't it Heavenly? There's a Cabin in the Pines; Sweetheart Darlin'; Tick, Tock; Twelfth Street Rag; At the Old Pig and Whistle; My Moonlight Madonna; Avalon; I'm getting sentimental over you; Spanish Eyes; I've found the Right Girl; Signature Tune. 2.0, I.B.C. Goodnight Melody and Close Down.

FLensburg.—See Hamburg.

FLORENCE.—See Turin.

## FRANKFURT

1,157 kc/s, 259.3 metres; 17 kW. Relayed by Cassel and Trier, 1,157 kc/s, 259.3 metres.—12.15 p.m., Time and News. 12.25, News and Weather. 12.35, Dance Music and Variety Music on Gramophone Records. 1.30, Pro-

NOV. 4th **SATURDAY** continued

gramme for Young People—Talk on America and American Folk Songs. 2.15, See Stuttgart. 2.30, Weather. 2.40, Time and Economic Notes. 3.0, See Stuttgart. 5.0, Talk: The Frontier. 5.20, Review of the Week. 5.35, A Surprise Programme. 5.50, Weather and News. 6.0, Transmission for all German Stations, relayed from Langenberg. 7.0, Topical Talk. 7.10, Langenberg, Stuttgart, and Frankfurt Exchange Programme—With 500 Kilowatts; Bunter Abend. 9.0, Time and News. 9.20, See Stuttgart. 9.30, News. 10.0 till Close Down. See Stuttgart. 1.0 a.m. (Sunday), Close Down.

**FREDRIKSTAD.**—See Oslo.

**FREIBURG.**—See Stuttgart.

**GENEVA.**—See Radio-Suisse Romande.

**GENOA.**—See Turin.

**GLEIWITZ.**—See Breslau.

**GOTEBORG.**—See Stockholm.

**GRAZ.**—See Vienna.

**HAMAR.**—See Oslo.

**HAMBURG**

806 kc/s, 372 metres; 1.5 kW. Relayed by Bremen, 1,112 kc/s, 269.8 metres; Flensburg and Hanover, 1,319 kc/s, 227.4 metres; and Kiel, 1,292 kc/s, 232.2 metres.—3.0 p.m., Concert by the Philharmonic Orchestra, conducted by José Eibenschütz. Overture, The Flying Dutchman (Wagner); Andante cantabile for Strings (Tchaikovsky); Festliche Musik (Franckenstein); The Moldau (Smetana); Ballet Music from La Gioconda (Ponchielli); Waltz, Barcarolle (Waldteufel). 4.0, Topical Programme. 4.30, Variety Programme. 5.35 (from Kiel), Religious Address. 5.50, Weather. 6.0, Transmission for all German Stations, relayed from Langenberg. 7.0, Readings. 7.30, European Concert, relayed from Budapest. In the interval at 8.0, News. 9.10, Time and News. 9.30, Concert, relayed from Budapest. 10.15, Concert by the Small Station Orchestra. 12 Midnight, Close Down.

**HANOVER.**—See Hamburg.

**HEILSBURG**

1,085 kc/s, 276.5 metres; 60 kW. Relayed by Danzig, 662 kc/s, 453.2 metres.—12.5 p.m., Gramophone Concert of Light Music. In the intervals at 12.20 and 1.0, News. 1.30, Programme arranged by the Post Office with Gramophone Records. 2.0, Agricultural Prices and Exchange. 2.30, Handwork Lesson for Boys. 3.0 (from Danzig), Concert by the Danzig State Theatre Orchestra, conducted by Ernst Kallipke. Overture, Titus (Mozart); Ballet Music from Czar and Carpenter (Lortzing); Waltz from The Count of Luxembourg (Lehár); Dance from La Gioconda (Ponchielli); Overture, Russian and Ludmilla (Glück); Valse lente (Schütt); Selection from The Barber of Seville (Rossini); Waltz, A Peasant Wedding in Carinthia; Poème d'extase (Bullerian); Overture to a Revue (Lincke). In an interval at 4.0 (approx.), A.D.A.C. Traffic Report. 5.0, Programme Announcements for the Coming Week. 5.15, Agricultural Prices. 5.20, Hunting Songs to the Lute by Hans Elbe, with Commentary. 5.55, Weather. 6.0, Transmission for all German Stations, relayed from Langenberg. 7.0, News. 7.10, East German Military Programme. 8.10, St. Hubert's Day—Programme by the Station Male Voice Choir, conducted by Firehow, the Königsberg Opera House Orchestra, conducted by Georg Wöllner, and the French Horn Quintet. In the interval, Reading of Hunting Stories. 9.25, News. 9.30 (approx.), Gipsy Music, relayed from Budapest. 11.0 (approx.), Close Down.

**HILVERSUM**

1,013 kc/s, 296.1 metres; 7 kW up to 5.40 p.m.; and 20 kW from 5.40 p.m.—Programme of the Workers' Radio Society (V.A.R.A.). 11.40 a.m., Concert of Light Music. The searcher (Rosey); Waltz, Pomona (Waldteufel); Souvenirs de Capri (Bece); Serenade (Caludi); Dividenden (Morena); Interlude of Gramophone Records; Scandinavian Suite (Friederiken); Argentine Tango (Manfred); Bolero (Maufred); A Perfect Day (Bond); Wenn man sein Herz verliert (Stransky); Nino de las Palmas (Lucchesi). 12.40 p.m., Concert by the Small Station Orchestra, conducted by De Groot. Slammat Makan (Westenberg); Birthday Greeting (Ketebe); Schubert Potpourri (Urbach); Pumpernickel (Siede); Selection from The Cinema Star (Gilbert); My Song of Love for You (Albers); Es war einmal ein Zigeuner (Eimeg); Selection from Frau Luna (Lehár). 1.40, Interval. 1.55, Gramophone Records. 2.30, Talk. 2.50, Concert by the Station Balalaika Orchestra, conducted by Povariev. Russalka (Bojardin); Two Guitars (Horlick); Selection from Fiametta (Minkus); Kasbock; Czardas (Povariev). 3.10, Cinema Talk. 3.25, Balalaika Concert (cont'd.). Andante cantabile (Tchaikovsky); Gaida (Povariev). 3.40, Gramophone Music. 4.10, Song and Organ Recital. Coronation March (Meyerbeer); Songs: O du mein holder Abendstern (Wagner). (b) The Rosary (Nevin); Serenade (Moskowsky); Poupée valante (Pohlmi); Gipsy Moon (Borganov); Songs: (a) Song from The Desert Song (Romberg). (b) Melody (Bece). 4.40, Gramophone Records. 5.25, Concert by the Station Orchestra, conducted by de

Groot. Herbstrosen (Strauss); Chant d'automne (Tchaikovsky); Romance d'automne (Alberti); Autumn Crocus (Mayerl). 5.52, Talk on Literature. 6.10, Concert (cont'd.). Puppen-spiele (Lederer); My Lady Brocade (Ketebe); Am Bosporus (Lincke); Suppé Potpourri (Urbach). 6.40, V.R.O. Programme. 7.40, Dance Music. Soloist Mlle. Slijn (Songs). Stampede (Henderson); Das ist das einzig Wahre (Stolz); Ich liebe Dich (Rosen); Lazy Bones (Carnichael); Alle Männer sind wie Kinder (Mildemissner); Mein Glück bist Du (Jurmamu); I cover the Waterfront (Green); Two Hearts and a Waltz Refrain (Stolz); Fox Trot from Der Korvettenkapitän (Kaper); Seven Years with the Wrong Woman; Tiger Rag (Rocca). 8.25, Talk. 8.35, News. 8.40, Programme from Budapest. 9.10, V.A.R.A. Notes. 10.15, Instrumental Concert. 11.10, Gramophone Music. 11.40 (approx.), Close Down.

**HORBY.**—See Stockholm.

**HUIZEN**

160 kc/s, 1,875 metres; 7 kW until 3.40 p.m. Transmitted from Kootwijk on 50 kW from 3.40 p.m.—Programme by the Catholic Radio Society (K.R.O.). 11.40 a.m., Police Notes. 11.55, Concert by the K.R.O. Boys, conducted by Lustenhouwer. Gramophone Records in the intervals. 1.40 p.m., Programme for Young People. 2.10, Programme for Children. 3.40, Programme of the I.L.R.O. (Hebrew Radio Society). 4.40, Lesson in Cadigraphy. 5.10, News in Esperanto. 5.25, Gramophone Music. 5.35, Wireless Notes. 5.50, Gramophone Music. 6.0, Press Review. 6.25, Gramophone Music. 6.40, Police Notes. 6.55, Literary Talk. 7.15, Gramophone Records. 7.25, Concert by the K.R.O. Orchestra, conducted by van 't Woud. Per Aspera ad Astra (Urbach); Rapsodie dahoméenne (de Boeck); Moonlight on the Alster (Fétras); Canzonetta (Fillipucci); Hungarian Rhapsody, No. 2 (Liszt). 7.55, Recital on Two Pianofortes. Can't we talk it over (Washington and Young); Paradise (Brown); The red and the blue blues (Edward). 8.5, News and Gramophone Records. 8.25, Concert (cont'd.). March, Stars and Stripes (Souza); Potpourri (Koenigsmann); The Rosary (Nevin); Viennese Operetta Potpourri (Robrecht). 8.55, Recital on Two Pianofortes (cont'd.). Selection from Naïla (Delibes); Butterflies in the Rain (Reaves and Myers). 9.5, Concert (cont'd.). Hungarian Dances, Nos. 5 and 6 (Brahms); Die Schönebrunnen (Lanner); Der Tausendkünstler (Blankenburg); Overture, William Tell (Rossini); Gramophone Records. 10.0, Recital on Two Pianofortes (cont'd.). 10.15, Concert by the K.R.O. Boys, conducted by Lustenhouwer. 11.40 (approx.), Close Down.

**INNSBRUCK.**—See Vienna.

**JUAN LES PINS**

1,205 kc/s, 249 metres; 0.8 kW.—8.0 p.m., Amusement Guide, Financial Notes, Racing Results, and News. 8.10, Radio Concert. In an interval at 9.0, News and Weather.

**KALUNDBORG.**—See Copenhagen.

**KIEL.**—See Hamburg.

**KLAGENFURT.**—See Vienna.

**KOSICE.**—See Prague.

**LAHTI**

167 kc/s, 1,796 metres; 40 kW. Relayed by Helsinki, 815 kc/s, 368.1 metres.—5.35 p.m., Violin Duets. 5.55, Talk. 6.15, Concert by the Station Orchestra, conducted by Linko. Waltz from The Sleeping Beauty (Tchaikovsky); Selection from Frasquita (Lehár); Polovtsian Dances from Prince Igor (Borodin); Selection from The Flower of Hawaii (Abraham). 7.15, Dramatic Programme. 7.45, News in Finnish. 8.0, News in Swedish. 8.15, Dance Music by the Melody Boys Orchestra, relayed from the Grand Restaurant. 10.0 (approx.), Close Down.

**LANGENBERG**

635 kc/s, 473 metres; 60 kW.—12.25 p.m., News and Weather. 12.35 to 2.15 p.m., See Frankfurt. 2.15, See Stuttgart. 2.30, Market Prices. 2.40, Reading. 2.50, Political Announcements. 3.0, See Stuttgart. 5.0, See Frankfurt. 5.20, Dr. Oskar Korppa reports on his Excavation Work in the Cathedral at Xanten. 5.35, Variety Programme. 5.50, Announcements. 6.0, Transmission for all German Stations. Rhinish Poetry—Radio Sequence (Otto Bries), with Music by Wilhelm Maler. 7.0, See Frankfurt. 7.10, Langenberg, Stuttgart, and Frankfurt Exchange Programme. With 500 Kilowatts—Bunter Abend. 9.0, Time and News. 9.20, See Stuttgart. 9.30, News and Weather. 9.40 to 1.0 a.m. (Sunday), See Stuttgart. 1.0 a.m. (Sunday), Close Down. **LAUSANNE.**—See Radio-Suisse Romande.

**LEIPZIG**

769.9 kc/s, 389.6 metres; 120 kW. Relayed by Dresden, 941 kc/s, 319 metres.—11.0 a.m., Weather and Time. 11.5, Gramophone Con-

cert: Invitation to the Dance (Weber); Ballet Music (Schubert); Entr'acte Music, No. 2 (Schubert); Leonore (Schütt-Löns); Wir huzen himans in die sonnige Welt (Ohlbanns); Potpourri of Verdi's Opera Music; Wine, Woman and Song (Joh. Strauss); Am Rhein (Humperdinck); An der Weser (Pressel); Sei nicht böse from Der Obersteiger (Zeller); Air from The Bird Fancier (Zeller); Serenade, Schön ist jeder Tag, den du mir schenkst Marie Luise (Meisel); Two Arias from Eine Nacht in Venedig (Joh. Strauss); Selection from The Land of Smiles (Lehár). 12.15 p.m., News. 12.30 (from Dresden), Concert by the Pleitzsch-Marko Trio; Serenade, Canzone d'aprile (Cortopassi); Adoration (Jungherr); Spanish Serenade (de Micheli); Minuetto Civettuolo (Amadei); Reigen from Peterchens Mondfahrt (Schmalstiel); Morgendliches Ständchen (Heber); Amati-Serenade (Becker); Waltz, Viviane (Richter); Serenade, Notte di leggenda (Cortopassi); Elevation (Kasse); Intermezzo, Love's Dream after the Ball (Czibulka); La Follietta (Marchesi). 1.15, News. 1.30, Programme for Children. 2.10, Review of Economics. 2.30, Talk: Agrarian Policy. 2.45, Market Prices and Weather. 3.0, See Hamburg. 4.0, A Modern Dictionary. 4.20, Gramophone Concert. 5.0, Talk: The German Language. 5.20, Topical Talk. 5.30, Talk: An Evening on the River. 5.50, Review of the Day's Events. 6.0, Transmission for all German Stations, relayed from Langenberg. 7.0, Reading (Theodor Fontaine). 7.30, European Concert, relayed from Budapest. 9.15, News and Sports Notes. 10.0, Hungarian Concert, relayed from Budapest. 11.0 (approx.), Close Down.

**LINZ.**—See Vienna.

**LJUBLJANA**

522 kc/s, 574.7 metres; 7 kW.—5.0 p.m., Gramophone Records and Traffic Report. 5.30, Talk. 6.0, Talk on Philosophy. 6.30, Review of Foreign Affairs. 7.0, Hungarian Concert, relayed from Budapest. 9.0, Weather and News. 9.15, Concert by the Station Orchestra. 10.0 (approx.), Close Down.

**LUXEMBOURG**

352 kc/s, 1,191 metres; 200 kW.—French Evening. 7.0 p.m., Gramophone Concert of Debussy Music: Suite, Iberia; L'île joyeuse. 7.35, Trio No. 1 (Beethoven). 8.0, Concert by the Station Orchestra, conducted by Henri Pensis: Overture, Poet and Peasant (Suppé); Waltz, Morgenblätter (Joh. Strauss); Selection from Faust (Gounod); Humoresque (Dvorak); Selection from Les Millions d'Arlequin (Drigo); Folk Melody, 's kommt ein Vogel geflogen (arr. Ochs). 8.50, News in French. 9.0, Luxembourg's Musical Medley. Variety Concert by the Station Orchestra and Soloists. 9.50, News in German. 10.0, Dance Music on Gramophone Records.

**LWOW**

788 kc/s, 381 metres; 16 kW.—6.5 p.m., Announcements. 6.25, See Warsaw. 6.40, Programme Announcements. 6.45, See Warsaw. 7.0, The Letter Box. 7.15, Gramophone Records. 7.30, European Concert, relayed from Budapest. 8.30, See Warsaw. 9.10, Talk: London by Day and by Night. 9.25, See Warsaw. 9.35, Gramophone Records. 9.40, Hungarian Folk Music, relayed from Budapest. 10.15, Dance Music on Gramophone Records, relayed from Warsaw. 10.20, Gramophone Music. 11.0 (approx.), Close Down.

**LYONS**

LA DOUA, 644 kc/s, 465.8 metres; 1.5 kW.—7.30 p.m., Radio Gazette for Lyons and the South East. 8.30, Gala Concert, relayed from the Salle Rameant. After the Concert: News Bulletin.

**MADRID**

ARANJUEZ (EAQ), 10,000 kc/s, 30 metres; 20 kW.—6.0 to 8.0 p.m., Programme for Listeners in the Canary Island, Guinea and Europe. 6.0, Light Music. 7.15, Talk. 7.30, Light Music. 8.0, Interval. 10.30, Concert of Popular Music. In the interval at 10.45, Radio Chronicle. 11.35, Light Music. 12 Midnight to 12.30 a.m. (Sunday), Programme in English by the I.B.C.: Concert; Danza de Cosacos; Louis XIII; Polonaise in A flat major (Chopin); Träumerei (Schumann); Allegretto (Bach); La Précieuse; Scherzo in E Minor (Mendelssohn). 12.30, I.B.C. Good-night Melody and Close Down.

**MADRID**

EAJ7, 707 kc/s, 424.3 metres; 2 kW.—7.0 p.m., Chimes, Exchange, Radio Journal, Talk and Dance Music. 8.15, Topical Review. 8.30 to 9.15, Interval. 9.15, English Lesson. 9.30, Chimes, Time and Topical Review. 9.45 (approx.), Variety Programme. 11.45, Topical Review. 12 Midnight, Chimes and Close Down.

**MALMO.**—See Stockholm.

**MILAN.**—See Turin.

**MORAVSKA-OSTRAVA**

1,137 kc/s, 263.8 metres; 11 kW.—3.0 p.m., Military Band Concert. 3.50, See Prague. 4.45, Gramophone Music. 4.55, Weekly Review. 5.5, Talk: The Castle of Slezská Ostrava and its History. 5.15, See Prague. 5.25, Concert by the Station Quartet: String Quartet No. 2 (Wachsmann); Waltzes Nos. 1 and 4, Op. 51 (Dvorak). 6.0, See Prague. 7.15, Talk. 7.30, European Concert, relayed from Budapest. 9.10, See Prague. 9.25, See Budapest.

**MOSCOW**

TRADES UNION, 300 kc/s, 1,000 metres; 100 kW.—10.45 a.m., Weather. 1.45 p.m., Opera (Rimsky-Korsakov). 3.30, Literary and Musical Programme. 4.30, Programme for Young People. 5.30, Prokofiev Concert by the Symphony Orchestra, conducted by Dranchikov. Soloists: The Composer (Pianoforte) and Rojdestvenskaya (Soprano). 8.0, News. 8.30, Programme Announcements. 8.55, Chimes from the Red Square. 9.5, Press Review. 10.0, Weather.

**MOTALA.**—See Stockholm.

**MUHLACKER.**—See Stuttgart.

**MUNICH**

563 kc/s, 533 metres; 60 kW. Relayed by Augsburg and Kaiserslautern, 536 kc/s, 560 metres, and Nürnberg, 1,256 kc/s, 239 metres.—3.30 p.m., Orchestral Concert: Overture to a Revue (Lincke); Idyll (Humphries); Selection from Martha (Florentin); Waltz, In Saum und Seide (Zieher); Selection from The Merry Widow (Lehár); Gavotte-Intermezzo, Schattenspiele (Fink); Austrian Peasant Dances (Pachernegg); March, Freiheit und Ehre (Lankner). 4.45, A Play for Young People (Kuhnert). 5.30, Recital of German Folk Songs. 5.45, Wireless Notes. 6.0, Transmission for all German Stations, relayed from Langenberg. 7.0, Bunter Abend: The Station Orchestra, the Branlich Dance Band, Marius Andersen (Tenor) and Albert Lillecluer (Tidler). 8.15, Dance Music. 9.0, Time and News. 10.0, Gipsy Music, relayed from Budapest. 11.0 (approx.), Close Down.

**NAPLES.**—See Rome.

**NOTODDEN.**—See Oslo.

**OSLO**

277 kc/s, 1,083 metres; 60 kW. Relayed by Fredrikstad, 815 kc/s, 368.1 metres; Hamar, 522 kc/s, 574.7 metres; Notodden, 671 kc/s, 447.1 metres; Porsgrund, 662 kc/s, 453.2 metres and Rjukan, 671 kc/s, 447.1 metres. 3.30 p.m., Light Music on Gramophone Records. 4.15, Programme for Children. 5.15, Hardanger Fiddle Recital of Norwegian Music. 5.45, Talk on Economics. 6.0, Announcements, Weather and News. 6.30, Violin and Flute Recital by Rolf Myklebust and Birne Helmer Maess. Suite for Flute (Vorley); Violin Solos (Grieg): (a) Berceuse, (b) Melody, (c) Dance of the Elves; Violin Solo, Bohemian (Ulfrstad). 7.0, Time Signal. 7.1, Talk. 7.20, Concert by the Station Orchestra, conducted by Kramm. March, (Dreyer); Overture, Isabella (Suppé); Selection from The Queen of Sheba (Goldmark); Berceuse (Burmester); Piece (Bernhard); Czardas (Michiels); Selection from Les Cloches de Corneville (Planquette); Svundne dage (Reidarsen); Waltz (Durand); Polka (Waldteufel); Swedish Coronation March (Svensson). 8.40, Weather and News. 9.0, Topical Talk. 9.15, Humorous Recitations. 9.45, Dance Music on Gramophone Records. 11.0 (approx.), Close Down.

**OSTERSUND.**—See Stockholm.

**PALERMO**

558 kc/s, 537.6 metres; 3 kW.—7.0 p.m., Dopolavoro Notes, Tourist Talk. Agricultural Report and Giornale Radio. 7.20, Gramophone Music. In the intervals at 7.25, Sports Notes, and at 7.30, Time and Announcements. 7.45, See Rome. 8.0, Il Re di Chez Maxim—Operetta in Three Acts (Mario Costa). In the intervals, Book Review and Notes. After the Operetta, Giornale Radio.

**PARIS**

EIFFEL TOWER. Call FLE, 207.5 kc/s, 1,445.7 metres; 13 kW. Time Signals (on 2,650 metres) at 9.26 a.m. and 10.26 p.m. (Preliminary and G-dot Signals).—5.45 p.m., Le Journal Parlé. 7.30, Les Châteaux en Espagne (Castles in the Air)—Comedy in Five Acts (d'Harleville). 9.0 (approx.), Close Down.

**PARIS**

POSTE PARISIEN, 914 kc/s, 328.2 metres; 60 kW.—7.0 p.m., Schumann Music on Gramophone Records. 7.15, Le Journal Parlé and Review of the Foreign Press. 7.35, Extracts from Werther (Massenet) on Gramophone Records. 8.0, Talk on the Theatre. 8.10, Interval. 8.30, Songs. 9.0, Interval. 9.10, Concert. 11.0, News.

**PARIS**

RADIO-PARIS, Call CFR, 174 kc/s, 1,725 metres; 75 kW.—6.45 a.m., Physical Culture. 7.30, Weather and Physical Culture. 7.45, Gramophone Records: Poupées de Paris (Loyraux); Cuba in Paris (Castellanos); You (Monfred); Seduction (Cazes). 8.0, Press Review and Weather. 9.0, Concert by the Conservatoire Concert Society, re-

NOV. 4th SATURDAY continued

laid from the Old Conservatoire. 11.30, Interval. 12.9 Noon, Gramophone Concert: Viva Cuba (Curti-Muscari); Per Aspera ad Astra (Urbach); Wienerisch (Messier); Tu m'as juré (Matis-Lenoir); Alabama (Marceau); You are my Heart's Delight (Lehár-Waltham); Le Soir ou l'on dit je t'aime (de Bozi-Cools); Serenata (Monti); Visages jaunes (Messier); Colo-Colotte (Arnaud-Marwys); Chloé (Moret); Glow-worm Gavotte (Lücker); Oh, Mademoiselle Marguerite (Liossas); Miami (Loyraux); Prince Charming (Parès-v.Parys); Insh' Allah (Padi-lla); My Rosina (Nelly-Halet); Eternel Printemps (Popy); Vagabond's Song (Richmann); Jouiou (Fischer); J'ai deux amours (Scott); Adoration (Philippon); I know a Blonde (Goety-Sloane); Bandoon (Spiana); Aubade (Livshakov); I can't live without you (Oberfeld); La Renversée (Rualten); The Wave (Metra); The Hat (Noel); Singing in the Rain (Nacio-Herz-Brown); Mon Village du Tyrol (Marceau); What for (Oberfeld); La Mousmée (Kramer-Agator); Vous dansez Marquise (Lemaire); Melody (Jekill-Hely). In the intervals at 1.0 p.m., Exchange, News and Weather, and at 1.30, Exchange, 2.0, Exchange, 3.0, Programme for Children, 3.45, Exchange and Market Prices, 4.20, Agricultural Talk, 6.45, Gramophone Records: Lynette (Paradis); Lucienne (Curti); L'amour fleuri (Dan-jaume), 7.0, Talk on Science, 7.20, Gramophone Music: Operetta Potpourri (Miskaki); C'est Jean de la Lune (Auge); Lucuras (Alongi); Lake Michigan (Heymann); Kissing is no Sin (Eysler); Melody (Lawrence-de Buscuil-Fevre); Les vieilles larmes (Mil-landy); Hymn à l'infanterie de Marine (Cappé), 7.45, Review of the Latin Press, 8.0, News by the Caricaturist Morris, 8.30, News and Weather, 8.40, Review by Dorin, 8.45, An Evening in Alcazar in 1900—Variety Programme. In the interval at 9.15, Press Review and News, 10.0, Gramophone Records: Collegiana (Boux-Jasse); Love Song (Klenner-Varna); Hungarian Tango (Gasag); Air (Learsi); Melody (Col-lins); Along the Minnetonka (Lieurance); Christina (Gottler). The most beautiful Dream (Arezza); Selection from Lilac Time (Schubert-Berté).

PITTSBURGH

KDKA, 980 kc/s, 306 metres; 50 kW.—Relayed by W8XK on 48.86 metres and 25.27 metres.—7.0 to 11.0 p.m., New York Relay, 7.0, Musical Originalities, 7.30, Concert Echoes, 8.0, Words and Music, 8.30, Wealth of Harmony, 9.0, Dance Masters, 9.30, Concert Favorites, 10.0, Casino Orchestra, 10.30, Neil Sivers, 10.45, Orphan Annie, 11.0, News, Piano Classique, 11.15, Sports, Pat Haley, 11.30, A Recreo, Bill and Alex, 11.45, Al Williams, 12 Midnight, Happy Felton's Orchestra 12.30 to 3.0 a.m. (Sunday), New York Relay, 12.30, Circus Days, 12.45, Annie, Judy and Zeke, 1.0, Waldorf Astoria Orchestra, 1.30, Sous les Ponts de Paris, 2.0, Jamboree, 3.0, Behind the Law.

PORSGRUND.—See Oslo.

POZNAN

896 kc/s, 335 metres; 1.9 kW.—6.5 p.m., Variety Items, 6.25, See Warsaw, 6.40, Programme Announcements, 6.45, See Warsaw, 7.30, Part Relay of the European Concert from Budapest, 8.30, See Warsaw, 9.10, Talk, 9.25, Sports Notes and Time Signal, 9.40, Cigány Music, relayed from Budapest, 10.0 till Close Down, See Warsaw.

PRAGUE

614 kc/s, 488.6 metres; 120 kW.—3.0 p.m., See Moravská-Ostrava, 3.50, Talk: Immortal Figures of World Literature—Don Quixote and Sancho Panza, 4.15, Talk on Economics, 4.25, Gramophone Music, 4.30, Czech Lesson for Germans, 4.45, Opening of the Radio Club Exhibition, relayed from the Sokol House, 5.5, Agricultural Report, 5.15, Talk for Workers, 5.25, News in German, 5.30, German Transmission: Talk on Music, 6.0, Time and News, 6.10, Brass Band Concert, 7.15, Talk, 7.30, European Concert, relayed from Budapest, 9.10, Time and News, 9.25, See Budapest, 10.15 (approx.), Close Down.

RADIO-SUISSE ROMANDE

SOTTENS, 743 kc/s, 403 metres; 25 kW; and Geneva, 395 kc/s, 760 metres.—6.0 to 6.15 a.m. (from Lausanne), Gymnastics, 11.25, Time Signal from Neuchâtel Observatory, 11.30, News and Weather, 11.40 (from Geneva), Gramophone Concert, 12.0 Noon, Financial News, 12.10 p.m. (from Geneva), Gramophone Music, Sound Film Music. Selection from Der Geist des Wajewodan (Grossmann); Polka, Auf leichten Füßchen (Pörschmann); Songs by (a) The Boswell Sisters, (b) Al Jolson, (c) Bing Crosby; Two Songs; Selection from Das Lied der Liebe (Strass-Kornigold), 1.0 to 2.58, Interval, 2.58, Time Signal from Neuchâtel Observatory, 3.0 (from Lausanne), Concert by the Small Radio Lausanne Orchestra, 3.45, Concert, relayed from Lugano, 5.0 (from Geneva), Programme for Children, 5.20 (from Geneva), Programme for Young People, 5.40 (from Geneva), Film Notes, 6.10 (from Geneva), Interlude by Georges Verdène, 6.30 (from Geneva), Weather and Announcements, 7.0 (from Geneva), Theatre Talk, 7.20 (from Geneva), Introductory Talk to the following Transmission, 7.35 (from Geneva), Concert by the Radio Orchestra, conducted by Ernest

Ansermet, relayed from the Reformation Hall. Soloist: Mme. Maria Panthès (Piano-forte), Leonora Overture No. 2 (Beethoven); Pianoforte Concerto in D minor (Brahms); Selection from Le Bourgeois gentilhomme (Richard Strauss), 9.0 (approx.), News and Weather, 9.10 (from Geneva), Talk: The Work of the League of Nations, 9.30 (from Geneva), Dance Music on Gramophone Records, 10.30 (approx.), Close Down.

REYKJAVIK

250 kc/s, 1,200 metres; 21 kW.—11.0 a.m., Weather Forecast, 1.15 p.m., Variety Programme, 4.0, Weather Forecast, 8.10, Weather Forecast, 8.20, Light Music and Announcements, 9.0, Light Music, 9.30, Talk, 10.0, Time and News, 10.30, By the Fireside—Musical Programme, followed by Dance Music, 1.0 (approx.), Close Down.

RIGA

572 kc/s, 525 metres; 15 kW.—4.30 p.m., Organ Recital, 5.0, French Lesson, 5.20, Weather, 5.30, An Opera (Alfred Kalnins), relayed from the National Opera House. Conductor: Janis Kalnins. In the intervals, News and Weather, 9.0, Modern Dance Music, relayed from the Café Schwarz, 10.0 (approx.), Close Down.

RJUKAN.—See Oslo.

ROME

Call 1RO, 680 kc/s, 441 metres; 50 kW.—Relayed by Naples, 941 kc/s, 319 metres; Milan (Vigentino), 662 kc/s, 453.2 metres from 7.45 p.m., and 2RO, 11,810 kc/s, 25.4 metres, from 4.15 p.m.—12 Noon to 1.15 p.m., Orchestral Concert. In the intervals at 12.30, Giornale Radio, and at 1.0, Time and Announcements, 3.30, Children's Radio Review, 3.55, Giornale Radio and Report of the Royal Geographical Society, 4.10, Weather, 4.15 to 5.0, Orchestral Concert, 5.40 (Naples), Shipping and Sports Notes, 5.45, Morse Signals and Dopplavoro Notes, 6.0, Tourist Report, 6.10, Agricultural Report and Wheat Market Report, 6.20, News in Foreign Languages, 6.40, Giornale Radio, 7.0, Time and Announcements, 7.15, Gramophone Music, 7.30, Giornale Radio and Sports Notes, 7.45, Italian Anthems; Marcia Reale (Gabetti); Giovezza (Blanc); La leggenda del Piave (Mario), 8.0, La belle Hélène—Opera in Three Acts (Offenbach), relayed from the Argentina Theatre. In the intervals, Recitations and Announcements. After the Opera, Giornale Radio.

SALZBURG.—See Vienna.

SCHENECTADY

WGY, 790 kc/s, 379.5 metres; 50 kW.—Relayed at intervals by W2XAF, on 31.48 metres and by W2XAD on 19.56 metres.—2.45 a.m. (Sunday), Stock Reports, 1.0, Variety Programme, 1.30, Ulica Singers, 1.45, Musical Programme, 2.0 to 4.0, New York Relay, 2.0, Baron Munchausen, Comedian, 2.30, Leo Reisman's Orchestra; Four Yacht Club Boys, 3.0, Saturday Night Dancing Party, 4.0, Programme Resumé.

SCHWEIZERISCHER

LANDESENDER

BEROMUNSTER, 653 kc/s, 459 metres; 60 kW.; Basle, 1,229 kc/s, 244.1 metres; and Berne, 1,220 kc/s, 245.9 metres.—5.50 to 6.5 a.m. (from Berne), Gymnastics, 11.0 (from Berne), Austrian and French Waltzes on Gramophone Records, 11.29, Time Signal from Neuchâtel Observatory, Weather and News, 11.40 (from Berne), Talk: The Week in the Federal Assembly, 11.50 (from Berne), Light Music on Gramophone Records, 12.15 p.m. (from Berne), Song Recital, 12.25, Time, Weather and Exchange, 12.30, Request Gramophone Records, 12.45 (from Basle), Book Review, 1.15 (from Basle), Popular Concert with Zither Music and Yodels, 2.0 to 3.0, Interval, 3.0 (from Basle), Talk, with Illustrations on the Accordion Recital with Gramophone Inter-ludes, 3.45, Concert, relayed from Lugano, 5.0 (from Basle), Opera and Operetta Music on Gramophone Records, 5.30 (from Basle), Talk on Swiss Week, 6.0, Chimes from Zürich Churches, 6.15 (from Basle), Arias and Duets from Little-known French Opera, by Lotte Jenny (Soprano), and Hans Vischer van Gaasbeek (Tenor), 7.0 (from Basle), Le Malade Imaginaire—Play (Molière), 8.20 (approx.), Weather and News, 8.30 (approx.), Part Relay of the European Concert from Budapest, 9.20 (approx.), Popular Hungarian Music, 10.0 (approx.), Close Down.

SOTTENS.—See Radio-Suisse Romande.

STOCKHOLM

689 kc/s, 436 metres; 55 kW.—Relayed by Boden, 244 kc/s, 1,229.5 metres; Göteborg, 932 kc/s, 322 metres; Hörby, 1,166 kc/s, 257 metres; Motala, 222.5 kc/s, 1,348 metres; Östersund, 389 kc/s, 770 metres; and Sundsvall, 554 kc/s, 542 metres.—3.0 p.m., Technical Talk, 3.20, Light Music by the Ilerman Martenssoa Ensemble: Overture, The

Nurenberg Doll (Adam); Selection from Fedora (Giordano); Flirtation (Steck); Polichinelle (Kachumanirov); Canzonetta (Wappler); Selection from The Bayadere (Kälman), 4.5 (from Östersund), Programme for Children, 4.30, Gramophone Music, 5.30, Radio Report, 5.45, A Dialogue, 6.15, Weather and News, 6.30, Military Band Concert, conducted by Joel Olsson, relayed from Falun, 977 kc/s, 307 metres, 7.30, Cabaret Programme, 8.15, Old Dance Music, 8.45, Weather and News, 9.0, Modern Dance Music, 10.0 (approx.), Close Down.

STRASBOURG

869 kc/s, 345 metres; 11.5 kW.—11.30 a.m., Gramophone Music, Eine kleine Nachtmusik (Mozart), The Pathetic Sonata (Beethoven); Berceuse (Lyon); Wiegengied (Schubert); Selection from Hansel and Gretel (Humperdinck); Prelude, Fugue and Sicilienne from Pelléas et Mélisande (Fauré); Pavane pour une Infante défunte (Ravel); Pastorale from L'Arlésienne (Bizet), 12.45 p.m., News, 1.0, Time 1.1, Concert of Variety Music, conducted by Roskam, March (Bergmann); Overture, Im Reiche des Indra (Lincke); Foxtrot (Heymann); Cello Solo: Mon cœur soupire (Mozart); There's a Ring around the Moon (Lewis Goodheart and Nelson); Toujours on jamais (Waldteufel); Selection from The Daughter of the Regiment (Donizetti); Joey, the Clown (Reaves and Meyers); Serenade (Lincke); Dixie Night (Repper); March, The Gladiator's Farewell (Blakenburg), 2.0, Legal Talk in German, 2.15, Gramophone Concert, 3.0, Talk on Music: Debussy, 3.15, Interval, 4.0, Gramophone Concert, 5.0, Pasdieu Concert, relayed from Paris, 7.0, French Lesson, 7.15, Horticultural Talk in German, 7.30, Time and News, 7.45, Gramophone Music, 8.0, Press Review in German, Lottery Results and Announcements, 8.30, Un Soir de Réveillon—Sound Film, 10.25 (approx.), Press Review, 10.30, Orchestral Concert, conducted by Jamine, relayed from the Grand Kléber Tavern, March, Per Aspera ad Astra (Urbach); Waltz, Roses from the South (Joh. Strauss); Baby Parade (Manfred); Overture, Raymond (Thomas); In the Mystic Land of Egypt (Ketybel); Overture, Les Cloches de Cornville (Plauquette); Selection from Tieland (d'Albert); Selection from Il est charmant (Moretti); Vibraphone Solo: March, Coliseum (Kalkman), 11.30 (approx.), Close Down.

STUTTGART

MUHLACKER, 832 kc/s, 360.5 metres; 60 kW.—Relayed by Freiburg, 527 kc/s, 570 metres.—12.25 p.m., Local News and Weather, 12.35 to 2.15, See Frankfurt, 2.15, Learn Morse! 2.30, Concert by the Otto Schulzabe Balalaika Orchestra: Folk Melody, Neue Bretzeln; The Red Sarafan (Varlamov); Pot-pourri No. 4 (Schulzabe); Two Russian Folk Melodies; Swabian Polka from the Ukraine, 3.0, Concert by the Station Orchestra, conducted by Otto Seyffert: Overture, Gipsy Love (Lehár); Spanish Waltz (Translatiere); Habanera (Chabrier); Catalan Rhapsody (Ailbott); Le pas des fleurs (Delibes); Foxtrot (Pillney); Modern Dance Music, 5.0 to 5.25, See Frankfurt, 5.35, Sketches (Russwurm), 5.50, Time, Market Prices, and Weather, 6.0, Transmission for all German Stations, relayed from Langenberg, 7.0, See Frankfurt, 7.10, Langenberg, Stuttgart, Frankfurt Exchange Programme—with 500 kW.—Bunted Abend, 9.0, See Frankfurt, 9.20, Topical Talk, 9.30, Local News and Sports Notes, 10.0, Variety Programme, relayed from the Universum, 11.0, Serenade, 1.0 a.m. (Sunday), Close Down.

SUNDSVALL.—See Stockholm.

TOULOUSE

779 kc/s, 385 metres; 8 kW.—6.0 p.m., News, 6.15, Military Music, 6.30, Chansonettes, 6.45, Music by an Argentine Orchestra, 7.0, Light Music, 7.15, News, 7.30, Songs from Sound Films, 7.45, Mascarade (Lacôme), by the Symphony Orchestra, 8.0, Light Music, 8.15, Opera Music by the Station Orchestra: Ballet Music from Hamlet (Thomas); Prelude and Scene from Orpheus (Gluck); Selection from Hans the Flute Player (Ganne), 8.30, Accordion Solos, 8.45, Orchestral Music, 9.0, Concert Version of Enlevé-moi—Operetta (Gaboroche), 9.30 (approx.), Military Music, 9.45 (approx.), Opera Music: Arias from: (a) The Magic Flute (Mozart), (b) Pénélope (Fauré), (c) La Favorita (Donizetti), 10.0, Music by a Viennese Orchestra: Lehar Potpourri; L'étoile polaire (Waldteufel); Brise argentine (Daquin); Weaner Madin (Ziehrer), 10.15, North African News, 10.30, Concert for Listeners in Morocco, 11.0, Request Music: Selection from La Traviata (Verdi); Avoir un bon copain (Heymann); Overture, Carmen (Bizet); Tango, 11.15, Dance Music, 12 Midnight, News, 12.5 a.m. (Sunday), Opéra-Comique Music: Airs from: (a) I Pagliacci (Leoncavallo), (b) Fortunio (Messager), (c) La Vivandière (Godart), (d) Le Caid (Thomas), 12.15, Orchestral Music: Invitation to the Dance (Weber); Academic Festival Overture (Brahms), 12.30 (approx.), Close Down.

TRIESTE

1,211 kc/s, 247.7 metres; 10 kW.—4.10 p.m., till Close Down, See Turin.

TRONDHEIM.—See Oslo.

TURIN

1,096 kc/s, 273.7 metres; 7 kW.—Relayed by Milan, 905 kc/s, 331.5 metres; Genoa, 959 kc/s, 312.8 metres; and Florence, 599 kc/s, 500.8 metres.—4.10 p.m., Chamber Music: Toccata (Debussy); Clair de lune (Debussy); Ave Maria (Schubert); Kol Nidrei (Bruch); Two Pieces for Harp (Tedeschi); Capriccio No. 13 (Paganini); Concerto Grosso (Molinari), 5.0 to 5.5, Weather, 5.40, Giornale Radio, Lottery Results, Dopplavoro Notes and Gramophone Music, 6.0, Time, Tourist Talk and Gramophone Music, 6.10, Agricultural Report, 6.20, News in Foreign Languages, 6.40, Gramophone Music, 7.0, News, 7.25, Talk: Events and Problems, 7.45, See Rome, 8.0, Programme to be announced. In the intervals, Book Review, Notes and Giornale Radio.

VATICAN CITY

15,120 kc/s, 19.84 metres (Morning), and 5,969 kc/s, 50.26 metres (Evening); 10 kW.—10.0 to 10.15 a.m., Religious Announcements in Various Languages, 7.0 to 7.15 p.m., Religious Information in Italian.

VIENNA

581 kc/s, 517 metres; 100 kW.—Relayed by Graz, 852 kc/s, 352.1 metres; Innsbruck, 1,058 kc/s, 283 metres; Klagenfurt, 662 kc/s, 453.2 metres; Linz, 1,220 kc/s, 245.9 metres; and Salzburg, 1,373 kc/s, 218.5 metres.—11.0 a.m., Concert by the Volkoper Orchestra, conducted by Philipp de la Cerda: Overture, The Maid of Orleans (Verdi); Selection from (a) Il Tabarro (Puccini), (b) Suor Angelica (Puccini), (c) Gianni Schicchi (Puccini); Intermezzo from I quattro Rusteghi (Wolf-Ferrari); Two Spanish Dances (Falla); Waltz from Die Göttergattin (Lehar); Two Pieces from Das Schwalbennest (Granich-standten); Overture to a Marionette Play (Weinberger); Selection from Der Rosenkavalier (R. Strauss); Selection from Der Teufelsreiter (Kalkman); Austrian Song, An der blauen Donau, da steht ein kleines Haus (Cerde); Kaiserjäger-Marsch (Mühlberger-Depolo). In an interval at 12 Noon, Time and News, 1.0, Interval, 2.0, Time and Announcements, 2.15, French Conversation Lesson, 3.40, Choral Concert, conducted by Erwin Markus; Requiem (Cornelius); Two Songs (Schubert): (a) An die Sonne, (b) Chorus from Rosamunde; Three Old German Love Songs (Wohnwurm): (a) Ich weiss ein schönes Rüslein, (b) Sei, gottwillkomm, Frau Nachtigall, (c) Mein Lieb ist wie der Morgenstern; Zigeunerlied (Schumann), 3.20, Talk: The Railway in Humour and Satire, 3.45, Talk for the Thirtieth Anniversary of Mommsen's Death, 4.15, Gramophone Concert of Classical Music, 5.15, Topical Talk, 5.45, Time and Announcements, 5.55, Reading (Albert von Trentini), 6.35, Concert of Light Music by the Wiener Symphoniker, conducted by Josef Holzner, 7.25, To-day's Motto, 7.30, European Concert, relayed from Budapest, 9.15, News, 9.30, Cigány Music, relayed from Budapest. After the Programme, Announcements.

WARSAW

212.5 kc/s, 1,411 metres; 120 kW.—10.57 a.m., Time Signal and Chimes from St. Mary's Church, Cracow, 11.5, Orchestral Concert, relayed from Lwów, 11.30, Radio Journal, 11.35, Weather, 11.38, Concert (contd.), 12 Noon, Interval, 2.30 p.m., Talk on Economics, 2.40, Answers to Correspondence, 2.55, Aviation Report and Anti Gas Drill, 3.0, Gramophone Music, 3.20, Talk: Modern Poland, 3.40, French Lesson, 3.55, Concert by the Station Orchestra, conducted by Oziminsky, Soloist: Poplawsky (Tenor), Overture, The Thieving Magpie (Rossini); Selection from La Bohème (Puccini); Songs: (a) Aria from Ilanón (Mascnet), (b) Aria from Eugene Onegin (Tchaikovsky), (c) L'oiseau du paradis (Rozycycki); Overture, Mignon (Thomas); Songs: (a) Cracovienne (Giewiadowsky) (b) Waltz (Jarczyewsky); Nipsy Dance (Saint-Saëns), 4.45, Programme for Invalids, relayed from Lwów, 5.0, Divine Service from Wilno, 6.5, Miscellaneous Announcements, 6.25, Reading, 6.40, Programme Announcements, 6.45, Radio Journal, 7.0, Answers to Technical Correspondence, 7.15, Gramophone Music, 7.30, Part Relay of a Concert from Budapest, 8.30, Chopin Pianoforte Recital by Mme. Jaroszewicz, Two Etudes from Op. 25, No. 1, in A, and No. 2, in A Flat; Nocturne in C Sharp Minor, Op. 27; Mazurka in F Sharp Minor, Op. 6; Ballad in A Flat, 9.10, Talk in English: The Fifteenth Anniversary of the Polish Republic, 9.25, Sports Notes, 9.35, Cigány Music, relayed from Budapest, 10.0, News, Weather and Police Notes, 10.5, Gramophone Dance Music.

WILNO

608 kc/s, 493.4 metres; 16 kW.—6.40 p.m., Programme Announcements, 6.45, See Warsaw, 9.10, Talk, 9.25, See Warsaw, 9.35, Concert from Budapest, 10.0, See Warsaw.

ZAGREB

977 kc/s, 307 metres; 0.75 kW.—7.0 p.m., Educational Notes, 7.30, European Concert, relayed from Budapest, 9.10, News, 9.25, Dance Music, 10.0 (approx.), Close Down.

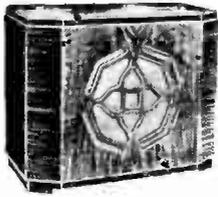
ZURICH.—See Schweizerischer Landessender.

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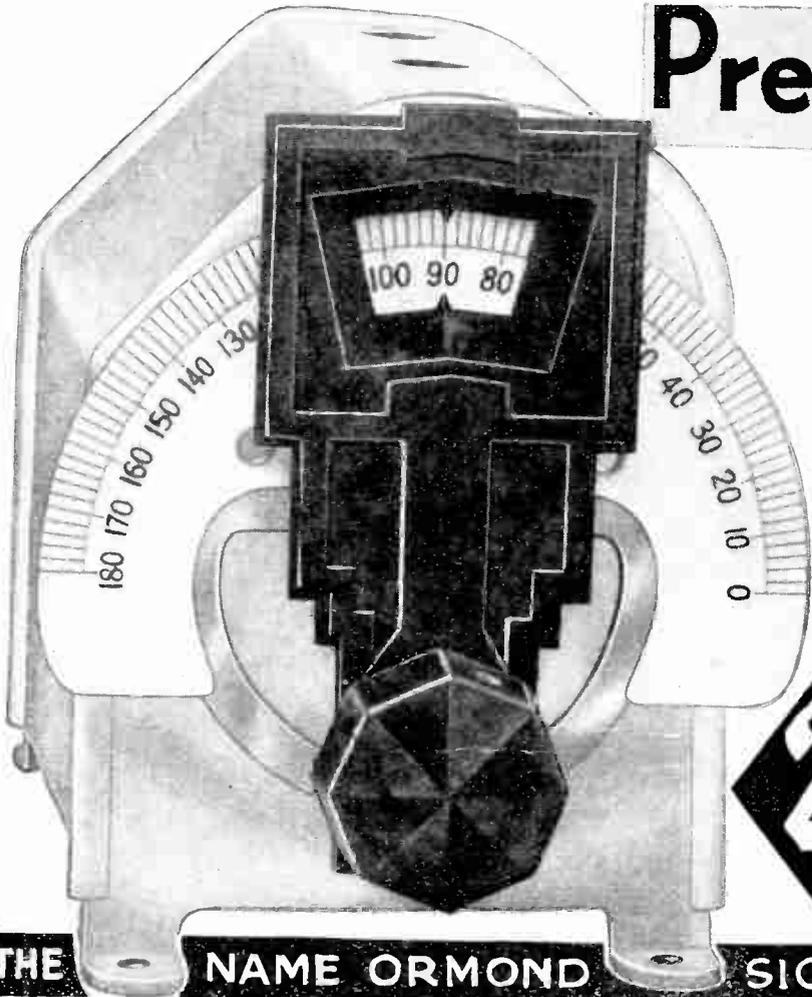
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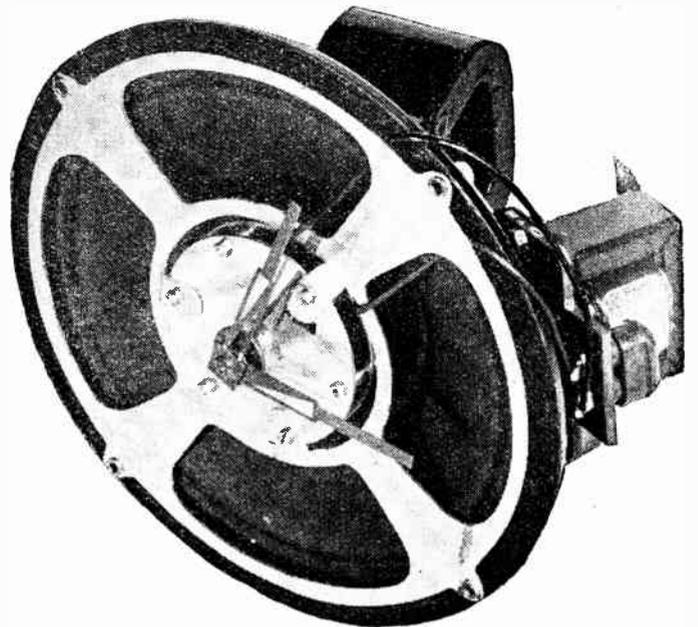
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# BROADCAST BREVITIES

By Our Special Correspondent

## "House of Mystery" Broadcast To-morrow

IF the first vaudeville programme from the St. George's Hall studio to-morrow night (Saturday) sounds thin and sepulchral, do not put this down to the natural "spookiness" of the place; the hollow sound will be due partly to the fact that on this occasion there will be no audience.

The engineers are now experimenting with the acoustics of the hall, and already the stage has been somewhat extended to bring the performers outside the proscenium arch.

## Studio Audiences of 600

In the fullness of time select audiences will be admitted to St. George's Hall just as they now attend vaudeville performances at Broadcasting House and "No. 10," but there will, of course, be no question of payment as the B.B.C. is not taking out a licence as in the case of the Concert Hall at headquarters.

St. George's Hall will comfortably contain at least 600 persons, so at this rate the B.B.C. should soon cut down the length of that waiting list.

Now is the time to apply for admission.

## A Secret

Meantime, it is said that the B.B.C. chiefs are gazing longingly at the Queen's Hall itself! But perhaps on this point I had better say no more at the moment.

## Filming Broadcasting House

MR. JOHN GRIERSON, the film producer, has wisely (I think) decided to omit the love element in his film of Broadcasting House, the scenario of which is now nearly ready. So certain writers who have tried to liken the new film to "Grand Hotel" are, in some respects, off the track.

## "Grand Hotel"

The only real point of resemblance will be in the scenes of that impressive entrance hall with its ceaseless flow of visitors. But there again, if I remember rightly, nearly all the callers at Grand Hotel secured admission, but as anyone who has waited in the vestibule at Broadcasting House knows, not a few visitors there are turned empty away. Which, from the listener's point of view, is a good thing.

In this connection I sometimes think that those who condemn the B.B.C. programmes might soften their tone if they knew how many turns are not broadcast.

## The Power of Droitwich

AS exclusively stated in these columns in the issue of September 28th last, the new Droitwich transmitter, it is now officially announced, will employ a power far in excess of the nominal 100 kW. Actually 150 kW will be employed in the aerial, although, as I have already said, it will be possible to secure an output of 200 kW.

## Scrapping the Nationals

It is common knowledge, of course, that the opening of Droitwich will see the end of the London, West and North National stations. Because West and London National are already sharing a wavelength, this will mean that the closure of the three

Nationals releases two wavelengths, one of which will be allotted to the new North Eastern station at Newcastle and the other to the North Scottish at Culloden.

The scheme may look all right on paper, but I may, like a writer in *The Daily Telegraph*, "be permitted to entertain a doubt."

## Doubtful Advantages

All along the South Coast listeners are even now complaining of poor reception of the National transmissions. Complaints are strongest in Kent, where people rely on the London National transmitter. Is it to be expected that they will secure happier results when restricted for their National programmes to the Droitwich transmitter?

Maybe, or maybe not.

## High Power at the New Northern Stations

I hear that work on the new transmitters will be begun before the autumn of next year, when Droitwich enters into regular service, so that Scotland and the North generally may expect the new era of powerful reception by midsummer, 1935. Both North Eastern and North Scottish will have an aerial power of not less than 75 kW.

## Their's But to Do or Die

THE spirit of the Inquisition is afoot in Broadcasting House. From personal friends among the staff, I learn that the utmost surprise has been occasioned by the circulation of a form requiring them to give a more or less complete record of their careers since leaving school.

What is the motive behind this?

## And Across the Channel

Contact with wireless seems to stimulate this inquisitorial habit. A Paris friend tells me of the dissatisfaction among French listeners at the number of questions which have to be answered before a listener can secure the now necessary wireless licence.

## Desperate Case

The other day a prospective French licensee, goaded to desperation, sent his local postmaster an application for a licence together with the following information: "I was born on the 31st July, 1899, at ——. I married my wife, who is a blonde, on the 30th September, 1920. Of my six children, the three first have had measles. My grandparents are dead, likewise my father, but my mother survives. My father-in-law was a Brussels sprouts merchant. I trust these particulars will be helpful in the collection of the radio tax."

## Off to Canada

WITHIN a fortnight's time Mr. Malcolm Frost will start off for Canada to blaze the trail of Empire broadcasting over there. He will take with him copies of the eleven records which he has already successfully disposed of in South Africa, Australia, and other parts of the Empire.

## More Canned Programmes

On his return from Canada, Mr. Frost will, I understand superintend the production of more records. These "canned" programmes, representative of the best types of B.B.C. transmission and ranging from radio drama to vaudeville, have infused new blood into the Empire and Colonial programmes, and have actually helped to raise the standard of local production.

## More "America Calling"

AS in the case of his previous effort, Eddie Pola's projected programme for November 16th and 17th, "America Calling Again," is a burlesque on American broadcasting. Dave Burns will impersonate Jack Pearl as "Baron Munchausen," America's foremost Dutch dialect comedian who created the expression, "Vass you dare, Sharlie?"

Other artistes who will be impersonated are Al Jolson, The Mills Brothers, and Bing Crosby. The Mills Brothers will be impersonated by the Moderniques and Bing Crosby by Al Bowley. Eddie Pola will again appear as the announcer.

## Anyway, It Got There

A READER writes: "When Mr. Martin Hussingtree wrote 'The Wrong 'Bus,' the little thriller which the B.B.C. broadcast the other evening, did he intend that the omnibus should be gearless? Either the 'Effects' 'bus had no gears, or it made a marvellous getaway on top."

How do I know what was in Mr. Hussingtree's mind?



DISTINGUISHED VISITORS. "Radio City," New York, was recently visited by Marchese Marconi. This photograph, taken on the roof of the Rockefeller Building, shows (left to right): Mr. M. H. Aylesworth, President of the N.B.C., Mr. Hugh S. Robertson, Marchesa and Marchese Marconi, Mr. David Sarnoff, President of the R.C.A., and Col. Arthur Woods, President of the Rockefeller Centre.

# UNBIASED

## BY FREE GRID

### Droll Remark

IN a recent case in America in which the finances of a small wireless firm were being investigated, it was stated by counsel that the company in question had been able to keep afloat in spite of a devastating fire which had occurred at the works.

We are accustomed to judicial humour, but, at the same time, I thought that it was in rather bad taste for the judge to suggest that learned counsel had been guilty of a slip of the tongue by using the words "in spite of" instead of "owing to."

### Epoch-Making

SUCH remarkable progress has been made in radio-technique during the past few years that I hesitate to draw attention to any particular discovery and to apply the hackneyed but exceedingly expressive term "epoch-making" to it. However, common justice to an inventor demands that I must.

The discovery, which is truly breathtaking in its very audacity, is reported in one of the more progressive of our great newspapers, and is to the effect that a citizen of the no mean city in which this particular journal circulates made the remarkable discovery that a loud speaker could be "worked with a signal current passed through a human body." In other



Tears rolling down my bib.

words, by disconnecting one terminal of the loud speaker and grasping it with one hand and the wire with the other, signals could still be heard; and, just to show that there was no deception, this miracle was demonstrated to a reporter of the paper concerned.

Now, I have to confess that when I first read this account I nearly did a grave injustice to the inventor, for I erroneously thought that I had read something like it years before; indeed, I had a distinct recollection of the tears rolling down my bib when I first saw the stunt performed by my mother. But I was wrong, and humbly apologise for it.

My mother, ardent experimenter that she was, merely did it by clutching at *one* wire, but she has been left far behind, for, although it is admitted that it has been done previously with one wire, the epoch-making discovery has been made that it can still be done even if a number of wires are grasped in the hand.

### My Distinguished Reader

JUDGES are notoriously conservative in their outlook, and are apt to look upon all the great discoveries of science with the codfish eye of suspicion, as witness their repeated and plaintive demands: "What is a double-diode-triode?"

It is quite evident, however, from recent evidence which has come to light that this attitude of mind is fast waning, and that judges are beginning to "take cognisance" of things outside their immediate ken, even to the extent of reading the few humble words which I pen every week in *The Wireless World*. The case in question was one in which a gentleman was accused by the police of breaking into a place of entertainment and rifling the safe, the sole evidence for this outrageous charge being that the police happened to discover a finger print which corresponded with that of the gentleman. The police alleged that the chances were four *billion* to one against anybody else possessing a similar finger print, and, since there were not four billion people in the world, they regarded the case as proved.

His Lordship, however, mindful of the great finger-print controversy which raged in my column twelve months ago, thought otherwise, and said so in no uncertain terms in his summing-up, with the result that the gentleman was found guiltless and discharged.

It is truly astonishing and, indeed, somewhat terrifying to think that, had not the judge read the irrefutable evidence which appeared in *The Wireless World* last year to the effect that finger prints can be forged, a fellow-man would even at this moment have been enduring all the discomforts of sleeping without a mattress, which I can assure you from personal experience is no light matter.

### Stock Replies

THERE are many queer ways in which ardent collectors indulge in their passion, and I suppose that the postage stamp malady is really the most common of them all.

But the most curious of all the collecting hobbies is that indulged in by a sturdy Lancastrian who was my stable companion when journeying down from Manchester to London the other day. Our conversation had passed naturally and easily from horse-racing to radio, and this led directly

to my friend telling me of his particular collecting mania, which was to acquire a complete set of the innumerable stock letters which the B.B.C. send out to all their correspondents. The Corporation has, so he alleged, a stock reply to suit every conceivable question under the sun, and it is his one ambition in life to frame a letter in such a manner that none of the stock replies will do, and a special letter will become necessary. So far, however, he has been baffled in all his efforts, with the result that he now has several trunk-loads of stock letters which, according to a direction in his will, shall pass to the nation on his demise. But he still has hopes of fulfilling his ambition to drag a special letter out of Portland Place before he passes finally into the hands of the mortician.



So far he has been baffled.

He has so fired my imagination that I am even tempted to have a go at the game myself. It must be far more exciting than collecting bookmakers' demand notes or publishers' "rejection slips," in which so many people wantonly indulge nowadays.

At present the gem of my companion's collection is a stock letter sent from Savoy Hill many years ago, and signed by my old friend Captain Eckersley at a time when he and I were in America together.

### When Ignorance is . . .

I SEE that a well-known scribe is urging his readers to take up the B.B.C.'s new German course on the grounds that the knowledge so obtained would be "particularly valuable in touring the Continent."

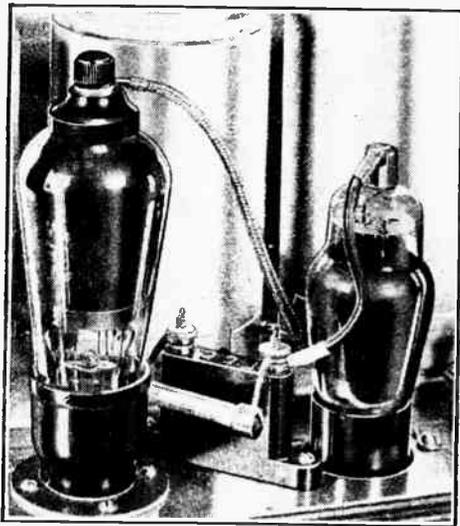
Speaking from a fairly wide experience of touring the Continent, I must say that, more often than not, a *lack* of linguistic knowledge has often been even more valuable to me. In particular, I have found, when travelling in a German Schnellzug without the necessary supplement, that a wooden expression and a bland "ignorance" on my part of any other language than Sanskrit has often reduced the ticket inspector to a nervous wreck and enabled me to get away with it, while others similarly situated but foolish enough to trot out a few halting phrases learned from the B.B.C. have been badly stung.

# Further Notes on the New Monodial Super

## The Alterations Needed for the British Heptode

**W**HEN the New Monodial Super was described in *The Wireless World* the only Pentagrid valve available was of American origin, and it was employed owing to the undoubted advantages of this type of valve over the only alternative—the conventional two-valve circuit. A British equivalent, the Ferranti VHT<sub>4</sub> Heptode, however, is now made, and many requests have been received from constructors for an indication as to its suitability. Tests have been carried out with many different specimens, therefore, and it may be said at once that it has been found to be an entirely satisfactory alternative to the 2A7.

Fortunately, the valve is designed to operate with the same applied voltages, except on the heater, which follows the standard British rating of one ampere at 4 volts, so that changes in the anode and screen supplies are unnecessary. The only alterations from the original specification which are required in order to use the new valve, therefore, are the omission of the 2-ohms heater resistance (R<sub>3</sub> on the original circuit diagram) and the replacement of the American valveholder by a 7-pin British type. If the Clix chassis mounting type be used, no change is needed in the size of the hole in the chassis.



The 2A7 valve originally used in the New Monodial Super is shown here. The employment of the Heptode involves little alteration.

The control grid of the tetrode portion of the valve is connected to the terminal on the top of the bulb, as in the American type, but the connections to the valveholder are arranged differently. In order to avoid any chance of error, therefore, a practical wiring diagram of the

By  
W. T. COCKING

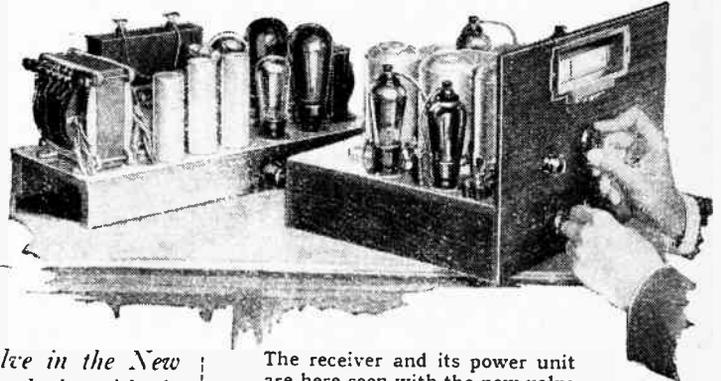
*THE use of a British frequency-changer valve in the New Monodial Super is dealt with in this article, together with questions arising through the use of a different output stage. Indications as to testing procedure are also given.*

appropriate portion of the receiver is included with this article. The performance of the receiver with the British valve is in no way different from that with the 2A7, and the instructions for ganging and operating the set which were given in the constructional articles still hold good, and without any amendment. It is felt, however, that some further general notes may prove helpful.

### Alternative Output Stage

Many builders are desirous of using the new receiver chassis in conjunction with the 2½ watts or 5 watts power chassis of the original Monodial. So far as voltages and currents are concerned this is permissible, and no alteration is necessary either to the receiver or the power chassis. In order to maintain the correct loading on the low-pass filter, however, a 10,000 ohms 1 watt resistance should be connected across the L.F. transformer primary. As the output stage with one of these older power units is not of the push-pull type, the possibilities of L.F. feed-back are increased, and there is some risk of motor-boating. It is a wise plan, therefore, to increase the capacity of the second detector anode circuit decoupling condenser (C<sub>21</sub> to 8μF; if an electrolytic condenser be used, ample space for mounting it on the chassis is available.

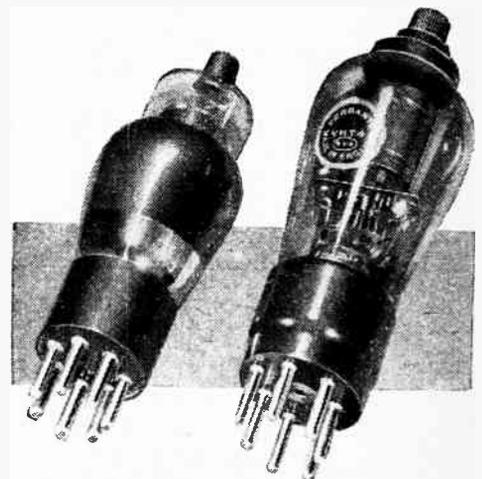
Should motor-boating occur when using the push-pull output stage it will be evident that it is a sign of an unusual amount of L.F. feed-back. It is, therefore, indicative that one of the output valves has become defective, and that the output stage is no longer correctly balanced. Some care in diagnosing the cause of the trouble should be taken, however, since an audible effect very similar to motor-boating, and thus likely to be mistaken for it, can occur through a very different cause.



The receiver and its power unit are here seen with the new valve in situation

Should H.F. or I.F. instability be present in any receiver fitted with A.V.C. the audible effect is almost indistinguishable from motor-boating. This is readily understandable when it is remembered that self-oscillation leads to a large detector input, and this in turn means a large bias on the controlled valves. As a result, these stages stop oscillating, the detector input drops, and the bias returns to its normal value, when instability once more sets in and the whole cycle is repeated.

Instability in a receiver such as the New Monodial, of course, is an unlikely event, but it may be useful to indicate the danger points which may be found not only in this set, but in any superheterodyne. The first is the gang condenser, for it is essential



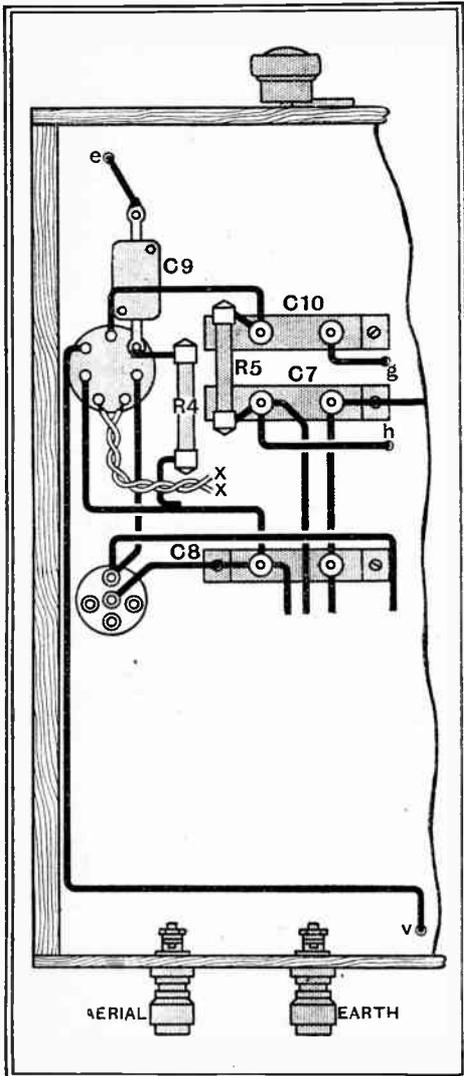
The 2A7 valve is shown on the left and the VHT<sub>4</sub> on the right; the different arrangement of the pins can clearly be seen.

that the frame of this component be earthed at each end. If it is not, the single earth connection will act as a common coupling to the signal frequency circuits, and instability, poor ganging, and a low degree of preselection will be found. The second danger point is the anode circuit of the frequency changer, for this lead must not be allowed to pass close to the H.F. valve or any of its grid circuit components. A spacing of at least two inches

Further Notes on the New Monodial Super—  
between the anode lead and the H.F. valve  
circuits must be allowed.

### Testing and the A.V.C. System

Apart from such obvious errors as poor connections, no troubles are likely other than through the unfortunate event of one of the components proving defective. Should this occur its tracing may be hampered by the A.V.C. system, so that it is



The practical wiring diagram of the frequency changer portion of the set embodying the British valve.

a great help to be able to cut this out of circuit. This may readily be done by short-circuiting C15, and by placing the local-distance switch at local the noise suppressor resistance R0 may be used as a manual sensitivity control. The receiver then functions without A.V.C., and its performance may more easily be judged by those unaccustomed to handling a set fitted with automatic volume control.

A specimen receiver, with the necessary alterations from the original model for the inclusion of the Ferranti VHT4 Heptode, is available for inspection at 116, Fleet Street, London, E.C.4.

## Interference

### Progress of I.E.E. Committee's Investigation

The Committee on Electrical Interference with Broadcasting set up by the Institution of Electrical Engineers held its second meeting on Thursday, October 5th. This Committee, it will be remembered, was set up as a direct result of the recommendation put forward by "The Wireless World" in November last, that the I.E.E. was the proper body to undertake the task, as being truly representative of the electrical industry of this country.

SINCE the last meeting of the Main Committee, four sub-committees, we are informed, have been engaged on the consideration of means which might be adopted and the cost of such means to render future plant and appliances non-interfering. Consideration has also been given to possible methods for dealing with interference apart from suppression at the source.

The report of the sub-committees was considered in detail and accepted. The investigations have included such items as lifts, trolley omnibuses, domestic appliances, and other apparatus.

The work of the sub-committees indicates that devices for the suppression of interference from many items of electrical plant, particularly domestic appliances, could be incorporated in future designs at a reasonable cost. Further investigation is necessary on some of the larger items of plant, and tests of a quantitative nature are being carried out by the British Electrical and Allied Industries Research Association on such items.

The Committee reviewed various possibilities of bringing suppression devices into general use without having recourse to legislation.

It was emphasised that for the suppression of much of the electrical interference which exists at present, goodwill and co-operation will be necessary among a large number of interests.

Pending the result of the further investigations which are now being carried out, it was agreed that co-operation should be sought with the manufacturers and other interests affected on the basis of the interim report of the sub-committees, and efforts are being centred in this direction. Consideration was also given to the possibility of international action on the question of electrical equipment embodying suppression devices, and arrangements were made for a British National Committee to be set up to consider this question.

## The Radio Industry

A USEFUL little accessory for use with Henley's Solon soldering-iron has just been introduced. Known as the Solon Solder Pot, it is intended for clamping on the body of the iron, where it will maintain a sufficient quantity of solder in a molten state for tinning the ends of wires, etc. It costs one shilling.

Mr. R. J. Durand, late of the B.B.C., who was in charge of the reproducing equipment at the Olympia, Manchester, and Glasgow exhibitions, has now joined the City Accumulator Company. He is to take charge of the C.A.C. showrooms at 4, Surrey Street, Strand, London, W.C.2.

Philips are now marketing a loud speaker and a pick-up; the former is of the permanent magnet type and is supplied with suitable transformers for pentode, triode, Class "B" and Q.P.P. output valves.

A newly formed company, the Marine Electrical Equipment Co., Ltd., Gambrell Works, Merton Road, Southfields, London, S.W.18, is producing a series of radio-telegraphic and telephonic transmitters for commercial service. The apparatus, which is fully described in a booklet just received, includes complete ship

sets, and also low-powered radio-telephone installations for fishing craft and yachts, as well as direction finders and lifeboat equipment.

It is significant that the firm of E. K. Cole, Ltd., which has always concentrated on mains-operated-receivers, are now producing a battery-operated version of their well-known seven-stage superheterodyne. Recent technical improvements in battery-fed output stages are responsible for this change of policy.

Ferranti's announce the introduction of a new superheterodyne—the Lancaster Magna at 15 guineas. The smaller original model is now known as the Lancaster Parva, and costs 13½ guineas.

### Change of Address

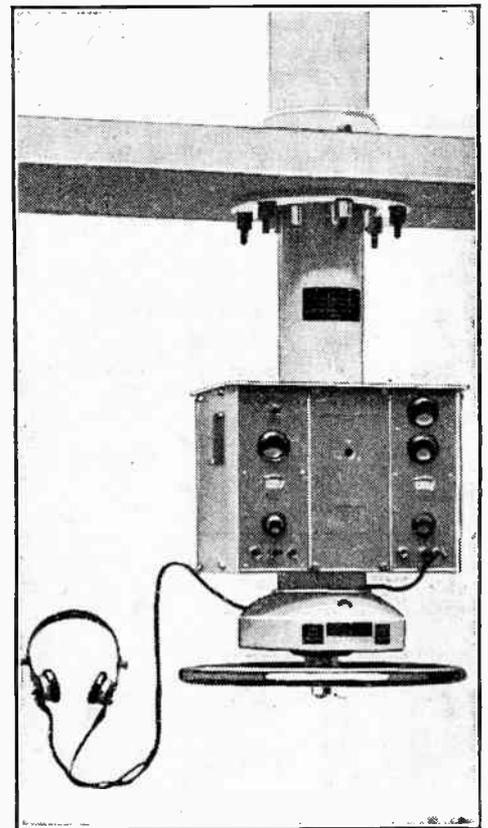
Mavox Radio, Ltd., from 17, Maddox Street, London, W.1, to 21, Store Street, Tottenham Court Road, London, W.1. (Museum 9228.)

### Catalogues Received

British Insulated Cables, Ltd., Prescott, Lancs.—B.1 wireless condensers.

S. Smith and Sons (M.A.), Ltd., Cricklewood, London, N.W.2.—"Anodex" dry batteries.

Siemens Electric Lamps and Supplies, Ltd., 38-39, Upper Thames Street, London, E.C.4.—"Full-o-Power" radio batteries.



The Marine Electrical Equipment Company's direction finder, with receiver unit mounted on the column supporting the rotating loop.

Wilkins and Wright, Ltd., Holyhead Road, Birmingham.—"Utility" condensers and other wireless components.

British Ebonite Co., Ltd., Hanwell, London, W.7.—Price list of ebonite panels, rods, tubes, etc.; also "Handbook of Tuning Coils," with illustrations and winding data.

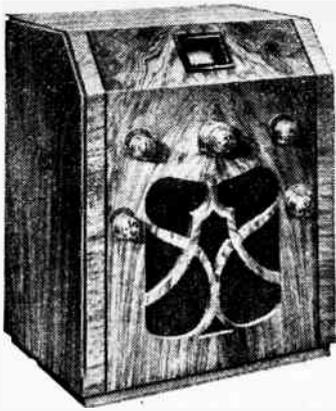
Amplion (1932), Ltd., 82-84, Rosoman Street, Rosebery Avenue, London, E.C.1.—Amplion loud speakers and components.

Trevor Pepper, 48, Wake Green Road, Moseley, Birmingham.—"Seradex" eliminators, battery chargers and rectifiers.

Chas. A. Osborn, 21, Essex Road, Islington, London, N.1.—Radio cabinets.

Webb Condenser Co., Ltd., 42, Hatton Garden, London, E.C.1.—Variable condensers and components.

# Telsen "464" Receiver



**FEATURES.** *Type.*—Table model A.C. mains receiver for use on outdoor or mains aerial. *Circuit.*—H.F. pentode stage with iron-cored tuning coils—grid detector with reaction—power pentode. Full-wave valve rectifier. *Controls.*—(1) Main tuning (with trimmer). (2) Wave-range. (3) Reaction. (4) Selectivity control. (5) Tone control. *Price.*—9 guineas. *Makers.*—Telsen Electric Co., Ltd., Aston, Birmingham.

## A Well-finished Receiver at a Low Price

ONE of the first things to attract attention in view of the very reasonable price of this receiver is the exceptionally good finish and clean workmanship. From this point of view it will bear the closest examination not only in the cabinet work, but in every detail of the chassis.

The bright-finished steel framework of the chassis is proportioned to give a neat and compact layout, and is unusually rigid, the edges of the metal having been turned up for strength in the bending process. The chassis is held in position in the cabinet by rubber-bushed screws in the base, and is pulled up to the front panel by additional bushed screws passing through extensions of the side members. A rubber ring makes an effective seal between the periphery of the moving-coil loud speaker and the cabinet.

The loud speaker is of slightly larger dimensions than usual, and the sound output, both from the point of view of volume and quality, would do credit to a set of far higher price. A tone control is fitted, and with this set towards the "high" position the reproduction is clear and crisp. There is very little background noise or mains hum, and this undoubtedly adds to the effect of realism.

A "straight" three-valve circuit has been adopted, and the H.F. stage includes iron-cored coils and one of the latest H.F. pentode valves. An all-metal "Catkin" valve is used in the detector stage, and is followed

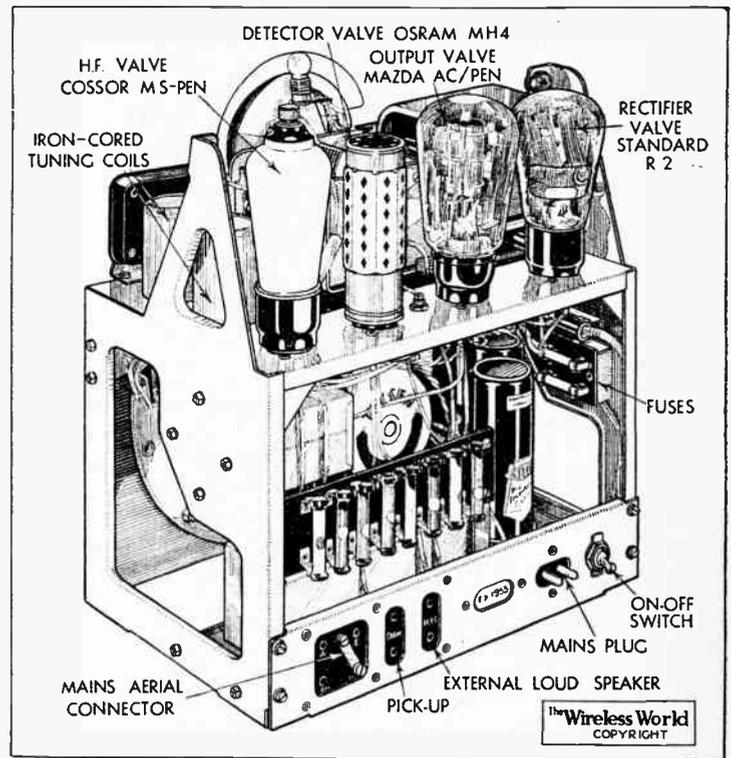
by a power pentode output valve. The rectifier is a full-wave standard valve of the "Micro-mesh" type.

There are two tuned circuits, and the ganged tuning condenser is provided with an auxiliary trimmer controlled by a spindle passing through the main control knob. Both tuned circuits are arranged as loosely-coupled transformers, and reaction is applied to the intervalve circuit from the detector. To assist selectivity, a series variable condenser is connected in the aerial lead. This is automatically short-circuited in the maximum position in order that the full sensitivity of the set may be available under conditions which do not call for a higher degree of selectivity.

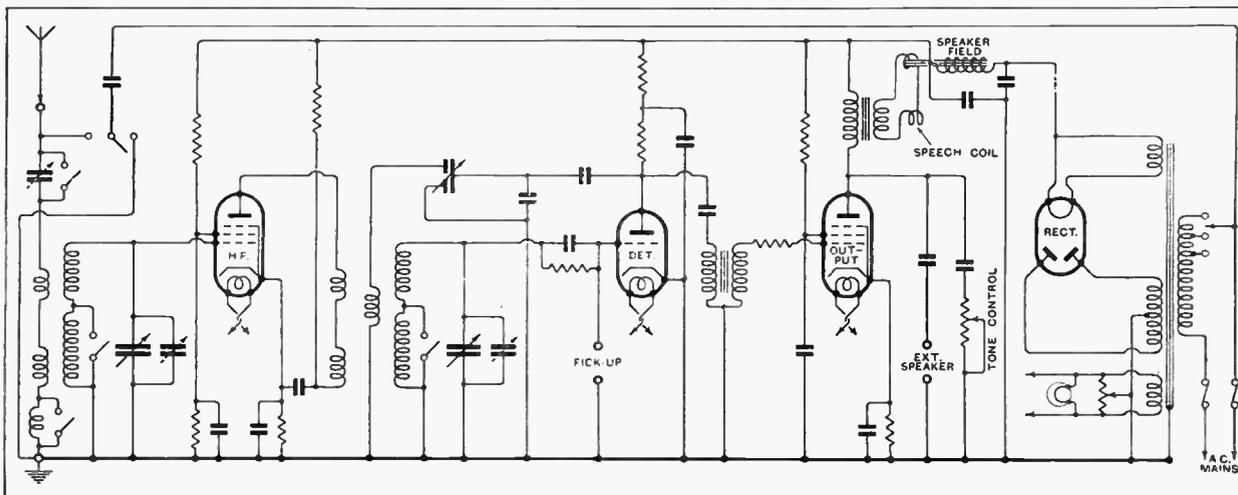
We were particularly impressed by the

sensitivity, and for a set of its type the range is definitely above the average. Many of the medium-wave stations, such as Brussels, Langenberg, and Fécamp, came through in daylight with as much volume as many three-valve sets give under night conditions.

As regards selectivity, care must be taken to see that the tuned circuits are accurately aligned, otherwise the performance in this respect might be easily misjudged. However, with due care in tuning and by close



The pressed-steel chassis forms a compact and rigid unit.



Complete circuit diagram. The coil at the bottom of the aerial coupling circuit is inserted to prevent break-through of medium-wave stations on long waves.

attention to the adjustment of the "Separator" and reaction controls, the London National and Regional transmitters could be confined in central London to band widths of 230-280 and 300-390 metres respectively.

On long waves Daventry and Radio-Paris can be tuned in clear of each other.

There can be little doubt that this set will more than satisfy the requirements of the man of limited means, and from the point of view of quality of workmanship and material it is fit to be ranked with sets of much higher price.

**NEXT WEEK'S SET REVIEW:**  
**SUNBEAM MIDGET**

## Letters to the Editor:—

# Valves or Stages ?

## Electrostatic Speakers : Ohms per Volt : Output

The Editor does not hold himself responsible for the opinions of his correspondents

### Valves or Stages ?

THE recent correspondence between Mr. Baggs and Mr. Barry Kay cannot be other than inconclusive if conducted on its present terms. Mr. Baggs maintains that, since nomenclature by both valves and stages must be misleading in respect of many details of design, it would be better to leave even the main framework of receivers altogether unspecified. Mr. Kay, on the other hand, apparently intoxicated with the ingenuity of the new designation, does not seem to envisage the fuller description of sets, but rests content with a considerable degree of vagueness.

A parallel may be drawn from the case of motoring. Those who held that cars should only be advertised on the basis of the number of their cylinders could never be made to agree with those who held the same view in respect of their horse-power. In either case it is clear that what is wanted is not alternative erroneous systems, but a fuller system which can give rise to no misapprehensions. The number of valves is necessary to give an estimate of costs of replacement; the number of stages, an estimate of performance.

But it is also clear that radio sets have now become such complex pieces of machinery that even the conjunction of valves and stages cannot adequately describe their abilities. If nothing were known about a certain car save that it had eight cylinders, it could not be positively affirmed that it was better than another car with two, for the relative efficiencies with which these cylinders were used might differ widely. Similarly, a four-stage set might be very inferior to a three-stage set if the first contained a detector and three low-frequency stages, and the second was a normal 1-v-1. The motoring public has set itself to master the intricacies of differing design, and is now well acquainted with fluid flywheels, automatic clutches, self-changing gear boxes, and so forth. There is no reason why the ignorance of the radio public, if such ignorance exists, should be pampered and encouraged. If it does not exist, there is still less reason.

There is no danger of misunderstanding in providing figures for the sensitivity, selectivity, and degree of automatic volume control, of all receivers. In America, the input-output ratio for the first figure has been related to a standard base; selectivity can be defined in terms of the detuning in kilocycles required to reduce a signal by a given proportion; while the effect of A.V.C. may be displayed by a simple graph. All these factors are within the understanding of the public, if they were carefully explained. Nothing but harm can arise from hazy and ill-defined statement. This type of error is well exemplified in the mention, criticised by "Free Grid," and made by Mr. Taylor, and no less an authority than Messrs. Ferranti, of "anode-to-cathode-streams." The reversal of these streams would, I feel sure, require the exercise of as great Authority as once reversed the waters of the Red Sea.

R. J. SPOTTISWOODE.

Oxford.

### Electrostatic Speakers

MANY thanks to WIRELESS WORLD and Mr. Scroggie for the excellent articles on the electrostatic speaker; a device which until now, in my opinion, has not received the attention it deserves. Experience has shown me that there is one practical point which it is very easy to overlook when designing a dual speaker combining electrostatic and moving-coil speakers. It is that on no account should the distance between the two units be less than 24in. from edge to edge.

It will be readily appreciated that when the electrostatic unit is in close proximity to the moving coil, its diaphragm will be, in effect, part of the baffle board, and, in consequence, considerable differences of air pressure generated by the moving coil will be developed on either side of it, with the result that the distance between diaphragm and fixed plate will vary at low frequencies. At first sight it would appear that this movement will only result in loss of radiation by the moving-coil speaker and possible rattle; but further consideration shows that, since the capacity of the electrostatic unit will be varied at low frequency, any notes reproduced by it will have their *intensity* modulated by the bass—a distinctly unpleasant effect which is all too common in the reproduction given by cheap moving-coil speakers with speech coils of very short winding length concentrated in the magnet gap to extract the last decibel of noise with an inadequate field density. L. H. MOORE.

Liverpool.

### Ohms per Volt

THE question of terminology is frequently raised in your columns, and, as far as I can see, the definitions and terms used by *The Wireless World* are those generally accepted by the Trade and the Technical Press.

Nevertheless, there is one expression used by yourselves and manufacturers to which a practical engineer may take exception; that is, the *ohms per volt* specification applied to voltmeters.

Taken literally, the description of a meter as 500 ohms per volt implies that a resistance of 5,000 ohms is in circuit at a reading of 10 volts, and of 50,000 ohms at 100 volts. Unfortunately, not all those connected with either the amateur or professional sides of wireless know how far this is from the truth, and that, provided the same meter or scale be in use, the resistance in circuit is the same in each case.

The vast majority of "voltmeters" are basically "current reading instruments," the internal resistance in series within the meter is determined by the maximum current reading and the maximum voltage to be measured. From this aspect the resistance as a specification would only be useful when coupled with the full-scale voltage reading. With it, a 100,000 ohms/500 meter would be equivalent to a "200 ohms per volt" meter. Though it would specify the

meter more definitely it would be clumsy, and would not immediately convey the information the engineer requires.

As both these terms depend entirely on the current taken by the meter at full-scale deflection the "goodness" of a voltmeter could be expressed much better by that current, and, so that there could be no misinterpretation, the fact that it is the *maximum* current could be added. What I suggest is that the above meter be specified as a "5 mA. max." meter.

The current taken at any voltage can be expressed by the formula:—

$$\text{Current} = \frac{\text{voltage reading}}{\text{full-scale reading}} \times \text{max. current.}$$

Thus, a reading of 50 volts on a "5 mA. max." meter with a full scale of 250 volts means that a current of 1 mA. is flowing.

The service engineer and the set constructor are often faced with the problem of the change in circuit conditions brought about by the insertion of a voltmeter into the circuit. As the estimation of the change is more easily calculated in terms of current flowing through the circuit resistances, the use of the above terminology would simplify matters considerably. The formula would be equally simple:—

$$\text{Voltage change} = \frac{\text{voltage reading}}{\text{full-scale reading}} \times \text{max. current} \times \text{resistance.}$$

This, of course, is neglecting any change brought about by the alteration of the D.C. resistance of the valve or valves in parallel with the meter.

I venture to suggest that the majority of engineers and constructors would welcome this simplification of our terminology, particularly when it also makes it more explicit.

London, S.W.5. W. MACLANACHAN.

### Output

THE following apparent fallacy may be of some interest to readers. Assume a power valve capable of a maximum undistorted output of 4 watts, with grid bias = 50 volts. If two such valves are connected in parallel, the maximum undistorted output will be 8 watts, so that if an A.C. voltage of 25 volts (peak) at frequency  $f_1$  be applied to the grids, the output will be 2 watts, since output is proportional to the square of the volts applied to the grid. Now apply another 25 volts (peak) at frequency  $f_2$  at the same time as the first. There will be then 2 watts of  $f_1$  and 2 watts of  $f_2$  in the output, making 4 watts in all, and in addition the valve grids will be fully loaded with 50 volts peak. On the other hand, if the valves are operated separately with 50 volts of  $f_1$  on one grid, and 50 volts of  $f_2$  on the other, each valve will give its full 4 watts output, and if these are combined there will be a total of 8 watts.

Under both conditions the valves are fully loaded, yet by separating the frequency components double the output is obtainable. The fallacy is obvious, but the example given is a strong argument for the use of a double output stage when separate high or low note speakers are used, unless, of course, the transmission is heavily modulated with one frequency only.

Persia.

LEAD-IN.

# New Apparatus Reviewed

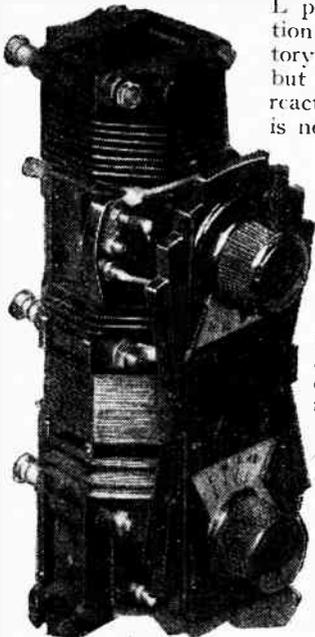
## Latest Products of the Manufacturer

### BRITISH GENERAL ALL-WAVE TUNER

THE British General Manufacturing Co., Ltd., Brockley Works, Brockley, London, S.E.4, who for long past have included an aerial unit giving continuous tuning from 200 to 2,000 metres in their range of components, have now further extended the idea and introduced an all-wave model covering the short, the medium and the long wavebands. The new tuner consists of a moulded former  $6\frac{1}{2}$  in. long with the various windings spaced sufficiently far apart to ensure that the idle sections have very little effect on the portions in use.

Two switches are included; the upper one is the wave selector and has four positions, two being for the short waves and one each for the medium and the long waves. Below this is a selectivity switch which changes over the aerial to different tapplings on the coil; it also has four positions.

The ranges covered by a 0.0005 mfd. tuning condenser are from just below 15 metres to 29 metres with the switch on S1; 26 metres to 76 metres on S2; 195 metres to 550 metres on M, and 835 to 2,220 in the L position. Reaction was satisfactory throughout, but a 0.0005 mfd. reaction condenser is necessary.



British General all-wave tuner covering short, medium and long waves.

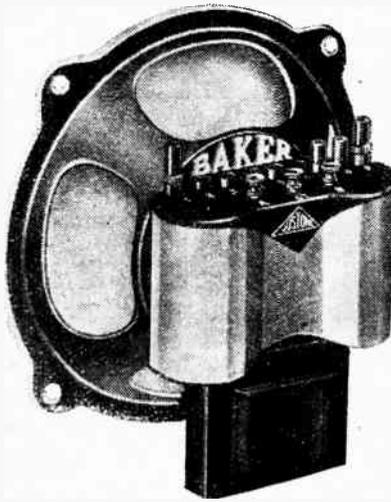
An H.L. two-volt type valve gives good results as a detector and enables smooth regeneration to be obtained. Only at the higher condenser settings on the short waves was reaction uncertain. There is, however, an adequate overlap. The price is 9s. 6d.

### A NEW BAKER UNIT

BAKER SELHURST RADIO have added to their range of moving-coil units a new model which will be known under the name of "Justone." It is constructed on the lines of the well-known "Permag" unit, and is fitted with a multilayer speech coil, which enables comparatively lower transformer ratios to be employed. This results in less leakage inductance, and a consequent improvement in high-frequency response.

The most important feature of the new unit is, however, the multi-ratio output transformer, which gives twenty ratios for

single-output valves and four for push-pull combinations, including Class "B" and



The new Baker Selhurst "Justone" loud speaker with 24-ratio output transformer.

Q.P.P. Alteration of the ratio gives a wide variety of frequency responses, and the user can readily modify the quality.

The price of the unit in chassis form is 45s., and cabinet models are also available.

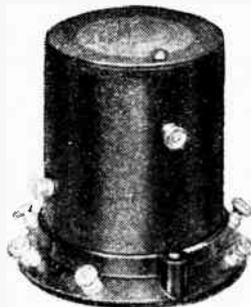
The makers are Baker's "Selhurst" Radio, 75-77, Sussex Road, Croydon.

### R. I. MICRION COIL

THIS new coil recently introduced by Radio Instruments, Ltd., Purley Way, Croydon, embodies a core of a specially prepared iron-dust alloy described as "Micrion." It is a screened dual-range coil intended to serve for aerial or H.F. coupling, and is provided with a tapping on the medium wave section for the aerial lead and a separate reaction winding. Waveband switching is not included.

The special feature of the coil is that the inductance of each section can be varied within certain limits by altering the position of the cores within their respective bobbins. This adjustment, effected by two small screws protruding through the side of the screen, gave an inductance variation of 160 to 180 microhenrys approximately for the medium wave coil and from 1,570 to 1,930 microhenrys for the long wave section in the case of the specimen tested.

This permeability adjustment affords a ready means for accurately matching the coils in the set under working conditions, and, furthermore, enables air and Micrion



R.I. Micrion coil embodying permeability adjustment of inductance.

coils to be used in the same circuit and their inductances matched for single dial tuning.

Our tests show the coil to be a particularly efficient one, and definitely better than a first-grade air coil of the familiar screened pattern. Compared on a basis of dynamic

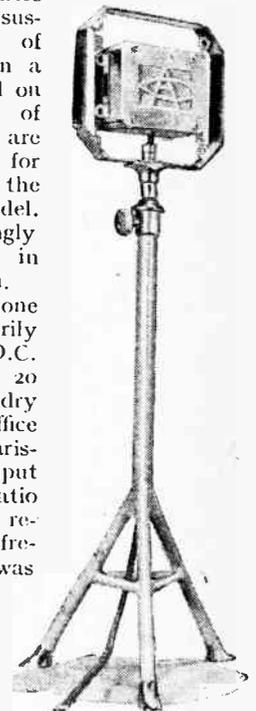
resistance values, the Micrion coil is about 40 per cent. better on the medium waveband and of the order of 30 per cent. on the long waves.

It should prove very convenient as a replacement coil where an air type one with external switching is now used, for the change-over can be effected with little trouble, and a worth-while improvement in selectivity and sensitivity will follow. The price is 12s. 6d.

### CORREX MICROPHONE

A MICROPHONE that is particularly well suited for use with public address amplifiers is the model HB, introduced by the Correx Amplifiers, 21, Marmora Road, East Dulwich, London, S.E.22. It is of the carbon pattern mounted in a strong rectangular metal case measuring  $3\frac{1}{2}$  in. x 3 in. x  $1\frac{1}{2}$  in. and being of a sensitive type requires to be mounted in a vibration free holder. The makers have adopted a suspension consisting of four coil springs in a metal frame carried on a telescopic stand of which two kinds are available; one is for table use and the other a floor model. These are strongly made and finished in grey and chromium.

The microphone operates satisfactorily with four volts D.C. and passes about 20 mA., thus a small dry battery will suffice to supply the polarising voltage. An input transformer with a ratio of 1 to 30 is required. On test the frequency response was



Correx carbon microphone and adjustable table-type stand.

found to be very good indeed, speech is clear and crisp and voices are easily recognisable. Although the microphone is quite sensitive it does not give a large output, the mean level being somewhat lower than that of an average pick-up. We found one additional stage of amplification desirable.

It is a particularly good example of the high standard now attained by the carbon microphone, and in view of its efficiency is not expensive at £6 10s. The stands cost £3 15s. in table form and £4 10s. for the floor model, while the input transformer costs 18s. 6d.

### RONNIE SCIENTIFIC EARTH TUBE

IT would seem hardly necessary to point out that the mineral compound used in this tube, reviewed in these columns last week, is not injurious to metal, as the acid content of the copper sulphate preparation has been neutralised by a chemical process.

# READERS' PROBLEMS

## An Eleven-stage Set

THERE is a tendency to classify receivers by "stages" rather than by the number of valves: a querist asks how the New Monodial should be described under this rating.

In this receiver there are a total of six amplifying stages, but if the expression "stage" be interpreted as an electron stream in a valve in the accepted way, there are eleven stages.

Another recent question with regard to the New Monodial relates to the fixed condensers. All these of a capacity of 0.02 mfd. or less are of the mica-dielectric type.

## Tuning Indicators

ALTHOUGH a milliammeter is perhaps too scientific a device to appeal to the general public, it is probable that it makes the best possible tuning indicator for the more knowledgeable enthusiast. At any rate, a number of readers have lately written to us on the use of a meter in this way; of course, the general adoption of A.V.C. has led to increased interest in visual tuning devices.

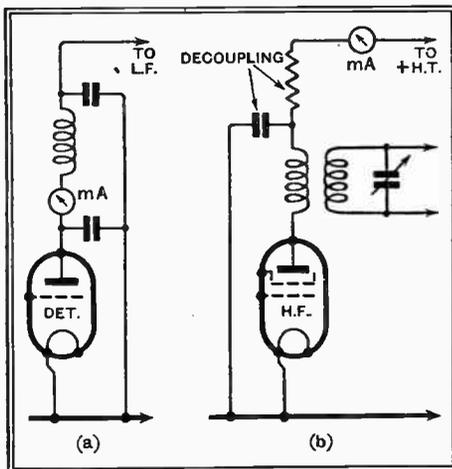


Fig. 1—Although often convenient, it is risky to join a milliammeter directly to the anode of a detector, H.F., or I.F. valve, as in diagram (a). The correct position is indicated in diagram (b).

One or two correspondents seem to have met with difficulties when adding a milliammeter to an existing receiver, but in every case their troubles may be ascribed to incorrect connections. The meter in question may be inserted in the anode circuit of the detector valve, or, more generally nowadays, in the anode circuit of one or more of the controlled valves. It should be emphasised that as a general rule it is dangerous to join the meter directly to the anode of the valve, as this course will very probably be productive of instability, or else it may upset ganging.

Connected as in Fig. 1 (a), in the anode circuit of a detector, the meter and its wiring will be at a high oscillating potential, and may cause excessive interaction with earlier stages. Again, it is often tempting to join the instrument directly to the anode cap of an S.G. valve acting as an H.F. or I.F. amplifier; here the risk of causing instability will be even more pronounced, and the capacity of the meter and its extra leads to earth will be additive to that already existing across the circuit.

THESE columns are reserved for the publication of matter of general interest arising out of problems submitted by our readers. Readers requiring an individual reply to their technical questions by post are referred to "The Wireless World" Information Bureau, of which brief particulars, with the fee charged, are to be found at the foot of this page.

The right position for the indicating meter is always at the low-potential end of the anode circuit (that nearest to the source of H.T. supply), as indicated in Fig. 1 (b).

## Proportional Amplification

IT is asked whether the lower audible frequencies may be over-accentuated in a resistance-coupled gramophone amplifier by employing a larger coupling condenser than usual between the stages.

We are afraid that nothing can be done in a pure resistance-coupled amplifier to strengthen the relative amplification of low notes. Even if a coupling condenser of infinite capacity were employed, the bass register would not be amplified to a greater extent than the high notes.

But, although nothing we can do will strengthen the low notes, a similar result can be achieved by weakening the upper frequencies by fitting by-pass condensers in either the grid or anode circuits.

## 25-cycle Hum

EVERYONE expects to find it easier to smooth rectified current derived from a standard 50-cycle A.C. supply than that obtained from 25-cycle mains. This is due mainly to the fact that the ordinary smoothing choke is much more effective at the higher frequency.

But in actual practice things do not always work out entirely according to plan. For instance, we hear from a reader whose supply has just been changed from 25 to 50 cycles that hum is now very much worse than before, in spite of the fact that his mains transformer has been tested, and is found to deliver the correct voltages under the new operating conditions.

His difficulty is most probably caused by a loud speaker resonance at 100 cycles (which will be the principal hum frequency at the new periodicity), but there is a possibility that the noisier background is merely due to the fact that all loud speakers have a much better response at 100 than at 50 cycles.

## The Wireless World INFORMATION BUREAU

THE service is intended primarily for readers meeting with difficulties in the construction, adjustment, operation, or maintenance of wireless receivers described in *The Wireless World*, or those of commercial design which from time to time are reviewed in the pages of *The Wireless World*. Every endeavour will be made to deal with queries on all wireless matters, provided that they are of such a nature that they can be dealt with satisfactorily in a letter.

Communications should be addressed to *The Wireless World* Information Bureau, Dorset House, Stamford Street, London, S.E.1, and must be accompanied by a remittance of 5s. to cover the cost of the service. The enquirer's name and address should be written in block letters at the top of all communications.

## Repeating a Warning

THE difficulties described by a constructor of a superheterodyne receiver, in which an unconventional layout is employed, may almost certainly be ascribed to the use of unsuitable screened wire, with too much self-capacity, in the anode circuit of the first detector valve. The symptoms point to the existence of an excessive stray capacity in the first I.F. transformer.

According to our experience, difficulties in ganging and trimming are often due to the fact that high-potential H.F. or I.F. leads are run in ordinary commercial metal-braided cable of the type sold for motor-car wiring, etc. It is wise to make it a rule never to use this wire in any H.F. or I.F. circuit; the safest type of screened conductor to use consists of metal-braided sleeving of large diameter, the internal wire being as thin as possible consistent with mechanical strength.

## The Loading Resistance

ONE or two readers are puzzled by the fact that, in the Ferrocart III receiver, a resistance which apparently serves no useful purpose is shunted across the smoothed output of the H.T. supply system; the resistance in question is marked R<sub>15</sub> in the original diagrams.

This is a loading resistance pure and simple. It happens that the anode circuits of the valves in this receiver require rather less than the full rated output of the eliminator, and the shunt resistance is therefore added in order to bring up the total load to that figure. It also serves another purpose; without it the energising current flowing through the speaker field which may be used as a smoothing choke would be less than is desirable for best results. As shown in Fig. 2, the resistance is so connected that current flowing through it, as well as the anode current for the valves, will also flow through the speaker field.

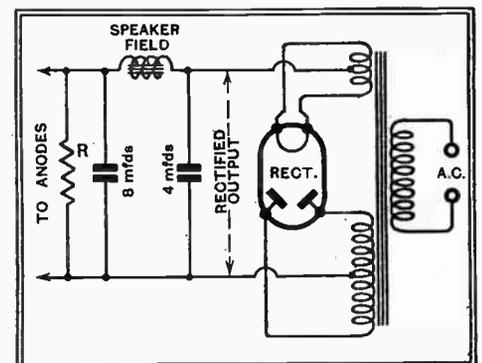


Fig. 2.—The artificial load resistance R prevents an undue rise in voltage and also ensures a sufficient flow of current through the speaker field.

It is often convenient to connect a load resistance in this way in order to prevent a rise in voltage. The necessary ohmic value is easily ascertained by dividing the desired output voltage of the rectifying equipment by "surplus current" (expressed as a fraction of an ampere). Surplus current is the difference between the estimated anode consumption of the valves, and the current at which the desired H.T. voltage will be maintained. The latter may be obtained from the valve maker's data.

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**VORTEXION**, Wimbledon, for 99.9% reliable transformers.

**IF** You Haven't Tried Them Yet Ask Someone Who Has, or call and inspect complimentary letters.

**GUARANTEED** 12 Months, and within 5% normal and 2 1/2% super models, neat shrouding, with detachable feet, as used by Government Departments, etc., etc.

**VORTEXION**—New Monodial transformer, 200-250, 50 cycles, 425-0-425, 120 m.a., 4v. C.T. 3a., 4v. C.T. 1a., 4v. C.T. 1a., 4v. C.T. 6a., screen primary, open type, 20/-; shrouded, 22/-; super shrouded, 26/-; weight 14lb., carriage 2 - extra; 10 henry choke, 5/6, post 9d.; 20 henry, 8/6.

**VORTEXION**—5-watt Monodial A.V.C. model, 400-0-400, 120 m.a., 4v. 6a., 4v. 3 1/2a., 4v. 2a., 4v. 1a., super screened, 20/-; shrouded, 24/-.

**ALL** Secondaries Centre Tapped.

**VORTEXION**—250.0-250 60 m.a., 4v. 1 to 2a., 4v. 2 to 4a., open type, 10/6; shrouded, 12/6; post 9d.

**VORTEXION** D.C.4 Choke, specified for D.C. superhet; 5/-.

**VORTEXION** Transformers, tested with 2,000 volts between windings.

**VORTEXION**—Ferracart III, 350-0-350, 60 m.a., 4v. 2.5, C.T., 4v. 3.5, C.T.; open type 13/6, shrouded 16/-; post 9d.

**VORTEXION**—Super model for H.T.8 or 9 or 10, 4v. 1 to 2, 4v. 2 to 4; open type 14/6, shrouded 16/6; post 1/-.

**VORTEXION**—350.0-350, 120 m.a., 4v. 2 to 5a., 4v. 2 to 4a., 4v. 2.5a.; open type 14/6, shrouded 16/6.

**VORTEXION**—400 or 450 or 500v., 120 m.a., 4v. 2 to 5, 4v. 2 to 5, 4v. 2 to 5; open type 19/-, shrouded 23/-.

**VORTEXION**—400 or 450 or 500, 150 m.a., 4v. 4a., 4v. 2.5, 4v. 2, 4v. 2, 4v. 2, core size 2 1/4 x 1 1/4 in., a super job, 2% regulation, 35/-; shrouded with terminals, less terminals, 30/-, open type 26/-; post 1/3.

**VORTEXION** Auto Transformers to B.E.S.A. Specification, 100, 110, or 120v. to 200, 220 or 240 volts, 60 watts, 9/-; post 9d.; 120 watts, shrouded 12/6, open type 10/6, post 1/-; 200 watts, open 14/6, shrouded 16/6, post 1/-; 2,000 watts, £4/10.

**VORTEXION** 600-watt Transformers; £4/10, carriage free.

**VORTEXION** 30h. at 60 m.a. Chokes, 5/6; 40h. at 60 m.a., 8/6; 30h. at 150 m.a., 200 ohms, 10/6 open type, 12/6 shrouded.

**VORTEXION** Transformers Made to Your Specification; price according to wattage, 6v. filaments same price unless wattage grossly exceeded; special quotations by return.

**VORTEXION** (S. A. BROWN), 182, The Broadway, Wimbledon, S.W.19. Tel.: Liberty 2814. [3820]

**N.P.** for Battery Chargers, from 62/6 to £17; trade lists and photographs.

**N.P.** lowest prices in trade, with largest outputs for A.C. mains.

**N.P.** Specialise in Battery Chargers; 28 volt 6 amps., £7.2.6; 40 volt 6 auaps., £8.5; 75 volt 6 amps., £11.5; trade lists.

**N.P.** Make a Special H.T. and L.T. Charger, 75 volts 2 amps., two circuits, £7/10; car battery charger, £5/15.

**N.P.** Give Full Information in Wiring Batteries and Advice on Charging; send for trade list free, and ask for what you require in output; state mains.—Nash Products, Ltd., Stechford, Birmingham. [3812]

**PARTRIDGE** Transformers.—Self praise is no recommendation, but praise from experts is significant.

**PARTRIDGE** Transformers—"a sound electrical job, very good value," *Wireless World*, Sept. 15th.

**PARTRIDGE** Transformers—"voltage regulation excellent, transformer remained remarkably cool," *"Radio Trade Review"*, May, 1933.

**PARTRIDGE** Transformers—"found to be excellent... designed on sound lines," *"Wireless Magazine"*, October, 1932.

**PARTRIDGE**—250.0-250v., 60 m.a., 4v. 1a., 4v. 2-4a., 11/-; 250.0-250v., 60 m.a., 4v. 1a., 4v. 2-3a., 4v. 1a., 12/-.

**PARTRIDGE**—350.0-350v., 60 m.a., 4v. 2-2 1/2a., 4v. 2-4a., 13/6; 350.0-350v., 120 m.a., 4v. 2-2 1/2a., 4v. 3-5a., 4v. 1a., 17/3.

**PARTRIDGE**—425.0-425v., 120 m.a., 4v. 2-2 1/2a., 4v. 3-5a., 4v. 2a., 20/6; 500.0-500v., 100 m.a., 4v. 2-2 1/2a., 4v. 3-5a., 4v. 2a., 21/-.

**PARTRIDGE**—500.0-500v., 120 m.a., 4v. 2-4a., 4v. 3-6a., 4v. 1-2a., 4v. 1-2a., 27/6; larger types to order.

**PARTRIDGE**—0-7 1/2-9-11v., 1.2a. 9/3; 0-15-18-22v., 1.2a., 10/-; any other model to order.

**PARTRIDGE**—135v. (tapped 110v.), 90 m.a., 4v. 2-4a., 10/6; 240v. (tapped 200v.), 200 m.a., 4v. 2-4a., 13/3.

**PARTRIDGE**—Step-up or step-down auto transformers, 60w., 10/3; 100w., 12/9; others to order.

**PARTRIDGE** Chokes.—611, 500 m.a., 45 ohms, 18/6; 13H., 200 m.a., 120 ohms, 11/6; 201L, 120 m.a., 320 ohms, 9/3.

**PARTRIDGE** Chokes.—30H., 60m.a., 550 ohms, 7/9; 401L, 40 m.a., 700 ohms, 6/6; all constant inductance.

**"WIRELESS WORLD"** A.V.C.3 Transformer, 13/6; W choke, 7/9; new Monodial transformer (competitive model), 24/-.

**LARGE** Power (5w. to 100w. speech) Output Transformers, for relay and P.A. work, frequency distortion within 1 db. from 50 to 8,000 cycles.

**PARTRIDGE** Transformers.—Trade enquiries invited.

**PARTRIDGE**, N. B.Sc.(Eng.), A.M.I.E.E., A.I.Rad.E.  
**PARTRIDGE**, N., King's Buildings, Dean Stanley St., London, S.W.1. Tel.: Victoria 5035. [3660]

**DAVENSET** £10/10 Charger, 25 volts 6 amps., new month ago; accept £7.—Staring, Victoria Rd., Stechford, Birmingham. [3823]

**"DULU"** Unused D.C. Eliminators, 25 milliamps output, 13/- each; post paid, cash with order or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. [3850]

Mains Equipment.—Contd.

HOYNE'S Transformers and Chokes the Best Obtainable, perfect insulation, regulation and reliability. HOYNE'S Transformers, used by many well-known set manufacturers after testing all others. HOYNE'S Transformers, fitted with tapped and screened primaries, filaments all centre tapped, stout cast aluminium clamps and clearly marked terminal strips are fitted to all models. HOYNE'S Components are Guaranteed for One Year; built to your own specification at very competitive prices. HOYNE'S Components.—The components you will eventually use, start right; a dud cannot pass the Hoyne test. HOYNE'S A.V.C. Three, 275-0-275v. 60-70 m.a., 4v. 7/6, post 6d. HOYNE'S New Monolial Transformer, 425-0-425v. 120 m.a., 4v. 3a., 4v. 1a., 4v. 1a., 4v. 24v., post 1/3; weight 10lb.; 10 henry choke, 6/., post 6d.; 20 henry choke, 7/6, post 6d. HOYNE'S—250-0-250v. 60 m.a., 4v. 1-2a., 4v. 2-4a., 10v., post 9d.; with extra 4v. 1-2a. winding, 12/6, post 1/-. HOYNE'S Ferrocart Model.—350-0-350v. 60-70 m.a., 4v. 2-3a., 4v. 2-4a., 12/6, post 1/-. HOYNE'S—350-0-350v. 120 m.a., 4v. 2-3a., 4v. 4-6a., 4v. 1a., 4v. 1a., 16v., post 1/3. HOYNE'S—500-450-0-450-500v. 140 m.a., 4v. 2-4a., 4v. 4-6a., 4v. 2a., 4v. 2a., 27/6, post 1/3; weight 11lb. HOYNE'S—0-110-135v. 90 m.a., suitable for H.T. 6 or 7, 7/6, post 9d.; with 4v. 2-4a. winding, 9/6, post 9d. HOYNE'S—200v. 200 m.a., 4v. 2-4a., 4v. 1-2a., for H.T. B. 13/6, post 1/-. HOYNE'S—Auto Transformers, Chokes and Filament Transformers always in stock. HOYNE'S Components Still Have No Equal. M. J. HOYNE, Offices and Works, 8a, Gladstone Rd., Wimbledon, S.W.19. Tel.: Liberty 3303. [3730]

CABINETS.

RADIO-GRAM Cabinets; fully illustrated list free; remarkable values.—Gilbert, Cabinet Maker, Swindon. [1686] EPTON Leads Again!—Handsome walnut cabinets, Philco type (15x12x7 1/4), polished, undrilled 10 6. unpainted, drilled 7/6; Atlas (16 1/2x12 1/2x9), 11/9; Alba (18x14 1/2x10 1/2), 14/-. Epton, 93, New Rd., Chingford, E.4. [3835] MANUFACTURER'S Clearance Lines of Cabinets for Radiograms, loud-speakers, and radio sets; hundreds to select from; send us particulars of your requirements, giving size of set, etc. H. L. Smith and Co., Ltd., 289, Edgware Rd., London, W.2. [3832]

DYNAMOS, ETC.

1 h.p. 720v. B.T.H. Generator, suit transmitter; nearest £6.—Griffiths, "Silverlee," Porthcawl. [3791] ROTARY Converters, 220 volts D.C. to 200 volts A.C., capacities up to 0.44 K.V.A., from £4/10.—Milo Engineering Works, Milo Rd., East Dulwich, S.E.22. Phone: Sydenham 4422. [3641]

GRAMPHONES, PICK-UPS, ETC.

B.T.H. Universal on Stainless Table, with 2 B.T.H. pick-ups, 70/-. B.T.H. R.K., 15/-. Hollinger, Garden Suburb, Oldham. [3830]

LOUD-SPEAKERS.

FERRANTI A1 Speaker, perfect; offer nearest £5 secure.—Thornton, Rossetti Av., Burnley. [3808] B.T.H. RK Moving Coil Speakers, guaranteed new, unused, manufacturers' surplus, original price. 6 Guineas, highly sensitive and wonderful tone response, will handle up to 10 watts output, available for 6v., 100v., 200v. D.C., 30v., also A.C. models. £2/10; carriage paid, c.o.d. or cash with order; the best value in speakers obtainable to-day.—O. H. Seekamp, First Avenue House, High Holborn, London, W.C.1. Phone No.: Holborn 6609. [1425]

MAGNAVOX Moving Coil Loud-speaker, D.C.143, 7,500 ohms, 3-ratio transformer, 10in. diaphragm; £1 10.—Box 8304, c/o The Wireless World. [3787]

All Steel Speaker Pots are 50% More Efficient; made in all sizes up to 6in. dia., 10in. long; also field windings for same up to 100 watts; prices and particulars by return.—H. Crompton, Woodfield Terrace, Bury. [3831]

30/- !!! B.T.H. R.K. moving coil speakers, 6in. cone, new and unused, guaranteed; these speakers are the type as used in cinema sound equipment; suitable for public address work; weight 30lb., and vastly superior to the cheap speakers now on the market, 100 volts, 150 volts, and 200 volts D.C. 27/6 !!!—6-volt D.C. speakers, as above; £2/7/6 speaker as above for 100-250 volts A.C., complete with field rectifier.

B.T.H. Transformer, brand new, ratios 1-1, 2-1, 20-1, and 30-1 microphone; 7/- each.

CARRIAGE Paid, cash with order, or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3771]

H.D. RADIO ELECTRICAL SERVICE Offers Surplus of a Set Manufacturer, every article guaranteed new, moving coil speakers, Magnavox type D.C. 144, 2,500 or 7,500 ohms resistance, with multi ratio transformer, at 18/-; type D.C. 142, same voltages, at 25/-; all goods carriage paid; cash with order or c.o.d.—No. 9, Kingly St., Regent St., London, W.1. [3848]

CHAL-ELECTRIC Offer New Boxed Set Manufacturers' Surplus Rola Speakers, all fitted humbuckers, state if power or pentode required; F6, following voltages, 2,000 ohms, 2,500 ohms, 4,700 ohms, 6,500 ohms, list 35/-, at 18/-; F7, voltages as in F6s, list 47/6, at 25/-; permanent magnets, F6 P.M., list 49/6, at 28/-; F7 P.M., list 53/-, at 33/-; all goods carriage paid; cash with order or c.o.d.—Chal-Electric, No. 6, Conduit St., London, W.1. [3846]

VALVES.

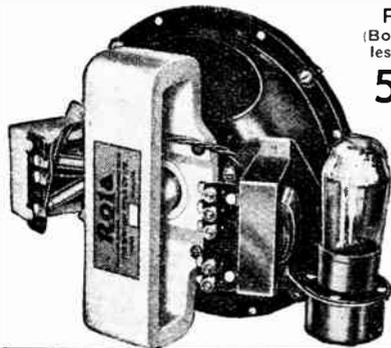
EPTON Leads Again!—Lissen P625a, 4/3; Triotron 8431N, 5/6; American valves, all types.—Epton, 93, New Rd., Chingford, E.4. [3836]

ROLA the World's Finest Reproducers

QUALITY Class B for Every Battery Set Owner

No battery set owner need be without the advantages of Class B Amplification. By using a Rola Class B Speaker Amplifier Unit, which takes only 5 seconds to connect, the volume of the set is instantly increased about 5 times.

Model A—For MULLARD P.M. 2B, B.T.H. PD 220, COSSOR 220B, STANDARD 13BI, HIVAC B220, MARCONIPHONE B21, G.E.C. B21, CLARION B22. Model B—For COSSOR 240B, FERRANTI HP 2, CLARION B 24.



PRICE (Both Models less Valve) 57/-



ROLA CLASS B SPEAKERS

No matter what class B Valve you are using there is a Rola Class B Speaker to match its characteristics. Like all Rola speakers these Class B Units are unrivalled for realistic reproduction.

For MULLARD P.M. 2B, B.T.H. PD220 COSSOR 220B, STANDARD 13BI, HIVAC B220, MARCONIPHONE B21, G.E.C. B21, CLARION B22.

Table listing Rola Class B Speaker models and prices: ROLA FR5-PM-33 Class B ..... 29/6, ROLA FR6-PM-23 Class B ..... 39/6, ROLA F6-PM-23 Class B ..... 49/6, ROLA F7-PM-23 Class B ..... 60/-

For COSSOR 240B, FERRANTI HP2, CLARION B24.

Table listing Rola Class B Speaker models and prices: ROLA FR5-PM-32 Class B ..... 29/6, ROLA FR6-PM-22 Class B ..... 39/6, ROLA F6-PM-22 Class B ..... 49/6, ROLA F7-PM-22 Class B ..... 60/-

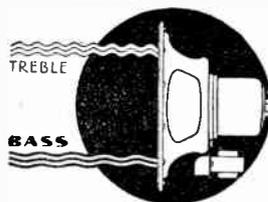
EXTENSION SPEAKERS.

There is a correct Rola Extension Speaker for practically all British Radio Receivers. Rola Speakers are used by the large majority of British Radio Manufacturers. As it is highly desirable to have the speech coil impedance of the Extension Speaker suited to that of the speaker in the receiver the advantages of using Rola Extension Speakers are manifest.

The British Rola Co., Ltd., Minerva Road, Park Royal, N.W.10. Phone: Willesden 4322-3-4-5.

ROLA SPEAKERS

for better Radio Reception



Valves.—Contd.

THE M.R.D. Co.'s Own New British Valves, guaranteed 6 months, carriage paid; we invite tests against any other make.

2-VOLT Range.—V.M./S.G., S.G.2, 7/6; L.F.2, H.F.2, H.L.2, R.C.2, 3/6; driver, 4/-; P2, 4/6; Pen. 2, 10/-; class B, 1 1/2 watts, 9/-; 3 watts, 9/-; also A.C. range; any details and characteristics on request.—Mains Radio Development Co., 4-6, Muswell Hill Rd., London, N.6. [3839]

8/9—Ostar Ganz valves, any type; buy a spare set while our stocks last, state type and voltage required; c.o.d., postage paid.—Kay, 167, City Rd., London, E.C.1. [3814]

THE Following English, American and Continental valves in stock; Philco, Triotron, Tunggram, Hivac, and 323 valves; prompt attention.—Newman, 309, Roman Rd., Bow, E.3. [3699]

All Latest Types of Brand New American Valves, first class makes: 247s, 235s, 224s, 236s, 237s, 233s, 245s, 244s, 12/-; 227s, 226s, 280s, 245s, 9/6; 242s, 232s, 11/-; U.N.210s, 15/-; U.N.250s, 7 watts output, 16/-; 281s, 14/6; post paid, cash with order or c.o.d.—Ward, 12, Tredegar Rd., Bow, E.3. Tel.: Advance 3668. [3772]

SPECIAL Offer.—Valves by world-famous Continental manufacturers, fully guaranteed, screen grid, variable mu screen grid, high magnification screen grid, low magnification screen grid, H, H.L., L, R.C. power, super power, directly heated pentode, directly heated power pentode; all the above standard mains type, 4/6 each; 300v. 60 milliamp. rectifier 5/6, 350v. 120 ma. 6/6, 500v. 125 ma. 7/6; the following 4 volt battery valves at 2/- each, H, H.L., L, power, screen grid.—Premier Supply Stores, 20-22, High St., Clapham, S.W.4. Macaulay 2188. [3795]

COMPONENTS, ETC., FOR SALE.

PREMIER. PREMIER SUPPLY STORES Offer the following Set Manufacturers' Surplus New Goods at a fraction of the Original Cost, all goods guaranteed perfect, carriage paid over 5/-, under 5/- postage 6d. extra (Ireland, carriage forward).

ELIMINATOR Kits, including transformer, choke, Westinghouse metal rectifier, T.C.C. condensers, resistances and diagram, 120v. 20 m.a., 20/-; trickle charger 8/-; extra; 150v. 30 milliamperes, with 4v. 2-4 amps. C.T., L.T. 25/-; trickle charger, 6/6 extra; 250v. 60 milliamperes, with 4v. 3-5 amps. C.T., L.T., 30/-; 200v. 100 milliamperes, with 4v. 3-5 amps. C.T., L.T., 49/6; 300v. 60 milliamperes, with 4v. 3-5 amps. C.T., L.T., 37/6.

T.C.C. Condensers: 750v. working, 2 mf. 3/6, 4 mf. 6/-, 4 mf. 450v. working 4/-, 250v. working 1 ml. 1/-, 2 mf. 1/9, 4 mf. 2/6, 1,500v. working Standoff insulators 0.5 mfd. 1/6, 2 mfd. 6/-, aqueous electrolytic 440v. working, 4 mf. 3/-, 8 mf. 3/6.

ALL the Following Lines 6d. each or 5/- per dozen: 4- and 5-pin chassis mounting valve holders; shielded screen grid or pentode leads 1-watt wire end resistances, any value. 0.1 condensers; on-off switches push-pull; polar ganging devices: 0.02 condensers. 0.5 condensers. POLAR 3-gang 0.0005 Condensers, split end vanes, totally screened disc drive; 6/11.

MSCO Triple-gang 0.0005 Condensers, with trimmers, 4/11.

T.C.C. Electrolytic Condensers, 100 volts working, 15 mfd., 1/3.

PREMIER Chokes, 40 m.a., 25 hys., 4/-; 65 m.a., 30 hys., 6/-, 150 m.a., 30 hys., 10/6.

PYE Chokes 20 or 32 hys., 4/-; Premier multi-ratio output transformers, giving 15 different ratios, 7/6.

AMPLION High Inductance Chokes, resistance 2,500 ohms, 80 henrys, 60 m.a.; 5/6.

WESTINGHOUSE Metal Rectifiers: 120v. at 20 m.a., 6/6; 180v. at 5v. m.a., 8/6; 8v. at 1/2 amp., 6/6; 6v. at 1 amp., 9/6.

HARLEY Pick-up, complete with arm and volume control; 12/6.

BRITISH RADIOPHONE Wire Wound Potentiometers, with mains switch incorporated, 5,000 ohms, 10,000 ohms, 50,000 ohms, 100,000 ohms, 250,000 ohms, any value; 3/6.

KOLSTER BRANDES Gramophone Motors, dual type, can be worked by clockwork or mains, No. 1 induction type 100-250 volts, 27/6; No. 2, A.C. and D.C., 100-250 volts, 27/6; both the above complete with all fittings and turntable.

SPECIAL Offer.—Microphones by prominent manufacturer, high sensitivity, uniform response, complete with stand, transformer and battery; listed £3/15, our price 18/6.

DUBLIER Condenser, 300v working, 4+4+2+2+2+0.1 +0.1+0.1 6/-; 1,000v working 1 ml., 1/6.

PREMIER Accurate Meters, moving iron, flush mounting, accurate; 0.15, 0.50, 0.100-0.250 milliamperes, 0.1, 0.5 amps., all at 6/-.

ORMOND Condensers, 2-gang, semi shielded; 2/6.

SPECIAL Offer of Mains Transformers, manufactured by Philips, input 100-115v. or 200-250v., output 180-0-180 volts, 40 m.a., 4v. 1a., and 4v. 3a., 4/6; 200-0-200v., 4v. 1a., 4v. 3a., 4/6.

ALL Premier Guaranteed Mains Transformers have engraved terminal strips with terminal connections, input 20-250 volts, 40-100 cycles, all windings paper interleaved.

PREMIER H.T.8 Transformers, 250v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 25/-.

2,000+2,000 Electrolytic, 12 volts working; listed 27/6, 2 at 10/-.

PREMIER H.T.9 Transformer, 300v. 60 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 25/-.

PREMIER H.T.10 Transformer, 200v. 100 m.a., rectified, with 4v. 3-5a. C.T., L.T., and screened primary, 15/-; with Westinghouse rectifier, 26/-.

MAGNAVOX, D.C.144, 2,500 ohms field, with hum-bucking coil, Pentode transformer, 17/6; complete with A.C. conversion kit, 27/6.

DOUBLE Spring Motors, made by Garrard, play five sides, of 10in. record, complete with turntable and all fittings; 17/6.

MICHAEL 2-screen Grid Pentode Transportable 4, complete; gets many stations; £6/15.

SPECIAL Offer.—Accumulator chargers, input 200-250v. A.C., to charge 2- and 4-volt accumulators at 1/2 amp.; owing to the high efficiency of the silver oxide rectifier employed charger may be used during broadcast; 9/6 each.

(This advertisement continued on next page.)

Components, etc., for Sale.—Contd.

(This advertisement continued from previous page.)

**R**ELIABLE Canned Coils with circuit; 3/-, accurately matched; dual range.

**P**REMIER L.T. Supply Units, consisting of Premier transformer and Westinghouse rectifier, inputs 200-250 A.C. output, 8v. 1/2 amp., 11/6; 8v. 1 amp., 14/6; 15v. 1 amp., 19/-; 6v. 2 amp., 27/6; 30v. 1 a., 37/6.

**P**REMIER Mains Transformer, output 135v. 80 m.a., for voltage doubling, 8/6; 4v. 3-4a., c.t. L.T., 2/- extra; Westinghouse rectifier for above, giving 180v. 30 m.a., 8/6.

**P**REMIER Mains Transformers, output 250-0-250 volts 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened screened primary, 15/-.

**P**REMIER Mains Transformers, output 350-0-350 volts, 90 m.a., 4v. 3-5a., 4v. 2-3a. (both c.t.), with screened primary, 15/-.

**P**REMIER Mains Transformers, output 400-0-400 volts, 100 m.a., 4v. 4-5a., 4v. 2-3a., with screened primary, 15/-.

**P**REMIER Auto Transformers, 100-110/200-250 volts or vice versa, 60-watt, 7/9; 100-watt, 10/-.

**S**PECIAL Offer of Manufacturers' Type Transformers, any input, output 250-0-250 volts, 60 m.a., 4v. 1a., 4v. 3a. (both c.t.), 8/6; H.T. transformer, with 4v. 3-4a. (c.t.), 8/6; with rectifier, 18/6.

**A**MPLION Mains Transformers, input 100-250 volts, output 350-0-350 volts, 120 m.a., 4v. 5a., 4v. 2a., 6v. 1a. (all c.t.), 17/6.

**F**ILAMENT Transformers, polished and engraved terminal boards, N.P. terminals, 4v. 3-4a., 5/-; 10v. 3a., 6/6; 12v. 1a., 5/-; 4v. 4-6a., 6/6; 14v. 4a., 6/6; 22v. 1a., 6/-; 6v. 2a., 5/-; 9v. 1a., 5/-; 35v. 3a., 15/-.

**P**REMIER Eliminators, input 200-250 volts, 40-100 cycles, A.C., incorporating Westinghouse metal rectifiers, output 250v. 60 m.a., S.G. and 120v. taps, 42/6; with 4v. 4a. c.t. L.T., 7/6 extra.

**P**REMIER Eliminators, output 150v. at 30 m.a., S.G., and 100v. tap, with 4v. 3-4a. c.t. L.T., 37/6; or with trickle charger, 42/6.

**P**REMIER Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps, 27/6; with L.T. trickle charger incorporated, 35/-.

**P**REMIER D.C. Eliminators, output 120v. at 20 m.a., S.G. and 100v. taps, 15/-.

**A**CCUMULATOR Chargers, 200-250 volts A.C., all incorporating Westinghouse metal rectifiers; 2, 4., and 6v. at 1/2 amp. 2/5; 2, 4., and 6v. at 1 amp., 17/6; 12v. 1a., 27/6; 6v. 2a., 35/-; 12 v. 1.5a., 30/-; 6v. 3a., 39/6; 30v. 1a., 42/6; 50v. 1a., 62/6.

**B**T.H. Induction Type (A.C. only) Electric Gramophone Motors, 100-250 v.; 30/- complete.

**A**MPLION Moving Coil Speakers, type E.M.644, dual fields 2,500 and 5,000 ohms (100 and 200v.), with output transformer, 12/6; A.C. conversion kit for this speaker, 10/- extra.

**W**ESTERN ELECTRIC Condensers, 250v. working, 1 mfd., 6d., 2 mfd. 1/-; 500v. working, 1 mfd., 1/-.

**T**C.C. Condensers, 250v. working, 4x4x1 mfd., 3/6; 6x4x2x2x2 mfd., 37/5, working, 6/11; 4x4x1, 6/-.

**S**PECIAL Offer of Wire Wound Resistances.—4 watts, any value up to 10,000 ohms, 1/-; 8 watts, any value up to 15,000 ohms, 1/6; 15 watts, any value up to 50,000 ohms, 2/-; 25 watts, any value up to 50,000 ohms, 2/6; 50 watts, any value up to 50,000 ohms, 3/6.

**W**IRE Wound Potentiometers, 15,000 ohms, 1/6; Centralab Potentiometer controls, 50,000 ohms, 2/-.

**F**OR Cables Only.—The following valves, guaranteed new—

**P**HILIPS 328 Valves for L.T. Charging, 5/6; 329 Barretter lamps, 2/-.

**P**REMIER SUPPLY STORES, 20-22, High St., Clapham, S.W.4. Macaulay 2188. Closed 1 o'clock Wednesdays, open to 9 o'clock Saturdays. Nearest Station, Clapham North Underground.

**P**REMIER. [3778]

**A**MATEUR'S Surplus for Sale; stamp for list.—Hes, 25, York Rd., Swindon. [3784]

**M**ILDMAY RADIO EXCHANGE Offers the Following, sound and perfect:—

**C**OLVERN, K.B.L.C. pair, and K.S.R., 17/6; C.A.I. triple tuning unit, 30/-; Ready Radio S.T.400 or S.T.500 coils, 6/6 pair; Lotus L.F. transformers, listed 10/6, 5/6 each; Ready Radio Instamat output transformers, 10/- each.

**W**EARITE G.L.32 Superhet Chassis, 25/-; Lewcos or Wearite superhet coils, 4/6 each; J.B. 4-gang chassis mount condenser, 17/6; J.B. 4-gang, fully screened, 20/-.

**E**KCO Radiocorders, with pick-ups, 30/- each; Marconi Senior speaker magnets 15/- each; Ferranti S.D.1 D.C. moving coil speaker, 50/-; Ferranti A.P.4, 8/-; A.F.3, 11/-; A.F.5, 17/-; A.F.5C, 19/-; A.F.5C.C, 21/-; O.P.M.C, 14/-; O.P.1, 1-1, 7/6; O.P.2, 25-1, 8/-; O.P.M.8, 10/-; R.J. 100 m.a. choke, 10/-; Pye tapped output transformers, 6/6 each; Lotus mains chokes, 5/- each; Climax H.F. chokes, 3/- each.

**C**OLLARO Type 32 Combined A.C. Motors and Pick-up, fully automatic, 59/6; Collaro Empire model, less pick-up, 37/6; Garrard A.C.4 motors, with fully automatic plate, 32/6.

**A**L.L. Post Paid.

**P**HONE: Clissold 5001.

**O**PEN Thursday, closed Saturday all day.

**24**, Mildmay Grove, London, N. [3799]

**W**OBURN RADIO Offer Following Set Manufacturers' Clearance Lines:—

**B**AKER Selhurst "Motor" P.M. Speakers, 21/-; Clix valve holders, 2/6 per dozen; fixed condensers, Polymet and Dubilier, all sizes, 3/6 per dozen; Siemens 4 mfd. 500v., 2/3; 0.01x0.01 mfd. 3,500 v., 1/7; Hydra 2 mfd. 500 v., 1/3; Ready Radio short wave coils, 2/- each; Class B driver and choke, 9/6 per pair; Erie and Dubilier resistances, 1/2 watt, 4/6; 1 watt, 6/6 dozen, 4 watt 50,000 and 100,000 9d.; B.T.H. R.K. Junior, 6/12v., 17/6 (carriage forward); Amplion 0.0005 mica condensers, 9d.; 0.0003 differentials, 10d.; British Radiophone output transformers, ratio 32-1, 18-1, 23-1, 4-11 each; K.B. output transformers, 33-1, 2/6 each; H.F. Binocular choke, 1/3; H.F. chokes, 10d.; Edison R.C.C. units, 1/6; Dur-Amansco 3 gangs, with trimmers, 4/11; Spaghetti resistances, 3/- dozen; Ready Radio extensor condensers, 0.0005, 2/6; Simpsons electric tuntable, 17/6; we supply any make of set on terms, also make up Monodials to your own requirements.—Woburn Radio Co., 7, Woburn Buildings, W.C.1. Euston 1571. [3841]

Components, etc., for Sale.—Contd.

**R**ELIABLE Canned Coils with circuit; 3/-, accurately matched; dual range.

**S**ELECTED Parts for Sale, as new; c.o.d. or "Wireless World" deposit system, which we recommend if in doubt as to the splendid value offered; we take risk of damage in transit to our customers; goods tested for callers and guaranteed.

**T**O Clear.—Igranite mains transformers, half wave, 550v. 60 m.a., 7.5v., 7.5v., new, 6/-; ditto, 250/250, 100 m.a., 4v. 1 amp., 10/6; Varley 350/250, 75 m.a., 3-4v., 6v., 17/6; Parmeko 250/250, 60 m.a., 2-4v., 6v., 20/-; Vortexion 250/250, 120 m.a., 2-4v., 6v., 15/-; H.T.7, with R.I. transformer and 4v. 6 amp., 20/-; all with 200/250v. input.

**T**O Clear.—Brown Vee cone units, new, 9/6; R.I. 7/14H. Chokes, second-hand, 10/-; Magnavox D.C.144 2,500 ohm speakers, 18/6; British Radiophone 3-gang condensers, 0.0005, new, with trimmers, proper cover and disc drive, all fittings, 15/9; Truotron 8 mf. wet electrolytic, 440v., 3/6; Polar 2-gang tubes, 6/6; Polar 3-gang tubes, with trimmers, 10/-.

**C**LARKES 4v. 5-amp. Transformer, 240/50v., 6/6; Philips ditto, for 200v., 6/6; Heaybert tapped input, 4v. 3 amp., 6/-; Gambrell Senior Novotone, for medium resistance pick-ups, 50/-; Varley 3001H. choke, 10/-; Varley dual S.P. choke, 10/-; Lissen 350v. 60 m.a.x2 4v. windings, 9/-; Savage 400v. 90 m.a., 3 4v. windings, 16/-.

**T**RANSFORMERS.—Ferranti A.F.5, 18/6; A.F.6, 15/6; O.P.M.1c, 16/6; O.P.M.6, 14/-; O.P.M.2, 14/-; B.I. choke, new, 13/-; B.5, new, 17/6; Lissen Super, 7/6; R.I. straight line, tapped secondary, second-hand, 7/6; Lissen 23-1 output, 6/-; Lissen 1-1 output, 5/6; Lissen large G.P. choke, 18/1, at 60 m.a., 6/6; Ryall's 350v. transformer, 3 4v. windings, 120 m.a., 16 clear, 15/6; solder strips.

**T**O Clear.—Mullard H.T. unit, 150v. 30 m.a., 240v. input, 25/-; Six Sixty 200v. 30 m.a., 4v. 5 amp., input 200v., 25/-; Philips 150v. 25 m.a. input 200v., 25/-; with rectifier valve; Ekeo A.C.25, 40/-; Amplion P.A. microphone, £3.

**R**YALL'S RADIO Offer Reliable Resistances, suitable for all sets where a 1-watt resistance is specified, in values 100, 250, 500, 1,000, 2,000, 5,000, 10,000, 15,000, 20,000, 25,000, 30,000, 40,000, 50,000, 75,000, 100,000, 150,000, 250,000, 1-meg., 2-meg., all values stated in ohms, 6d. each; also 2-3-watt type, 1,000, 10,000, 9d.

**N**EW Output Transformers Similar to R. and A., ratio 18 23 32, 6/-; Telsen 0.05 mica condensers, 2/3; T.C.C. 0.01 mica type M. 1/-; new Paxolin formers, 1in., slotted, with guiders, 8d.; T.C.C. 2 mf., 350v. working, 1/6; ditto, 1 mf., 1/3, new; T.C.C. 4x4, 250v. working, 4/9.

**P**AIRS New Polar Twin S.M. Thumb Drive, 0.0005, complete, 12/6; Telsen 100h. chokes, 3/-; Westinghouse H.T.4 and A.4 rectifiers, with Varley transformers, £2; Cylon 0.0005 double thumb twin extensor, 15/6; Cylon single 0.0005 extensor, 7/6; Ready Radio 0.0005 extensor condensers, new, 3/6.

**R**ADIOPHONE Pots with Switch, 5,000, 10,000, 25,000, new, 2/6 each; new type Magna speaker, 2,500 ohm and 5,000 ohm, 42/6 each complete.

**E**DISON BELL 10,000 Eureka, wire wound, with holders, 1/-; Edison Bell 0.0005 universal log all-metal condensers, 1/6, new.

**S**PECIAL Offer of Pye 20h. Chokes, 40 m.a., 130 m.a. maximum, D.C. resistance 300 ohms, in brown crystalline finish, new, unused, Pye 32h. chokes, D.C. resistance 750 ohms, 30 m.a., 80 m.a. maximum, ditto, 6/3 each, post free.

**W**EARITE and Lewcos Superhet. Coils, 5/-; 3-range oscillator, 7/6; T.C.C. 2,000 mf. electrolytic, 9/-; T.C.C. ditto, 250 mf., 100v., 8/6; Igranite L.F. choke coupling units, 3/9; Lotus new 4-gangs, 15/9.

**R**YALL'S Mains Condensers, 4 mf., 250v. working, 2/6; 4 mf., 500v. working, 4/6; 4 mf., 750v., 6/6; 2,000v., 17/6; Ryall's condenser blocks, 2-4 mf., 2-2 mf., 500v. working, 9/6; Dubilier 2x2, 500v. working, 2/6.

**R**YALL'S Mains Transformers, 250v. 60 m.a., 4v. 1 amp., 4v. 3 amp., 10/6; 350v., 12/9; H.T.7, with 4v. 4 amp., 10/6; 4v. 3 amp. only, 6/9; chokes, 25h. at 60 m.a., resistance 260 ohms, 6/9; 20h. at 100 m.a., 8/9; 10h. 8/9, for Monodial; 40h. at 100 m.a., 10/6.

**M**ETERS, moving coil, made for Ryall's Radio, guaranteed one year, and to B.E.S. first grade specification, all panel flush type, bakelite case, 0.5 m.a., 0-20 m.a., 0-50 m.a., 21-; each; 0-250v., 32/6; 0-300v., 35/-; 1,000 ohm per volt, zero adjuster, size 3/4in.

**M**ETERS, as above, moving iron, first grade, air damped, zero adjuster, 0-250v. A.C., 18/-; 0-50 m.a. A.C. and D.C., 15/-; non damped, without zero, 0-12v., 10/-; 0-250v., 12/-; 0-3 amps., 10/-; 0-20 m.a. A.C. and D.C., 10/-; 0-50 m.a., ditto.

**W**E Hold a Large Stock of First Class Radio Apparatus, Meters, resistances, condensers, heavy chokes, and all set requirements, at bargain prices, all modern goods.

**R**YALL'S RADIO, 33, Chancery Lane, London, W.C.2 (nearest Tube Chancery Lane; bus 67 passes door, or tram to Savoy St.), Holborn 3529. Open Saturday afternoon. Close 7 p.m., Thursdays 1 o'clock, Saturday 6 p.m.

**R**. [3805]

**S**URPLUS RADIO Offer the Following at Ridiculous Prices:—

**W**IRE Wound Potential Dividers, 4,500, 3,000, 2,000 ohms, and 15,000, 12,000, 8,000 ohms, both 60 watt; at 1/6 each; postage 3d.

**D**ITTO, 5 watt, 40,000 and 23,000 ohms, 40,000 and 80,000 ohms, 40,000 and 100,000 ohms, 30,000 and 50,000 ohms, 20,000, 20,000 and 20,000 ohms; all at 1/- each; postage 3d.

**T**WO Resistances, 600 ohms, 4,500 and 500 ohms, 60 watt; at 1/6 each; 3d. postage.

**T**HREE Resistances on 1 Tube, 2,500, 1,000 and 80 ohms, 5 watt; at 1/- each; postage 3d.

**S**INGLE Resistances, 5 watt, 8,000 and 65,000 ohms; at 6d. each; postage 3d.

**14** Mid. Block Condensers, 2 types, 750v. D.C. test, tapped 4-62-1-1 and 3-9-2; at 4/- each; postage 6d.

**O**NE Mid. Condensers, 750v. D.C. test, at 8d. each, postage 2d.; 4 mfd. condensers, 750v. D.C. test, at 1/6 each, postage 4d.

**D**DOUBLE Smoothing Chokes, mounted, sound, robust job, 120 m.a., 14-23 henries each, usual price 35/-, our price 6/3 each, 9d. postage; single ditto, 4/6 each.

**E**ACH Article is Tested Before Despatch, and guaranteed first class manufacture.

**C**ASH with Order; all goods despatched same day.—The above from Surplus Radio, 32, Queensway, Ponders End, Middlesex. [3845]

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A witty customer of ours,  
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that the set is working or not,"  
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**HARTLEY-TURNERS  
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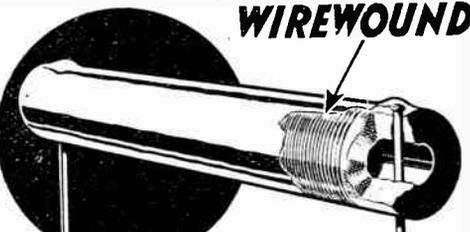
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WHAT YOU WANTED  
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A resistance that will not break down, one that  
will stand high overloading, is moisture-proof  
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The Hywatt is a definite advance in Resistance  
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Due to its wire element it is unchangeable in  
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Positive METAL TO METAL wiring. Firm grip and full contact with ALL sockets with internal diameters from 1/4 in. to 5/32 in. battery socket. Curved ends for easy insertion. Price 1 1/2 d.

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**THE DIX-ONEMETER.** The ideal of multi-range, moving coil meters. Built to first-grade British Engineering Standard. 50 ranges on one meter. Measures Microamps to 20 amps, millivolts to 1,000 volts, 50 ohms to megohms. Six Terminals. Two clear scales, mirror, and knife-edge pointer for accurate reading. Complete in case. 60/-.

**THE DIX-MIPANTA VEST POCKET TESTER.** A wonderfully versatile moving-iron multi-range meter for service on A.C. jobs. No projecting terminals. THREE ranges of volts: 0-7.5, 0-150, 0-300. Used for MILLIAMPS reads: 0-12 m.A., and 0-75 m.A. In black bakelite case. Measures only 2 1/2 in. by 2 1/2 in.

Complete in case with pair of test leads and plugs. Leaflet "W" gives full information. 19/6.

**S. G. BROWN'S BATTERY SUPERSEDER** makes H.T. from your L.T. 2-volt battery, rectified and smoothed. 3 tappings. A boon to those who are not on the mains. Reduced from £3 15/-. New and Guaranteed, 37/6.

**LESDEX CHARGERS.** We have 25 models to offer and build special types to special requirements. Three popular sizes are the AC109A for 36 cells at £10/9/-; the AC106 for 108 cells at £12/10/-; and the Lesdex Super Six for 200 cells at £32/7/6. Ask for Charger Leaflet "W".

**ELECTRADIX RADIOS,** 218, UPPER THAMES STREET, E.C.4. Phone: City 0191.

Components, etc., for Sale.—Contd.

**SOUTHERN RADIO'S** Wireless Bargains.—Set manufacturers' guaranteed surplus.

**MAINS Transformers.**—250-0-250 volts 60 m.a., 4v. 1a., 4v. 2.4a., 11/-; 250-0-250 volts 60 m.a., 4v. 1a., 4v. 2.3a., 4v. 1a., 12/-; 350-0-350 volts 60 m.a., 4v. 2 1/2 a., 4v. 2.4a., 13/6; 350-0-350 volts 120 m.a., 4v. 2 1/2 a., 4v. 3.5a., 4v. 1a., 16/-; 500-0-500 volts 100 m.a., 4v. 2 1/2 a., 4v. 3.5a., 4v. 2a., 19/-; step-up or step-down transformers, 0, 100, 110, 200, 250 and 250 volts, 60 watt output 12/6, 100 watt output 14/9.

**SMOOTHING Chokes.**—20 henrys, 120 m.a., 320 ohms, 8/9; 50 henrys, 60 m.a., 560 ohms, 7/8; 40 henrys, 40 m.a., 700 ohms, 6/6.

**A.L.L. Mains Transformers and Chokes** Guaranteed for 12 Months, specials quoted for and delivery given within 3 days of order.

**VARIABLE Condensers.**—Polar 3-gang 0.0005, complete with dial, knob, escutcheon, 11/- (list 35/-); Lotus 2-gang 0.0005, complete with dial, knob, escutcheon, 8/6; all ganged condensers are fully screened, with trimmers, and boxed; Hydra block condensers, new, 16 mid., 2 1/2 + 2 1/2 + 1 1/2, 1,000 volt test, 7/- each; 4 mid., 2/6; 2 mid., 1/9; 1 mid., 1/7.

**SPEAKERS.**—Rola F6 permanent magnet, 28/- (listed 49/6); D.C. mains energised, 2,500 to 6,500 ohms, complete with humbucking coils and transformers, 16/6 (list 39/6); G.E.C. Stork speakers, complete in magnificent cabinet, 19/6 (list £3/15); Ormond speakers, complete in cabinets, 10/- (listed 25/-); Blue Spot, 100U, 13/6 (list 37/6).

**CONSTRUCTORS' Kits.**—Ready Radio "303" battery 3-valve kits, less valves, 18/- each; complete with 3 Mullard valves (P.M.11.F., P.M.2, 2D.X.), 33/- each (list 79/-); Ready Radio Meteor screen grid, 3-valve kit, less valves, 26/- with 3 Mullard valves (P.M.12A, P.M.2D.X., P.M.2A), 49/- (list £5/7/6); Universal Radio 3-valve kits, ready assembled on chassis, 12/6 (listed 45/-).

**READY Radio "303" A Kits,** complete with cabinet, M.C. speaker, less valves, £2/5; with 3 Mullard valves (P.M.11.F., P.M.2D.X., P.M.2), £3/5 (list £6/17/6).

**READY Radio Meteor "A" 3-valve Screen Grid Kit,** complete with cabinet, M.C. speaker, less valves, £3/7/6; with 3 Mullard valves (P.M.12A., P.M.2D.X., P.M.2A.), £4/10 (list £8/7/6).

**READY Radio S.T.400 Kits,** as specified by Scott Taggart, £2/19/6 each (list £4/17/6); Mullard Radio for Million 3-valve A.C. kit, complete with 3 Mullard A.C. valves (Pend.V., 354V., 84V.), £3/19 (list £6/10); Mullard Radio for Million 3-valve battery kits, complete with 3 Mullard valves, £3/3 (list £6/2/6), all kits brand new, in original sealed cartons.

**B.T.H. Senior Pick-ups,** 1934 model with volume control, 28/- each (list 37/6); 6 only, B.T.H. Junior pick-ups, 17/6 (list 25/-); H.M.V. volume controls, 1/6 each (list 12/6).

**RECEIVERS.**—Burgoyne 3-valve battery transportable sets, complete with valves, batteries, accumulator and speaker, £3/2/6 (list £7/19/6), new, in cartons.

**A.L.L. Goods** Guaranteed New and Perfect and Sent Carriage Paid.

**BRANCHES** at 271-275, High Rd., Willesden Green, N.W.10, and at 48, Lisle St., W.C.2, where callers are cordially invited to inspect our large stocks of wireless bargains. Please send all post orders to 323, Euston Rd., N.W.1.

**SOUTHERN RADIO,** 323, Euston Rd., London, N.W.1 (near Warren St. Tube). Phone: Museum 6324

**EXPERIMENTER'S Surplus for Sale:** write for list, stamp.—White, Bucknill's Close, Epsom. [3793]

**CHAL-ELECTRIC** Offers Set Manufacturers' New Surplus, plus all carriage paid, cash with order or c.o.d.

**VARIABLE Condensers,** Polar Star, 1933, complete with disc drive, dial light covers, trimmers, etc., list 30/6, at 18/-; J.B. Nu Gang, complete as above, at 17/6; Polar Uniknob, fitted complete as above, 10/-.

**COILS** (6 sets only)—Colvern Ferrocart, Fl, F2, and F3, with switching, ganged on base, 32/-; new Midget type (3 set), 3-ganged, 32/6.

**CONDENSERS.**—C.E.C. Murphy, etc., 800 D.C. test, 250 A.C. working, 1 mid. 1/1, 2 mid. 1/9, 4 mid. 2/6; all the following are 1,500 D.C. test, 500 A.C. working, 800 peak: 1 mid. 1/9, 2 mid. 2/4, 4 mid. 4/-; multiple banks, all separate tappings: 20 mid., 4+4+2+2+2+2+1+1 mid., 11/-; 9 mid., 4+2+2+2+1 mid., 6/9; 5 mid., 2+2+1 mid., 4/9.

**MAINS Transformers and Chokes.**—Tapped and screened primary, Phillips, 500-0-500 at 120 m.a., 4v. 2.5 amps, 4v. 2amps, 4v. 5 amps, 250-0-250 at 60 m.a., 4v. 1 amp, 4v. 1 amp, 4v. 3 amps, 12/-; 250-0-250 at 75 m.a., 4v. 1 amp, 4v. 5 amps, 13/-; chokes, 30 henry, 75 m.a. (500 ohms), 6/9; 30 henry, 60 m.a. (500 ohms), 6/6; 20 henry, 20 m.a. (350 ohms), at 9/6.

**ASK for Special Quotation for Anything You May Need.**—Chal-Electric, No. 6, Conduit St., London, W.1. [3847]

**1/6, post free;** wonderful bargain: Centralab variable resistances and potentiometers, in maker's boxes.

**POTENTIOMETERS.**—Power, 15 ohm, 175 ohm, 1,000 ohm, 2,000 ohm, 5,000 ohm; great power, 400 ohm, 500 ohm, 1,000 ohm; standard, 6,000 ohm, 20,000 ohm, 50,000 ohm.

**VARIABLE Resistances.**—Power, 6 ohm; standard, 6 ohm, 2,000 ohm, 5,000 ohm, 8,000 ohm, 25,000 ohm, 50,000 ohm, 200,000 ohm.

**J. D. WIRELESS Co.,** 195, Breck Rd., Liverpool. Phone: Anfield 1078. [3801]

**METERS** Moving Coil, Weston 301; 10 m.a. and upwards, 22/6; Galvos 30-0-30, 27/6.

**NEW British Made,** 1 m.a., 27/6; 250 volts (1,000 w. per volt), 32/6; Turners 20 m.a. upwards, 17/6; thermo ammeters, 1.5a, 22/6; French 3-range, 3 m.a., 6v., 240v., 22/6, 2-range, 2 m.a., 240v., 20/-; German 2 m.a., 25/-; 2,000 volts, 32/6; assorted makers, 25 m.a. and upwards, 10/6; laboratory apparatus in stock; meter repairs a speciality.—The Victoria Electrical Co., 47, High St., Battersea, S.W.11. Phone: Batt. 0780. [0355]

**GILBERT INDUSTRIES** Parcels and Components.—"A", "B" and "D" parcels still available by return (see issue October 6th).

**OUR Famous 30 m.a. 180v. A.C. Eliminator Kit,** complete in every detail, has now been redesigned with a still smarter case and heavier rectifier; price remains at 30/- post paid while supplies last.

**GILBERT INDUSTRIES, Ltd.,** 519, London Rd., West-cliff, Essex. Phone: Southend 492071. "Come and see us Sunday morning." [0402]

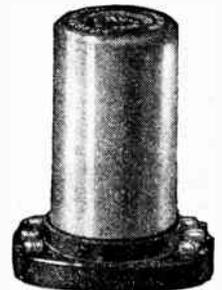
**AMPETERS,** hot wire 1/2 amp, Johnson, Phillips, new, 2/9, postage 3d.; tester cell, precision M.C., 3-0-3, Eversheds, 10/-, postage 6d.—Beaton, Chalk Farm Rd., N.W. [3809]

# BENJAMIN

Ensures

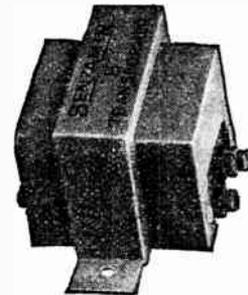
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Do not risk disappointment by using cheap components, you may be lucky, but most probably you won't. Make quite certain of success by using Benjamin Proved Radio Products: each individual component is perfectly made, and may be employed with complete confidence in whatever set you construct.



TRANSFEEDA

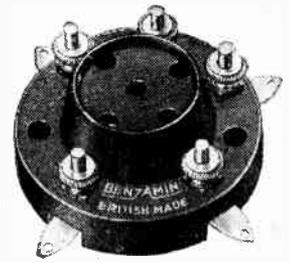
The Transfeeda used in the L.F. Stage will result in improved quality with full amplification. Suitable for following all types of valves. Price - - 11/6



"B" DRIVER

Class "B" input Driver transformer for use with all types of circuits and valves. Tapped to give choice of over all ratios 1 1/2:1, 1:1. Price - - 10/6

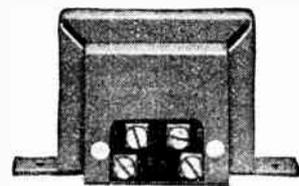
Benjamin 4-pin valveholders with self-aligning positive-grip sockets and solder tags integral with springs.



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Benjamin 5-pin and 7-pin valveholders are fitted with easy wiring reversible terminals and special self-cleaning contacts.  
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**A**C High Tension Eliminators, input 200/50 volts, output 150 volts 30 m.a., 3 pos.appings, one fixed, one continuously variable, Westinghouse rectified, finest components, guaranteed, 25/-; 3 pos.appings, for S.G., 28 6; post 1/3; also in 100/110 volts input.  
**D**C Eliminators, 200-250 volts input, output 150v. 30 m.a., one fixed, one continuously variable tapping, 10/-; 3 pos.appings for S.G., 12/6; post 9d.  
**G**ENUINE Reisz P.A. Microphones for all Speech Amplifying, 55/-; nickel plated stand, with rubber suspension, 15/-; special matched transformer, 5/-; all post free.  
**E**X Manufacturer's Mains Transformers, suitable Ferrocart III, tapped 200/50v. input, outputs 350-0-350v. 70 m.a., 4v. 2a., 4v. 3-4a., C.T., 9/6; post 9d., a real snip.  
**E**X Manufacturer's Heavy Duty Smoothing Chokes, 50h. at 50 m.a., 5 6; post 6d.  
**S**PECIAL Offer.—Utility 0.0005 condensers, with S.M. drum dial and escutcheon plate, new, boxed; 5/6; post 6d.; dial alone listed, 10/-.  
**P**YRE Mains Transformers—200/50v. input, outputs 135v. 80/100 m.a., 4v. 4a., C.T., 6/6, post 9d.; smoothing chokes, 50h. at 30 m.a. C.I., 600 ohms, 3/9, post 9d.  
**S**PECIAL Offer.—Ebury synchronous electric clock movements, robust, reliable, 200-250v. 50c.; 16/6; post 6d.; write for full details.  
**C**ONDENSER Bargains.—All working voltages, T.C.C. 3 mf., 80v. 5/-, post 6d.; 9 mf. (4+4+1) 250v., 3 6, post 6d.; 15 mf. dry electrolytic, 100v. for auto G.B. decoupling, 1/3, post 2d.; all as new; Siemens 4 mf. 250v., 2/-; Hydra 2 mf., 250v., 1/6, all post 4d.  
**L**AMPLUGH Silver Ghost Moving Coil Speakers, 6,500 ohms, new, boxed, 12/6; post 6d.  
**F**INAL Clearance Offer.—Blue Spot 100" inductor speakers, new, boxed; listed 35/-, 14/6; post 1/-.  
**H**AYBERD Mains Transformers, 200/250v. input, outputs 100v. tapped 80v. 70 m.a., 4v. 4a. C.T.; 10/6; post 9d.  
**C**HASSIS Mounting Valve Holders, 4-5 pin, 3d each. post 1d.; 2/6 doz., post 3d.; Loewe 4 Watt vacuum resistances, 50,000 and 100,000 ohm, 9d. each, post 1d.; bargain; manufacturer's parallel feed intervalve transformers, 2/6, post 3d.; toggle switches, 6d., post 1d.  
**A**LL Goods 3 Days' Approval Against Cash, or c.o.d.

**E**BURY BRIDGE RADIO Co., 33, Ebury Bridge Rd., S.W.1, near Victoria Station (No. 11 bus to Ebury Bridge). Sloane 8407. [3849]

**M**ICROPHONE and Transformer, Philips; cost 60/-, accept 30/-; Miles, 10, Edgar Rd., Sanderstead, South Croydon. [3813]

**M**AINS Transformers, new.—For H.T.5 rectifier, 6 6; ditto, with 4v. 4a. C.T., 8/6; for H.T.8, with L.T. 4v. 4a. C.T., 12/6; others in stock.

**M**OIVING Coil Speakers, new.—200 to 250 volt field windings, 10/-; output transformer, 6/-; postage 9d. —63, Abbots Drive, North Wembley, Middlesex. [3843]

**M**ODERN RADIO Again Present the Most Stupendous Bargains of Set Manufacturers' Surplus Yet Offered; all goods offered are post free except I.F.S.

**P**HILIPS Mains Transformers, 100-240 volts input, output 250-0-250 volts, 60 m.a., 4 volts 4 amps. C.T., 4 volts 1 amp., 5/-; eliminator transformer, input 210 volts, output 200-0-200 volts, 30 m.a., 4v. 1 amp., 2 6.

**P**HILIPS Block Condensers, 300 volts working, 4x3x1.5 x 0.5-0.5x0.2; 2 9 each.  
**P**HILIPS 6,000 ohm Volume Controls, with mains switch, 3/6; Kolster Brandes loud-speakers, in solid oak cabinet, model 295, new and boxed, 10 11; model 287, in solid oak cabinet with sloping sides, 12 6, a superior model.

**P**AXOLIN Panels, 18x7 1/2, 1/- each, 9/- per dozen; 14x7 1/2, 9d. each, 7 6 per dozen.

**A**C Ampmeter, reading 0.15 amperes, 3 6 each; Erie 4 watt resistors, 350, 15,000, 20,000, 25,000, 100,000, and 250,000 ohms, 8d. each, 6/9 per dozen.

**G**IVRITE 1,000 ohm Wire Wound Resistances, 6d. each, 4/- per dozen; Philips mains transformers, 210 volts input, output 200-0-200 volts, 30 m.a., 4 volts 3 amp. C.T., 4 volts 1 amp., with screened primary, 4/6.

**L**OEW E Vacuum Resistances, with wire ends for soldering, 3,000, 10,000, 15,000, 25,000, 50,000, 100,000, 1 p., 1 m., and 1 meg., and 0.005 condensers 3d. each, 2/- per dozen; special price for quantity.

**L**OEW E Vacuum Type Resistances, 2 watt type, 50,000 and 100,000 ohms; 8d. each, 6/9 per dozen.

**L**EX-MARCONI Shrouded Smoothing Chokes, 590 ohms, 30 m.a., 30 henry, nice clean job; 3/- each.  
**P**HILIPS Tapped Smoothing Chokes, 1,200 ohms, tapped at 800, 40 m.a., 20 henry.

**F**ARRAND Inductor Speakers, absolutely new and boxed; listed at 45/10, our price 25/-.

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**T**WO Complete Portable Talkie Outfits, made by Associated Sound Equipments, sound on film, can be seen and heard working at the below address.

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**SPOT Cash for Modern Components, etc.**—Economic Radio Co., 96-98, South Lambeth Rd., S.W.8. [3291]

**WESTINGHOUSE Charger, preferably type R.G.C.1.**—Weaver, 22, Princess Victoria St., Bristol, 8. [3817]

**NEW or Second-hand Kits, sets and parts, bought, sold, exchanged;** best exchange allowances.—R. Wigfield, Furlong Rd., Goldthorpe, Yorks. [3823]

**WANTED, all components, high power amplifying equipment, transformers, chokes, valves, condensers, microphones;** state lowest price.—J. D. Wireless Co., 195, Breck Rd., Liverpool. [3803]

**WANTED, M.C.1/50 Philips output valve, 2769 Philips rect. valve, D.0/60 Mullard output valve, must have full emission;** quote lowest price.—J. D. Wireless Co., 195, Breck Rd., Liverpool. [3802]

**FERRANTI, Weston meters, Ferranti transformers, and other quality components** bought for prompt cash; manufacturers' surplus stocks, largest purchasers in Midlands; prompt cash settlement.—Radio Mart, 19, John Bright St., Birmingham. [3827]

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**SITUATIONS VACANT.**

**RADIO Testers Required;** applicants must have held similar appointment; write fully to Chief of Test, Ekco Wks., Southend-on-Sea. [3676]

**TESTERS (experienced) Required,** only those used to Band Pass sets, capable of adjusting and matching.—Blue Spot, 94-6, Rosoman St., E.C.1. [3972]

**SERVICE Engineer Wanted,** experience manufacturers' service dept., preferably H.M.V.; prepared assist sales when required. Write Maxwell, Woking. [3788]

**Situations Vacant.—Contd.**

**RADIO Testers Required for Factory in East London;** applicants must be experienced in up-to-date methods; write stating age and previous experience.—Box 8357, c/o *The Wireless World*. [3709]

**WANTED, capable engineer** for maintenance of test gear in modern radio factory; applicants must have electrical engineering knowledge in power, high frequency and instrument work and be neat and quick mechanic; London district.—Box 8356, c/o *The Wireless World*. [3708]

**MECHANIC-DRAUGHTSMAN**, to take charge of department, required by established firm manufacturing radio receivers; up-to-date knowledge of mass production mechanical methods and initiative essential; salary up to £400 per annum; sound mechanical training preferred to academical draughtsmanship.—Box 8441, c/o *The Wireless World*. [3794]

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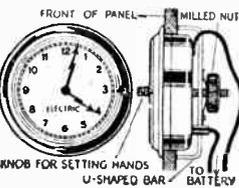
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**TECHNICAL Assistant (22)**, London, requires change; five years' experimental; thorough knowledge design of valve set makers' test gear; specialised automatic test gear.—Box 8462, c/o *The Wireless World*.

**ASSOCIATE Member, I.R.E.**, 4 years radio and electrical school, English and American radio and testing equipment experience, desires position with progressive manufacturer as laboratory or service engineer.—Box 8419, c/o *The Wireless World*. [3786]

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**"The Wireless World" Diary for 1934** contains, in addition to the usual diary section, 78 pages of facts, figures and explanations, including circuit diagrams of complete receivers and details of receivers; size 4 1/2 x 3 1/2 in., bound leather cloth; price 1/6 net, by post 1/7 from the Publishers, Hiffe and Sons Ltd., Dorset House, Stamford St., London, S.E.1. [0403]



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NO MAINS NEEDED!  
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Works off small battery lasting 12 months, or can be plugged into G.B. Battery without affecting reception. Uses practically no current. Fits into hole 3 1/2" dia. in any panel up to 1" thick. Easy to fix—no screws required. Only 1" from front of panel to back of case. Swiss movement. Hands set from front. Nickel plated bezel. Useful addition to any set.

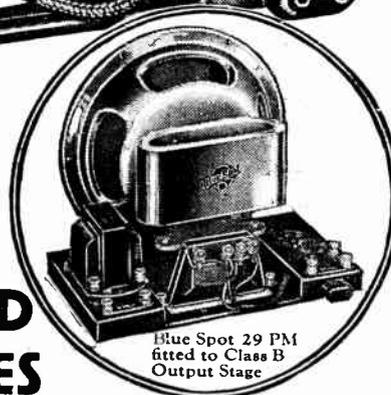
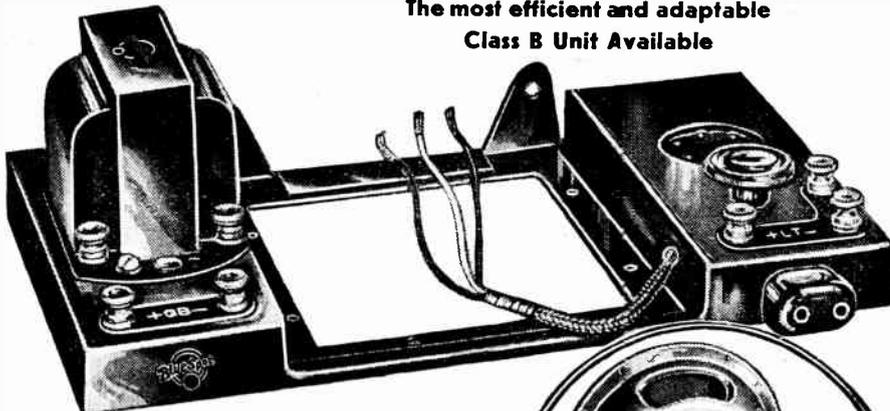
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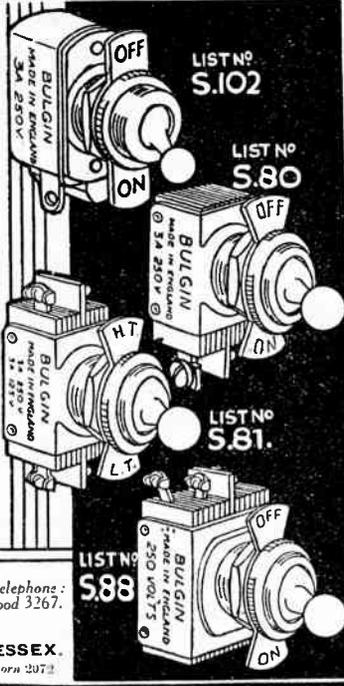
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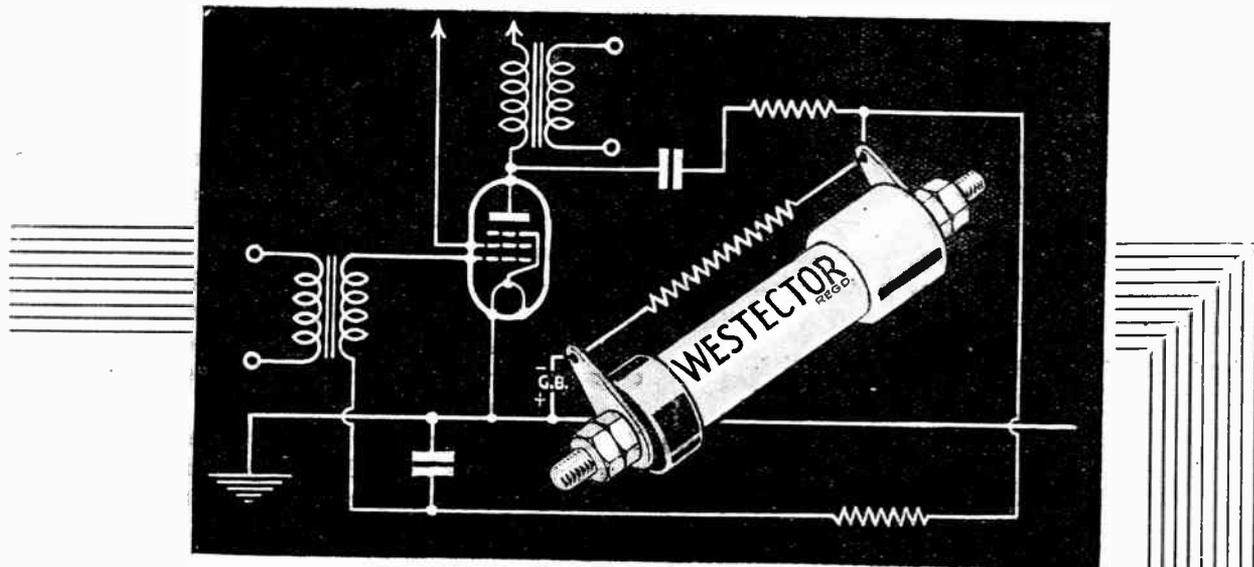
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# For technical men only

## The MAZDA L.2/DD



We are directing this advertisement at you because we should like you to know more about our valves than can be expressed non-technically. This week we want to talk about our L.2/DD because we think it is of topical interest.

If you own a Battery set so much the better. If not, there must be a friend of yours who often envies the advantage of A.V.C. in

Mains operated sets. This particular valve is mainly designed for providing A.V.C. in battery sets and for the elimination of detector loads and distortion in any battery receivers. The valve is a double-diode-triode and consists of two separate diodes and a triode working on a common filament. (By the way, the filament consumption is only 0.1 amp.). It is fitted with a standard five-pin base, and the input grid to the triode section is connected to a top cap.

### The Use of the L.2/DD as a Detector Amplifier in Normal Sets.

As you know, the majority of battery receivers using triode valves as detectors suffer from overloading which results in distortion and elimination of output on a strongly modulated station unless excessive anode currents are employed.

The use of this valve will have the following advantages:

- (a) The detector cannot be overloaded, and the larger the input signal the smaller will be the distortion present.

- (b) Due to the fact that the H.F. Signals are not applied to the triode section, and also because the grid is not biased back by the rectified voltage, and may thus be biased at its optimum point, a much larger output can be obtained.
- (c) As a result of the advantage shown in (b) foregoing, resistance coupling may be employed in the triode section. This means anode current economy, and is very desirable from quality considerations in receivers employing Class "B" output stages.
- (d) By allocating the function of detection and amplification to separate electrodes, H.F. Voltages may be eliminated from the low frequency amplifying section and troubles due to instability and overloading will be avoided.
- (e) On the case of sets not employing reaction, damping due to anode feed back is removed (in the case of power grid detectors, this damping is far greater than that introduced by grid current).

### TENTATIVE RATING. Triode Section.

Filament Volts	-	-	-	-	2.0
Filament Current (amps.)	-	-	-	-	0.1
Maximum Anode Volts	-	-	-	-	150
†Mutual A.C. Conductance m/a	-	-	-	-	1.6
†Amplification Factor	-	-	-	-	16
†Anode A.C. Resistance (ohms)	-	-	-	-	10,000

†Taken at Ea 100, Eg 0.

### INTER-ELECTRODE CAPACITIES

Anode to Grid	-	-	-	-	4.0
Anode to Cathode	-	-	-	-	4.0
Grid to Cathode	-	-	-	-	3.25

You can always obtain further details from your dealer but we hope that what we have said has been of interest to you.

Some take chances . . .

Others buy



The Safety Valve

Mazda Radio Valves are manufactured in Great Britain for The British Thomson-Houston Co., Ltd., London & Rugby.



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