

**RADIO IN THE FAR NORTH** (SEE PAGE 576)

# Popular & Wireless & TELEVISION TIMES

SOME UNUSUAL  
AERIALS

EVERY  
WEDNESDAY  
PRICE

3<sup>0</sup>

No. 766.  
Vol. XXX.  
Feb. 6th, 1937

**A MIGHTY SET FOR THIS MEMORABLE YEAR!**

*Next Week:*

**JOHN SCOTT-TAGGART**

Will Present His Special

**CORONATION SET**

**THE SUPER CENTURION**

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# POPULAR WIRELESS AND TELEVISION TIMES

Editor: G. V. Dowding

Asst. Editors: A. Johnson-Randall, A. S. Clark

BUSY B.B.C.  
TIMELY TIP  
NEW STATION

## RADIO NOTES & NEWS

SINGING MOUSE  
MY STARS  
DON'T SHOOT

### Lifeboat Radio

NOT long ago the Margate lifeboat put out to the assistance of a French vessel which sank in the vicinity with the loss of seven lives. Half an hour after the lifeboat had started her struggle with the seas it became known that she was making for the wrong position, but there was no means of informing her, for she was *not fitted with wireless*.

The first SOS from a ship in distress often gives an estimated and inaccurate position, afterwards corrected. It seems vitally important that rescuing vessels should be able to communicate with the ships they are trying to save. The Royal National Lifeboat Institution is fully alive to this situation, and has carried out extensive tests with lifeboat communications.

### Engineering Excitement

ENGINEERS of the B.B.C. are already wondering whether they are going to squeeze in all they have got to do this year before the wild bells ring out across the snow for 1938.

Six months ago they were facing an ambitious programme, with Coronation prospects to complicate it. And recently it was decided to nip in a new station for the South Coast in 1937, at Start Point, and improve West Country reception.

Now comes the rumour of a possible string of ultra-short-wave relay stations to supplement the Regional service, starting with an aerial on Broadcasting House. Such a scheme brings us down to television wavelengths—and when television is mentioned the said engineers roll their eyes zenithwards and groan with one accord.

For what Sir John says goes; but the engineers are the fellows who carry it through.

### "Telegraph's" Timely Tip

WRITING recently to the "Daily Telegraph," a correspondent points out that any all-mains receiver can

be rendered independent of the mains in an emergency by the mere addition of a crystal detector and phone terminals. Wired across the first tuned circuit, these enable the programmes to be followed should the grid blow down, the power station blow up, the fuse blow out, or the roof blow in.

He suggests that manufacturers of mains sets should make this simple provision; and I commend the idea, and further suggest that constructors and handymen

and correspondents of our Queries Department in particular will gratefully recall his initials, for he had a wide and sympathetic grasp of the constructional problems of the set-builder.

While gardening at home with a scratched finger he contracted tetanus. Symptoms developed within a few days, and despite all efforts, he died on January 23rd.

Our deepest sympathy—and yours, I know—extends to his young wife and to his relatives.

### MANCHURIA'S NEW STATION



Modernistic design is a feature of the new Manchurian broadcasting station at Dairen. Note the call letters J Q A K on the building. General Electric Co., photograph.

should "roll their own." Not only might the scheme be valuable in a national emergency, but it also might save the set-owner from feeling such a fool when visitors ask him to get the news on a broken-down set.

### In Memoriam

It is with deep regret that I have to record this week the death of one of the most popular members of "P.W.'s" staff, Mr. J. R. Wheatley. Stunned by the suddenness of the tragedy, we who are left can hardly believe that his friendly presence has been withdrawn for ever.

J. R. Wheatley joined "P.W." in 1925,

### The Rising River

YOU remember the fellow who boasted of the fine house he had bought "with the river at the bottom of the garden," but who found, on his next visit, that the garden was at the bottom of the river! Well, the River Seine has often given the Parisians that kind of shock. And because of the Seine's habit of turning a landscape into a waterscape at certain seasons, the architects of the U.S. Pavilion, to be built on the banks of the river for the forthcoming exhibition, urgently needed the plans to lay the foundations. The plans were in New York, and Old Man Atlantic was in between. "How come?" said the architects.

Then somebody remembered the radio picture service. Brows were unbent, backs were slapped, and, amid a chorus

of "You seditis" and "Atta boys!" the order was given to transmit the plans by wireless picture service across the Atlantic.

A few hours later the plans were in Paris; another bit of radio and architectural history had been made, and the boys had gone out for a quick one in celebration.

### New Tunis Station

The French authorities have earmarked 10,000,000 francs as a *dot* for the new Tunis station, which is to be the biggest in Northern Africa. There is talk of using 150 kilowatts.

(Continued overleaf.)

NEXT  
WEEK:

# JOHN SCOTT-TAGGART'S CORONATION SET

## TELEVISION TELESCOPES TO HELP ASTRONOMERS

### Quiet as a Mouse

THE old adage about being as quiet as a mouse has been shattered into a million-sided smithereens by America's latest radio star. She is Minnie the Singing Mouse, who you heard about in our American page last week.



She was discovered by the curator of an industrial home for children. He heard a lot of chirping and singing in the cellar, went down

expecting to find a canary, and there he saw Minnie, trilling away her blues like a prima donna.

The curator was fond of animals—and not averse to a gold-mine when he saw one—so he rescued Minnie from her cellar, and wrote to the broadcasting people about her. They just wouldn't believe at first, but when a couple of the boys went round, oozing incredulity, Minnie sang her way right into their hard hearts, and they arranged a nation-wide broadcast for the world's one and only singing mouse.

When the fateful time arrived Minnie not only obliged the "mike" with a cheerful little earful, but she coughed up an encore that brought in a record fan-mail. Her owner declares that Minnie must now be insured—there are so many nasty old cats about who envy her!

### Are You An Aerial

THE theory that each of us is a wireless station in himself has often been tentatively mentioned, but now it seems that a French investigator has found definite scientific corroboration.

He has been working on therapy problems and has found that the electro-magnetic radiations of the normal human body correspond with a wavelength of thirty or so millimetres. Human wavelengths appear to be affected by health, but whether poor health alters the frequency, or a change in frequency causes poor health, is not known.

## BOLTON WANDERERS

Northern, February 11th

Tom Cragg, Manchester sports writer, is to broadcast on February 11th a talk about another of those five "Northern Football Pioneers" which helped to form the League in 1888. This time, he is to talk about Bolton Wanderers—the only club which has so far won a Wembley Cup Final three times. The club was formed in 1874, originally in connection with Christ Church School, Bolton. It will be remembered that Bolton's first victory at Wembley was on the occasion of the first Cup Final ever held there—the famous Final of 1923, when a quarter of a million people attempted to fit themselves into a space designed to hold only half their number.

In connection with human wavelengths, my friend "Romeo" raises the interesting question of whether the solar plexus is the vital spot. So far as I can learn the particular organs have no special significance, but the body behaves much like any other radiator, and therefore the maximum effect is noted "amidships," where current-flow is at its maximum.

### Tragedy of an Announcer

MORE than once I have referred in these Notes to Herr Scherz, the world's first announcer. He began making friends with the microphone audience thirty-six years ago. This was before wireless telephony was known, when he was in charge of the announcements at the Budapest relay station, which operated a linked programmes-by-telephone service from the Opera House.

Later, when broadcasting as we know it came along, he was obviously the best man for No. 1 announcer of Budapest, and he became a great favourite with his radio audience. Then came tragedy.

After a severe illness he lost his voice, and all the specialists failed to restore it, so he resigned his announcership and became the station librarian. He always hoped to have his voice restored, but now it is stilled for ever. Rest in peace, old friend. Your niche in history is assured.

### My Stars

YOU would think that astronomers would have quite enough to do in keeping an eye on Mars, Jupiter & Co., without bothering about television, wouldn't



you? But as a matter of fact astronomical eyes are being reluctantly unglued from big telescopes all the world over, for the star-gazers are realising that they ought to have kept an eye on television from the

first. It is right up their street.

The televisionary takes a glimmer of light, amplifies it, and then throws it (via Alexandra Palace, etc.) on to the screen. Astronomers also start with a glimmer of light, but they never thought of high amplification until television showed them how. The world's biggest telescope is a 100-incher, and for some years more the astronomers will be working on a 200-incher, on which all hopes of heavenly investigators were founded. It may be that, before it is ready, television technique will have done more for astronomy than was ever hoped of the new giant instrument.

### Station and Wavelength Shuffle

SO much choppee-change has been talked about recently that a plain statement of the B.B.C.'s 1937 intentions will clear the air. Here's the position in a nutshell:

In July next the Scottish National will join London and North Nationals on 261.1 metres, leaving the 285.7-metre wavelength free for (temporary) use by Washford Cross. The West Regional programme will then go out on this wavelength, leaving 373 metres free for use as a Welsh Regional programme.

The South Coast will later have its high-powered programme on 285.7 metres from the proposed Start Point station, replacing Plymouth and Bournemouth. Another new station, of medium power (location

not yet decided) will bag the old Bourne-mouth-Plymouth wavelength (203.5 metres) to serve Bristol and parts of North Devon and Somerset.

## STRANGE TO RELATE

National, February 11th

"Strange to Relate" continues to arouse the greatest interest among listeners. Each programme is the cue for a fresh stream of letters with personal experiences for the series. Coincidental meetings and articles lost and found after a lapse of time have, however, outworn their welcome, and the producer is only paying attention to items of recent or long-past history that seem to suggest themselves as suitable for dramatisation. The two Unknown Reporters appear again on February 11th with unusual information about one of London's well-known buildings, the deeper-voiced one of the two having recovered from his bout of mince-pies in the Christmas edition. The lives of seafarers seem to provide a veritable "widow's cruse" of material suitable for such a programme, so that it is not surprising to hear that there will probably be another incident of the Atlantic in the next edition.

From February 1st the new Beaumaris station takes the same wavelength (373 metres) and programme as the Regional at Washford. I think that's all. Oh, no! I've remembered that just to elucidate matters the B.B.C. has decided to call the Beaumaris station Penmon. They would, wouldn't they?

### Don't Shoot

RECENT motoring activities of the C.I.D. (Criminal Investigation Department) at Scotland Yard have apparently led to a little misunderstanding. The facts are that officers have been inspecting a Chrysler car specially fitted with windows 2 in. thick—in fact, bullet-proof. They also inspected a special radio-equipped Hillman car, having wireless telephony apparatus.

These are the facts. There is no truth in the statement that all the police wireless cars are now to be fitted with bomb-resistors and bullet-diverters; dash it all, they are not such a nuisance as to need all that!

### Czechoslovakia Marches On

SINCE radio was introduced into Czechoslovakia there has been no check-ing nor slovak-ing in the rate of its progress.

The year 1937 is to be no exception, for the Bratislava station is to have a big brother in the neighbouring village of Neutra; and as the young fellow will start off with 100-kw., our old friend Bratislava will be relegated to marking time and light local duties.

Another 100-kilowatt will rise from the ashes of the old Brno station, which is due for replacement. (It's a thousand pities that the new station is not in some other town, for the name Brno is a perpetual plum in the mouth.)

What's more, they say the Czechoslovakians are going in for television, too. Remember the travel posters showing the native gazelles, with hands on hips? We must save hard for television, chaps. **ARIEL.**



# SOME UNUSUAL AERIALS

THERE is, perhaps, no other radio device which is so accommodating and versatile in nature as that ether energy collecting system which we designate by the term "aerial."

It is owing to the fact that the conventional types of aerial are three in number (i.e., the outdoor, the indoor, and the frame aerial), that many constructors are apt to forget that quite a number of other devices can be used for the purpose of picking up transmitted signals and of conveying them to the receiver. This article describes just a few of these curious types of aerials, in the hope of interesting the man who wishes to carry out a number of radio experiments, and with the absolute minimum of apparatus.

These aerial types are practical ones, and a very considerable number of fascinating experiments can be conducted with them.

Bedstead aerials in which the aerial lead of the set is connected to a metal bedstead or wire mattress are well known. Quite an interesting little variation of this principle, however, is that which we may conveniently term the "rug" aerial. In this device, which is illustrated at Fig. 1, a length of well-insulated wire is threaded through the edges of a large bedroom rug or carpet. One end of the wire is left free, whilst the other is taken to the aerial terminal of the set.

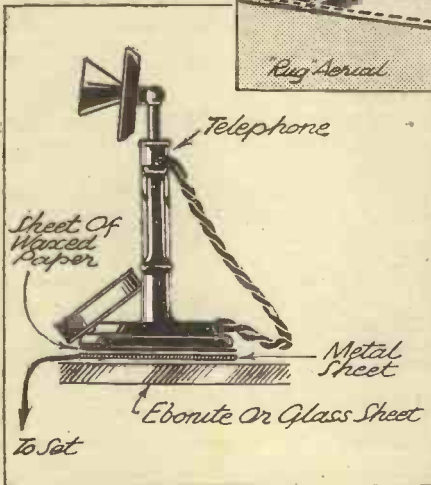


Fig. 2. Not a particularly effective scheme, but it does work!

*Amusing experiments that can be made with very little preparation and without any costly equipment*

## DISGUISED BY THE RUG

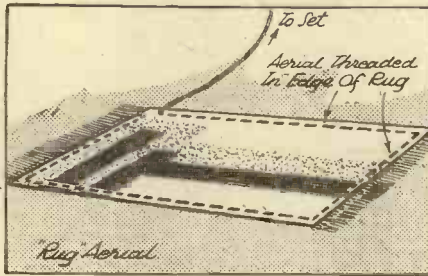


Fig. 1. Here's something which you may not have thought of.

certainly be put out of tune by such a procedure. However, apart from this, no other harm is likely to accrue to a piano so used. Nevertheless, only old and disused instruments should be

Another type of domestic aerial which is quite a novel affair is the piano aerial.

Many domestic pianos are long suffering instruments, and in these days of wireless many of them seem merely to fulfil the function of providing a convenient stand for flower-pots, photo-frames, and the other infinitely varied and multitudinous knick-knacks of our national domesticity.

Now, if you have such a Victorian relic whose days of "Harmonious Blacksmith" variations and "Maiden's Prayer" have long passed, why not put it to a really up-to-date use? The strings of a piano will very often provide quite an interesting receiving aerial.

### Directional Properties

In carrying out experiments with the piano aerial, it must be borne in mind that such an aerial has very directive properties. It is, in fact, a sort of large frame aerial. Thus the position of the piano in the room will have a very great influence on the results obtained from the use of the aerial.

Naturally, we do not advocate the converting of any good piano into an experimental aerial of this type. It is only in those instances in which a piano of the "old crock" type is available that this modern role for it is suggested. A good piano would



Fig. 3. How wire fences with wooden posts can be utilised.

utilised in this fashion, if only to be on the safe side.

As a final example of indoor devices which may on occasion be brought into service as radio aerials, we may deal with the "telephone aerial." This, as the diagram (Fig. 2) indicates, is very readily fixed up. A sheet of metal is laid flat upon a sheet of glass or ebonite, and a lead is

taken from the metal sheet to the aerial terminal of the receiving set. On top of the metal sheet is placed a sheet of thin waxed paper, and the telephone instrument is allowed to rest upon this. Signals are often far from being strong by this mode of reception, but anybody possessing a telephone on the premises will find the experiment of interest, for it illustrates the fact that an ordinary house telephone line can pick up ether energy and transmit it to a rectifying circuit by the simple capacity arrangement comprising the metal sheet and the waxed paper upon which the telephone instrument rests.

### Using a Tree

Turning now to a number of curious and out-of-the-way outdoor aerials, let us consider, first of all, the "tree aerial." That the majority of tall trees are able to absorb very considerable amounts of radio energy is a fact which has been known for at least twenty years. Working on this fact, Major George O. Squier, of the American Army Signal Corps, successfully utilised trees for the purpose of picking up electro-magnetic waves. These experiments were carried out a considerable number of years before broadcasting began. However, owing to the inefficiency of the tree aerial, little has been heard of it since. Nevertheless, no keen amateur should miss taking an opportunity of conducting a few experiments with natural aerials of this type.

The apparatus required is simple. It consists of a stout rod of brass, steel, or copper, and—a tree (the taller the tree the better).

The tree aerial is fitted up simply by driving the metal rod into the trunk of the tree at a distance of about a foot or two from the ground. A lead from the end of the rod is then taken to the aerial terminal of the receiver. For the earth connection an ordinary metal stake driven into the ground will suffice; or, on the other hand, the earth connection can be made by driving a metal rod into a neighbouring tree, whilst in some cases the set may be made to function without any direct earth connection at all.

### Choose a Tree Which is Isolated

Despite the fact that the trunk of the tree provides a direct earth path for the electric waves picked up, some of the collected energy will flow into the receiving set, and if the latter instrument is suitably sensitive, reception will be obtained. Preferably, the tree selected for these experiments should not be situated in a wood or near any tall building. It should stand by itself more or less in the middle of a field. The driving of the metal rod into the trunk will

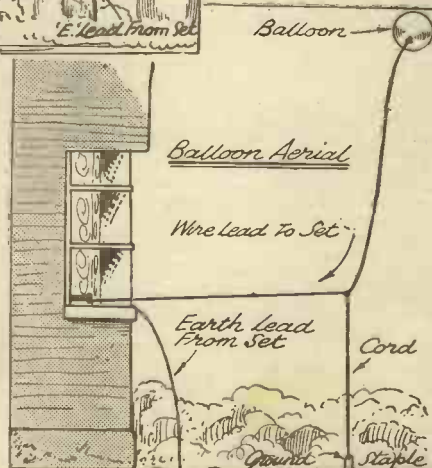


Fig. 4. A very novel aerial is illustrated in this figure.

(Continued overleaf.)

## SOME UNUSUAL AERIALS

(Continued from previous page.)

do little harm to the tree, provided that it is a fully grown one, and that after the rod has been withdrawn the hole in the tree-trunk is stopped up with a little clay.

Enthusiasts would do well to conduct a few experiments in the utilisation of wire fences and railings as aerials. In many cases

### HELD BY THE WIND

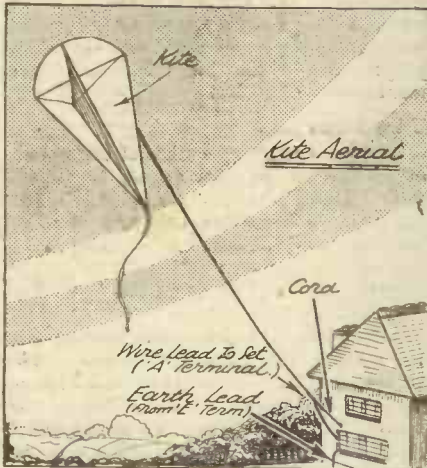


Fig. 5. Marconi conducted his first transatlantic experiments with a kite aerial.

a fence running along the side of a field will be found to consist of a series of parallel wires secured to wooden posts. Hence the insulation of these wires in dry weather is fairly good, and they may be brought into service as an improvised receiving aerial in the manner depicted at Fig. 3.

Fig. 4 also shows another type of improvised outdoor aerial. This is the balloon aerial. It consists of a balloon filled with hydrogen or coal gas, to the end of which is attached a length of No. 24 or 28 D.C.C. wire. When released the balloon rises in the air, and is held captive at any distance above the ground by the aerial wire. This type of aerial is capable of affording really strong signals.

### For Portable Sets

Still another type of aerial (illustrated in Fig. 5) is the kite aerial, which, as its name suggests, consists of a kite flown in the usual manner. The kite, however, is held captive by wire instead of by the more usual string or twine.

Lastly, a curious form of aerial from which good results are said to have been obtained in portable set working is the umbrella aerial depicted in Fig. 6. It consists of an old umbrella to each of the metal stays of which is attached a piece of wire. Near the handle of the umbrella is placed a block of wood, and the wire leads from the umbrella stays are threaded through holes in this wooden block, afterwards being all joined together to form a down lead. The umbrella is then mounted on the top of a pole, or

upon the branch of a tree, and the down lead is taken to the receiving set underneath. In conclusion, however, we must add that we have had no experience with this suggested type of aerial; but, nevertheless, its construction and utilisation will form the subject of an interesting experiment for the keen listener.

### A NOVEL ARRANGEMENT

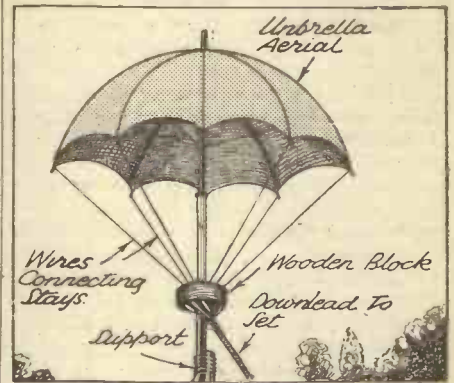


Fig. 6. An old umbrella adapted for use as an aerial.

Doubtless many other ingenious ideas with regard to objects that can be used as aerials will occur to the reader, and many an amusing and instructive hour can be spent with a small but efficient portable receiver, some wire, and, more important still, some fine weather.

IT is only just over ten years since we have had loudspeakers for our radio sets that could really be called by that name. Before 1926 there was little enough to provide us with music that could be heard by everybody in the room. Ear-phones with trumpets on them—that was the class of thing to which we all listened, and which, I must admit, we thought truly wonderful.

If we heard the same instruments now we should run from the room with our hands over our ears. Tinkling tinniness, scraping diaphragms, all middle notes with almost complete absence of top, and nothing whatever below about 150 cycles.

But the loudspeaker had arrived and we were enthusiastic. Radio had made a great step forward; we had been able to discard the uncomfortable earphone, with its ghastly isolation. We could gather round the speaker as a family and enjoy all the jokes—and the fat stock prices—together.



The Pye "Match-All" unit for extension speakers.

Gradually the speaker developed, and with it the receiver itself. Grid bias came into general use, and the quality of reproduction went up 100 per cent. Over the merits of resistance coupling and transformer coupling were fought great battles, while anode bend and leaky grid rectification split many a friendship among budding home constructors.

The superhet came, disappeared for a few years, and then returned. The screen-grid valve arrived, dealing neutrodyne systems a death blow for which we were unfeignedly thankful. The output pentode came, and then—if my memory is right—burst on the world in general, and the home constructor in particular, the fact that for many years he had been connecting up his loudspeaker all wrong.

He had been joyfully connecting it to the output terminals of the set, regardless of the type of valve he had in the output valve sockets. The arrival of the pentode made him sit up and think. That type of valve could not be put into the output stage of the set, connected up to the same old loud-speaker and expected to work right away. It simply would not; you had to have some sort of a transformer, a new fangled affair called a matching transformer, or else a tapped choke thing.

And so to our home constructor minds came the

## THOSE EXTENSION SPEAKERS

The need for correct matching

By K. D. ROGERS

realisation that the valve load must be adjusted so that the speaker and valve are matched. We learned that if the load was wrong then the quality would be wrong, and the strength of the output would suffer.

So every speaker was provided with a special transformer, for moving-coil speakers had taken the place of the old horn types and the moving-armature variety was fast going.

We learned to match our speakers and sets. The carefully thought-out transformers which the speaker manufacturers gave us on their instruments allowed us to do this job quite easily.

And then somebody said we ought to have a speaker in every room. Worked off the main set and so connected that we could switch them off or on singly or all at a time. Good, we said, we will. Give us the speakers and we will connect them to our home-made sets and to the commercial receivers we are using. But you will have to tell us how to do it.

Easy, they said. Just connect them in parallel. We did, and we did not like the results. The extension speaker began to get a bad name. Then others came along and said that we had forgotten all we ever knew about matching, and it was our own fault that we did not like the speakers. They should be matched to the output valve in the set and to the speaker that was normally connected to the set.

To the rescue of those who are in the doldrums of matching, let me introduce the Pye "Match-All" extension speaker link. It is a neat little box with—but I must not tell you what is inside—with a number of terminals. It allows you to connect your extension speaker to any set having any sort of speaker inside it. And it provides the power for you to match the speakers together beautifully.

You connect the box to the set, placing it close to the set and then connect the extension speaker

leads to the other set of terminals on the "Match-All" box. A very clear set of instructions is provided so that you can hardly go wrong in the connecting of the speaker link, there being seven different ways in which the link can be connected, so that very accurate matching of any ordinary speaker is provided.

In use I found the link very good indeed. It took but a few seconds to connect it in circuit between the set, and the extension speaker and the matching was certainly excellent.

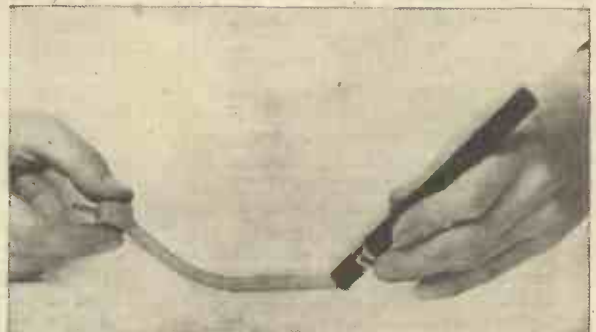
Pye Radio certainly has some good ideas. And that speaker link is not the only one that has come from their factory recently. Have you seen that natty portable aerial they have produced? No? Then you should: It is illustrated here.

Just like a large fountain pen, it fits into the waistcoat pocket. On one end is a pin, for insertion into the normal socket provided on some sets for the aerial plug. It is advised that the sets with which the aerial is to be used should be fitted with such a socket.

A slight pull on the other end of the "pen"—after unscrewing the top—and a spiral aerial appears. This can be stretched out to about 14 feet and hung anywhere convenient. When you have finished you merely detach the aerial and, walking towards the set with the "pen" in your hand you allow the spiral to coil itself up again inside the barrel of the "pen." Then the top is screwed on, the pin pulled out of the aerial socket on the set, and the whole aerial goes back into your waistcoat pocket.

A novel, useful and extremely efficient idea. And the cost? Just half-a-crown.

### A NOVEL PORTABLE AERIAL



Another Pye component—a novel aerial which can be attached to any set in a moment. When not in use, it slips into the waistcoat pocket after the style of a fountain pen.

# MIXING BATTERY ACID

*Some Valuable Hints on a Subject of Interest to all Radio Enthusiasts*

**T**HE question of the correct mixing of acid for an accumulator is a very important one, for the wrong strength of acid, or the use of hard tap water instead of distilled water, may result in the battery being ruined, or else in its life being seriously reduced.

If you have in your neighbourhood, at a handy distance, a distributor of one of the special brands of accumulator acid, the problem is solved for you, for this acid is ready mixed for pouring into your battery.

### Use the Right Materials

Otherwise you will have to mix up your own acid, and there are certain precautions to be observed in carrying out this process.

Firstly, you must have the right materials to begin with. These are pure concentrated sulphuric acid, obtainable from a chemist at about 3d. an ounce, and ordinary distilled water.

Under no circumstances, except those of extreme urgency, should hard tap water be used in an accumulator, for it contains impurities which will give rise to trouble sooner or later.

Secondly, the vessel used to mix the acid must be acid-resisting. A tin, obviously, must not be used. Either glass, china or enamel may be used, but if an enamel vessel is employed be sure that it is not chipped.

### A Word of Warning

Thirdly—and this is most important—always add the acid to the water, *never* do the reverse, or there may be serious consequences.

Sulphuric acid does not just mix with water or dissolve in water as would methylated spirits or salt respectively. Actually, it combines with it chemically, and in doing so a considerable amount of heat is generated. Sulphuric acid, as a matter of fact, has a very great affinity for water, and combines with it rather violently, especially if there is only a small amount of water and a lot of acid. So if water is added to acid the heat generated may be sufficient to make the acid boil violently, and hot acid may be projected on to hands or face.

### Deciding the Density

If, however, the acid is poured slowly into the water, the large bulk of water (on account of the proportions used), and the fact that the acid is added to the water, does not give rise to a sudden increase in temperature. At the same time, the water will get quite hot—hotter, indeed, than the hand can bear—so the mixing, under any circumstances, should be done slowly.

It is important that the acid and water be mixed in the correct proportions in order to produce the desired density "electrolyte," as the dilute acid is known. This value varies with different types and makes of battery, and the label on an accumulator should always be consulted before starting to mix your acid.

If you have a hydrometer it is a simple matter to read off the density of the acid after you have mixed it. Make sure, how-

ever, that you take your readings after the acid has been allowed to cool down, for just after mixing, when the electrolyte is still very hot, the density reading you obtain will be much lower than it should be. An approximate correction is given by reckoning a decrease of .001 in density for every 3 degrees rise in temperature, the normal temperature at which the density should be read being 15 degrees Centigrade. Without a hydrometer you will have to mix acid and water by measurement, and the following proportions give you the densities tabulated against them.

### The Proportions

Parts Water.	Parts Acid.	S.G. of Elec.
4½	1	1.200
3¾	1	1.230
3½	1	1.260

From these figures it will be seen that density of concentrated brimstone sulphuric acid is taken as being approximately 2.375, and this will enable you to work out your own proportions.

Remember that the more acid you have the denser the solution, and vice-versa. When making the final adjustments to the electrolyte to get it exactly the right density, add acid or water (as may be required) very gradually, and stir it well with a glass rod after each addition before taking a reading, so as to make sure that the solution is uniform.

## WHEN CLEANING AN ACCUMULATOR

**W**HEN removing the acid from an accumulator which it is desired to clean out thoroughly, it is sometimes difficult, owing to the peculiar construction of the accumulator, to remove the last few drops of liquid. Thus it is that in such instances there is often left lying at the bottom of the accumulator a layer of liquid a quarter and, occasionally, even half an inch in depth. This liquid contains most of the accumulator sediment. Hence, it is always desirable that it should be removed more or less completely when cleaning out the battery thoroughly.

### A Simple Method

About the best way of effecting the complete removal of this "sediment layer" of liquid consists in lowering a thin rubber tube into the accumulator and by very carefully sucking up the liquid by dint of applying the mouth to the outer end of the tube (the very greatest care being taken not to suck any of the acid into the mouth), or, better still, by attaching a hollow rubber ball, as seen in the illustration, to the outer end of the tube and by squeezing this. After the air has been expelled from the rubber ball and tube the liquid at the bottom of the accumulator will rush up into it and can thus be effectively removed.



How the tube is inserted through the vent hole of the cell to suck the acid out.

The rubber ball and tube seen in the photograph were actually taken from the shutter of an old camera. Any type of narrow tubing, however, will suffice for the purpose, and for the necessary rubber ball a small rubber nose syringe will serve the purpose excellently, since the rubber tubing may be attached to its pointed nozzle very readily. **J. F. S.**

## FORTY THOUSAND WORDS ON ONE TEST MATCH

How England Hears the News

**S**OME indication of the wonders of modern communications is given by the speed with which the Test news is coming through to the public in this country.

Special arrangements have been made by Cable and Wireless Limited to ensure the utmost dispatch, and urgent messages have been received within two minutes of their dispatch from Australia.

There are direct telegraph lines between the various Test Grounds and the Cable and Wireless Offices in Australia, and the fall of a wicket is known in England almost as soon as the defeated batsman arrives back at the pavilion.

### By Cable and Beam Radio

Many of the messages arrive from Australia over the world's longest cable, which crosses the Pacific Ocean between Australia and Canada, a distance of some 3,457 nautical miles, during portions of which the cable lies at a depth of over 3½ miles.

Other Test cables come over the normal London-Australia route via the Straits, the Red Sea and the Mediterranean, while messages have also been sent via the Cape and Madeira cables and on the direct Anglo-Australian Beam Wireless Service.

Some idea of the public interest in the news can be gauged from the fact that during the first Test at Brisbane 40,000 words were telegraphed to London alone.

## MORE DANCE BROADCASTS

Henry Hall and the B.B.C. Dance Orchestra are now giving a half-hour programme each Saturday at 11.45 a.m. on the Regional wavelength. This is additional to the Friday day-time dance broadcasts given in the National programme by the B.B.C. Dance Orchestra.

# RANDOM RADIO REFLECTIONS

By Victor King

TRANSMITTING ELECTRICAL ENERGY WITHOUT WIRES :: IGNITING EXPLOSIVES AT A DISTANCE  
:: A WORRIED INVENTOR AND THE SEQUEL

## POWER BY RADIO

I NOTE that a popular astrologer has predicted that before very long a system for sending power by radio will be discovered. Well, I'm not a reader of the stars, but I predict that this prediction won't come right. At least, I give it as my opinion that no economical system of radio power distribution will soon, if ever, be discovered.

And I don't know if we want it, any more than we want systems of domestic gas or water distribution without pipes. After all, one of the essentials of distribution is control. And, leaving you to work that one out, let me tell you about a secret demonstration I saw some years back.

An Italian gentleman claimed to be able to transmit the power from a 6-volt accumulator to a small electrically-driven boat by means of "focused magneto-power beams." Together with a bunch of other interested folk, I turned out at five o'clock one spring morning to see the thing work on a pond in the north-eastern outskirts of London.

"Eef he works wit' dis leetle engines, he works wit' da beeg sheeps, yes?"

We all agreed that the idea ought to be applicable to the "beeg sheeps" if it proved successful wit' da leetle sheep.

First, we examined the small vessel very closely. It was about four feet long, and seemed to contain nothing but a tiny electric motor and a lot of little coils connected to a long, extended coil slung between two masts. There was no concealed battery. We tested for that with a delicate galvanometer, using a little idea of my own.

We also examined the "transmitter"—an accumulator of a quite ordinary type, more coils and a switch. Then one of the Italian gentleman's assistants (there were three of them) carefully placed the boat in the water and joined his compatriots in a little huddle round the "transmitter."

Next, they all stood back a bit, leaving only the proud inventor at the point of control with his hand dramatically poised over the switch.

"I pressa heem! Cleek!"

We all stared intently at the little vessel, rocking gently at the edge of the water.

"He go!" shouted the Italian; and, sure enough, it very slowly moved outwards into the pond.

It travelled about twenty feet at a speed of two miles per hour or so, then stopped. Again the assistants and their maestro went into a huddle over the transmitter, and, after a few minutes of poking about, it was announced regretfully that there had been a slight breakdown.

"He go, yes?" said the Italian gentleman, with glinting, hopeful eyes.

"The electricity travels through the air, is caught by that coil affair between the masts, drives the electric motor and thus turns the propeller?" I asked.

"Si! Si!"

But when they'd got the boat ashore again, I pointed out to the other experts that the bit of match-stick I'd surreptitiously stuck into the armature of the motor was still successfully jamming it!

Yes, I'd guessed it was all a fake, but I don't know to this day quite how it was worked, and your guess here is as good as mine.

## A "Destructive Ray"

I also saw a demonstration of that "destructive ray" due to another Italian gentleman. You may have read about it at the time. This chap claimed to be able to ignite explosives at a distance. A fine demonstration, that. He sent a small boat out and, when it was at a distance of some two hundred yards, he pressed a button on his transmitter (which was no larger than a biscuit box) and, boom! The boat suddenly blew to bits. But we do know exactly how he worked this stunt. There was a hole in the bottom of the thing which was stopped up by means of a lump of either sugar or salt. When the water permeated through this, it contacted some sodium, which at once burst into flame and ignited the explosive. Of course, the inventor knew to within a few seconds when that would happen, and so was able to press his key at the right moment.

Misplaced ingenuity! Why do these fake inventors fake? What is their motive? They must surely know that they could never expect to sell their fakes. Or do they? Or is it just to satisfy a craving for notoriety?

## He Struck a Snag

There is a third alternative, and I can give you a case to prove it, though I can't, in fairness, give names. Three years ago, a young man got into touch with me. He was in a terrible stew. Quite sincerely, he had thought he'd hit upon a very valuable idea. He communicated his enthusiasm to a manufacturer of—sorry, I forgot; I mustn't give a direct clue. Anyway, this old boy advanced a



Charming Suzanne McClay smiles at the Marconi-E.M.I. Emitron camera during her television programme from the Alexandra Palace. Miss McClay sings French and English songs.

large sum of money to this young man, so that he could develop and produce a finished model.

But the initial, practical experiments revealed a snag. A huge snag. A devastating snag. Could I, asked the young inventor tearfully, get him out of the jamb? He'd spent a lot of the money advanced, and hadn't the moral courage to tell his backer that the idea was a dud. Could I help him to surmount the difficulty?

"In short," I said, "you want me to invent the idea all over again for you from scratch." And that is what it really amounted to, but it was a quite hopeless task. It just couldn't be done. I wanted to help the young man, and so, after giving the whole matter considerable thought, this is what I finally suggested.

"The whole scheme is based on false premises," I said. "It's like trying to build a stone castle with wooden bricks. To succeed, you'd first have to discover something fundamental, like the transmutation of matter. But that you've thought of the idea at all proves you, at least, have imagination. That you've managed to get backing seems to prove that you have enthusiasm. Right! Go away and invent something else, always making sure you think in terms of things you know. With that imagination, that enthusiasm you displayed in this other and abortive venture, plus the stimulation of a desire to justify the faith of your backer, scheme up something really hot and good. Give yourself a month of intensive thinking, and if you fail, tell the old gent all about it. He won't eat you—probably. After all, he must have regarded the advancement of his money as a pure speculation; and, anyway, you haven't spent all of it. If you succeed, still tell him the truth—that the first idea flopped out in practice, but you've brewed something else."

Well, that young chap followed my advice, and he thought and thought and thought, and then he laughed and laughed and laughed. He's probably still laughing,

(Please turn to page 586.)



# ON THE

# SHORT WAVES



## SUPERHET LAYOUT

Some hints on the construction of a de-luxe set.

By W. L. S.

THIS page, which is usually devoted to some topic connected with the design of short-wave receivers, has not often been given up to the superhet. Acknowledged to be the finest of all short-wave receivers for telephony, the superhet seems to have been continually growing in complexity, always keeping just a little way ahead of the home-constructor who has been chasing it—always “in the next field.”

It's time we stopped this and got down to brass tacks, so let's try to find out why the superhet has stumped so many. I think the whole thing can be boiled down to complexity and that matter of layout.

### Layout Importance

Anyone with a little practical experience of short waves can lay out, on his own baseboard, a jolly good two- or three-valve receiver. He may be able to carry a superhet circuit in his head—not a very difficult matter, after all—but when he comes to translating it into a three-dimensional layout, he finds it appallingly complicated. If he has the courage to go on and to try it, he generally finds the whole thing so hopelessly unstable and “touchy” that he gets thoroughly fed up with himself and drops the whole business.

The fact of the matter is that it's no good thinking of a modern superhet in terms of a panel and baseboard, with unscreened coils and two nice tuning condensers in the front. With the high-efficiency valves that we have nowadays, not to mention the appallingly efficient air-cored intermediate-frequency transformers, it is a man's job to stabilise a superhet unless the layout is carefully planned and just right.

### Keeping Down the Wiring

Let's think in terms of a chassis from now onwards—a metal chassis with a turn-down of about two inches, and all important connections made underneath. Several modern I.F. transformers are made specially for chassis mounting. They are bolted on to the chassis from the top, automatically earthing their cases, and terminals or leads protrude through on the underside, conveniently near the valve-holders or other components to which they have to be connected.

Chassis construction reduces this part

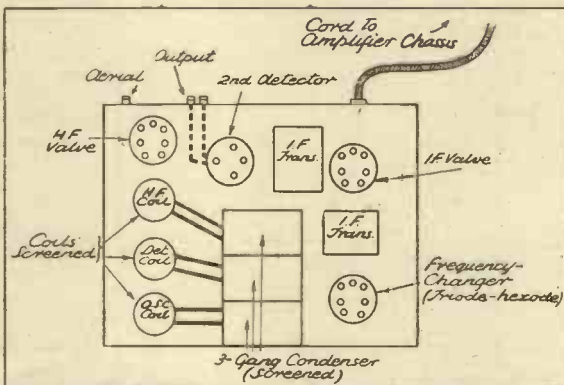
of the wiring by more than half. The short-wave coils, too, can be fitted into chassis-type valve-holders, and need have no above-board connections at all.

The valves should be given screened leads from their top terminals. In short, the layout should be that of a good modern broadcast receiver, “only more so.” And so as not to make our superhet chassis an unwieldy contrivance, I suggest that we use two of it!

The H.F. stage, frequency-changer, I.F. and second detector can easily be mounted

At this stage I'm not going into details about the circuit. Suffice it to say that a perfectly straightforward H.F. stage (using a pentode), followed by a triode-hexode, makes a really fine signal-frequency unit. The I.F. stage is nothing more than an ordinary H.F. amplifier working at a fixed frequency, and should be designed and treated as such. The second detector, preferably working on anode-bend, offers no snags. In fact, the only thing that can trip one up is the general layout and the risk of instability if it is bad.

## H.F. CHASSIS ARRANGEMENT



These two diagrams are W. L. S.'s suggestion for a superhet made in two parts, viz. an H.F. chassis and a separate amplifier and power-pack.

on one chassis of reasonable size, and the other can carry the power-pack and a lusty output stage—possibly a pair of biggish valves in push-pull.

The two diagrams on this page show, rather roughly, my scheme for such a pair of chassis. The two units, together, should make a short-wave telephony receiver *de luxe*.

One of the major snags about short-wave superhets is the coils. If we can't buy a three-coil, three-condenser unit, we have to make the best of a bad job with the latter half only. That means using three separate sets of coils, and makes wave-changing a bit of a lumbering business. But the ingenious reader who really means to make a job of things will find some way of coupling a set of three coils together so that they may be inserted in one block with the minimum waste of time and trouble.

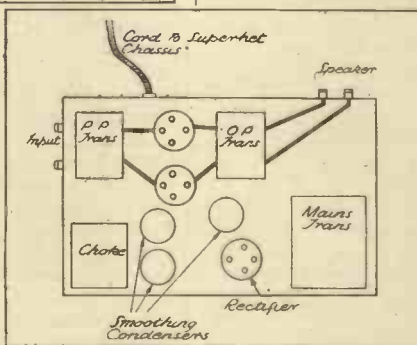
### Simplicity of Tuning

Get a superhet going at all well and you will be amazed at the ease of tuning, the strength of the better known stations, and the air of solid comfort about the operation of the set.

Now I admit that, compared with the simple but effective little short-wave sets that have been all the rage for many years, and, for that matter, still are, this is a big job and a complicated one. If you want band-spreading you have another three-gang condenser to think about.

In fact, you have a rather bewildering array of parts to buy and to wire up. I do think, though—and I hope you will—that it is worth while. You will have a receiver that is free from the need for “fiddling.”

## AMPLIFIER & POWER-PACK



### Like Locals

You will be able to treat the better known short-wave stations as if they were locals, using the speaker all the time, and you will have shifted your short-wave recep-

tion out of the “kitchen-table” or “work-bench” category into the “drawing-room” department.

Needless to say, if such a prospect doesn't appeal to you (if, in other words, you are the DX-hound I wrote about a few weeks ago), then don't do it. If it *does*, though, get down to it while the long winter evenings are still upon us, and, by way of encouragement, I'll go into further details about it next week, and mention a few practical points that have cropped up in the making of my own set, of which I have been thinking as I have written this page.

ON THE SHORT WAVES—Page 2

# POINTS from the POST-BAG

## W. L. S. Replies to Correspondents

A NUMBER of readers, tuning round the 31-metre band in the hope of hearing the Test Match reports direct, have been sold a large size in pups. They have heard the Test Match commentary, but it has been a relay from Daventry, putting it out for other parts of the Empire. Regarding the channel by which it comes from Australia to this country—well, there you have me!

One of the readers who raises this query—G. M., of Llanelly—says: "I have a three-pin all-waver. Do you think I should get Australia direct at loudspeaker strength on this set?" How should I know, G. M.? What particular breed of all-waver is it? Is it bad or good? What's your aerial like? What sort of a district for reception do you live in? Instead of answering your question, I've had to ask five more!

More queries on short-wave amateur transmission have been flocking in. I do hope that they were written before my last little outburst on the subject. Please turn back to the last two or three numbers, readers concerned. I really can't mention that "Guide" any more.

C. H. O. (Hull) is building a short-waver, and forwards his circuit with some queries. Seeing that these must be of pretty general interest, I am dealing with them "in public."

First, he wants to know the best voltage to use on the screen of an H.F. pentode—and can he obtain it by a resistance from his full supply of 120 volts? I always advise readers to stick to the valve makers' recommendations—most of them give the optimum voltage, and many show a network of resistances and decouplers for obtaining it. I suggest, however, that 60 volts, obtained from a "1:1" potentiometer across the H.T. supply, will do. Two 50,000-ohm resistances in series, with the screen connected to their common point, will do it.

On the anodes of the H.F. stage and the detector you should have, preferably, the full 120 and about 60 volts.

C. H. O. is worried because his layout means that the H.F. pentode will be upside-down or at an angle; he needn't be, because that won't matter at all. He also inquires about a potentiometer for controlling reaction, but as his circuit with a condenser is quite a nice one, I don't recommend the alteration.

Finally, he says that he understands that the values of resistance-coupling components to the last valve depend upon the preceding valve. Quite right—they do; but with a general purpose valve he won't be far wrong with an anode resistance of

50,000 or 100,000 ohms, a grid condenser of .005 mfd., and a grid-leak of 1 megohm.

K. L. W. (Ayr) writes as follows: "Noting that some of your readers were asking for blue-prints, I am enclosing a few, and hope you will forward them to any reader who would like to have them. I also have a number of 'P.W.'s' for 1932-33, and will gladly forward them to any reader who is willing to pay postage for same." The full address is K. L. Watt, 2, Burnfoot, Patna, Ayr, Scotland. The blue-prints (of varied and unbelievable assortment) are in my own drawer. Anyone interested should ask me for further particulars.

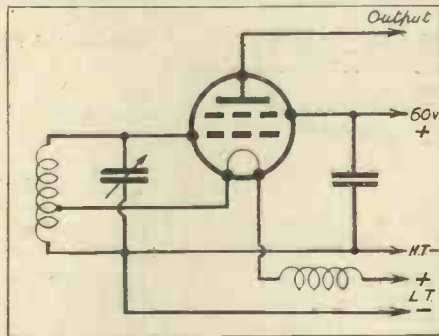
K. L. W. wants a design for a short-waver with a screened-grid detector, R.C. L.F. stage, and final transformer-coupled stage. He apparently believes in plenty of noise! I will try to evolve a good set on those lines for the "standard-baseboard" arrangement, which is starting off again shortly.

E. W. A. (Grays, Essex) tells me that he still uses a single-valve adaptor with two-pin plug-in coils. He has made some coils for the ultra-short waves, and has no trouble in receiving the Alexandra Palace

transmission on them. He makes no alteration either to his adaptor or aerial to do this. He is twenty-five miles from A.P.

I wonder how many readers still use two-pin plug-in coils? They used to

### FILAMENT-TAP SCHEME



A filament-tap circuit reproduced by W. L. S. in response to a query from F. R. M. (Manchester). On the right is the practical layout.

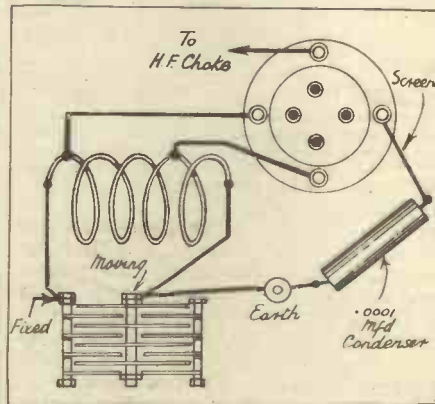
be tremendously popular, but the present cult of the compact four-pin coil (for which I am more or less responsible, I'm afraid) has ousted them. E. W. A. uses

coils of 1-in. diameter, soldered to suitable plugs for the two-pin holders; 3 turns grid and 4 turns reaction enable him to cover the television wavelengths, so I imagine that he would have no difficulty in getting his adaptor down to 5 metres.

The sketches on this page are reproduced in response to a query from F. R. M. (Manchester), who wanted to see a good layout for one of the various "filament-tap" circuits, often called "electron-coupled." One shows the circuit arrangement in its basic form, and I won't bother to explain its working, as I've done that so often.

The other sketch shows the nice kind of layout that can be evolved from it.

### HOW IT IS WIRED



# Short-Wave News

APPLICATIONS for the "P.W." DX Certificate have been flocking in at a goodly rate for the past few weeks, a number of readers having qualified for the award. As our first printing of these certificates is nearly exhausted, I discussed the matter with the Editor, and we finally agreed that it is time to put a "closing date" on applications for this proof of your efficiency as a short-wave operator.

We are going to replace it by something that is even more difficult to gain, and which will, in consequence, mean even more. Our plans are not yet fixed, but I can drop a hint by saying that I propose to divide up the world into a number of areas, and readers who can provide proof that they have received a station in each of those areas will be awarded something really nice in the way of a certificate.

### The "P.W." D.X. Certificate

It was in April, 1936, that we first drew up and announced the "P.W." DX Certificate in its present form. Accordingly we are going to withdraw it on April 30th, this year. All applications for this certificate must be received before that day; and if the supply of certificates is exhausted before then, "orders will be dealt with in strict rotation," as the advertisers say.

This decision, of course, makes the existing certificates even more valuable, since only a limited number of them have been issued, and they will be fairly "exclusive," even when the whole stock has been sent out.

To catch the eyes of readers who have not bothered to cast their eyes over the above, let me say, in capital letters: **IF YOU WANT YOUR DX CERTIFICATE, YOU MUST APPLY FOR IT BEFORE APRIL 30th, 1937.**

I have been listening a good deal this week, both on my own home-made "straight" receiver and on my excellent commercial all-waver, and it

seems to me that conditions are going to show some slight signs of falling off before long. They are still exceedingly good, but there has been more fading on some of the stations that used to be steady, and some of the weaker ones are still weaker.

The amateur bands, at times, reach a state which is dangerously near to coming under the title of "Dead." Once or twice I have found the 20-metre band completely blank at times when one would expect it to be lively.

All this may prove something or other, or it may not; but I think we are in for a spell of conditions which are poor, compared with the glorious times we have had recently.

W. L. S.

# TELEVISION TOPICS—Collected by A. S. Clark

A weekly feature which will keep the reader au fait with all the latest news and developments in television science. It will appeal alike to the newcomer to television and the advanced experimenter



A general view of the R.C.A. television transmitter in the Empire State Building, New York. The pipes near the ceiling are not connected with ventilation but with the feed system to the aerial.

## “TELEFRAMES” Items of general interest

WE learn that one television model receiver is to be made by Haleyon.

It will have 19 valves and employ a superhet circuit. The picture is to be 8 ins. by 7 ins., and the instrument design incorporates an all-wave sound receiver. At present no definite release date or price has been fixed.

With regard to Murphy television receivers, which readers will remember were dealt with and illustrated a while ago in these Topics, it is understood that models are to be available for the Coronation in May. No prices, at the time of writing, have been announced.

### FOCUSING THE SPOT

Users of experimental cathode-ray television apparatus should bear in mind that focusing of the spot, and therefore picture sharpness, is dependent on the ratios of the voltage on the electrodes of the tube. The voltage on the screen, which also controls picture brightness is thus partly responsible for focusing, and consequently an alteration in brightness should be followed by an adjustment of the voltage on other electrodes in order to keep focusing correct.

### WHICH SYSTEM?

It will be welcome news when the B.B.C. tells us which of the two systems of television is to be adopted at the Alexandra Palace. Little purpose, if any, can be served by extending the side by side trials, and the simplification to one system should enable the prices of receivers to be lowered.

Every little reduction in the price of television receivers helps, and this question of price is perhaps the biggest obstacle to rapid development of the science at the present time.

### SPECIAL MATERIAL

Television is a new and special form of entertainment, and, as such, deserves to have material specially written to suit its technique. The value of adapting material written for another form of entertainment will always be doubtful.

In view of this, the news of Mrs. Bissell Thomas and the play she wrote after seeing a television demonstration is very welcome.

### THEY MISS IT

We heard of some people the other day who have had a television receiver on extended trial, and which has now been removed. They said that in spite of the programmes lasting for only two hours a day, they missed them very much—

much more than they would miss their ordinary radioset. Which goes to show there may be more in the fascination of television than meets the eye.

### REMEMBER

Ordinary single rubber-covered flex of the inexpensive type is not suitable for the high voltages of television. Flex intended for high voltage work should always be employed.

### AMATEUR BOXING CONTEST

Amateur boxing is to provide television's first outside broadcast of a competitive event to-morrow, Thursday, when viewers will see contests in a tournament staged by the Alexandra Amateur Boxing Club in the Concert Hall of Alexandra Palace. Two important England v. Ireland matches are to be televised in the evening transmission. The first encounter is between F. J. Simpson, amateur light-weight champion of Great Britain for 1936 and Berlin Games representative, and Corporal T. Bonham, Irish Free State Army champion, 1936; and the second is between W. S. Pack and T. Byrne, the amateur welter-weight champions of Great Britain and Ireland respectively.

It is hoped that a commentary will be given by Harry Mallin, undefeated middle-weight champion of the world, who will be seated at the ring-side with Leslie Mitchell, the television announcer. From time to time viewers will have glimpses of the commentators and a section of the audience, which is expected to number at least 3,000.

### A G.E.C. CHASSIS



An interesting view of the complete chassis of a G.E.C. television receiver. The double time base is in the foreground.

## CATHODE-RAY TUBE RELEASES

WE are pleased to be able to give readers the details of new cathode-ray-tube releases on the following page. In the case of the Ferranti models, prices at the time of writing have not been fixed, but it is anticipated that they will vary between £8 and £15 according to size.

These tubes are stated to be of such a shape that they give an almost flat screen, and are given an external pressure test equal to three atmospheres. An internal coating of Acheson's Colloidal Graphite is affixed by a special Ferranti process to minimise reflection and remove any charges accumulating.

It will be noted that this tube has magnetic focusing as well as scanning. The following particulars refer specially to the 14-inch model. The limit of the beam current modulation is 0/250 microamps. Focusing ampere turns are 200/300. Scanning 10 m.a. for two 500-turn coils. This varies with the coil design, naturally. Grid-base cut off light 10/50 volts. Picture 10 ins. x 8 ins.

### Available to Special Order

The H.M.V. tubes, we understand, are available to special orders only, dealers not carrying stocks. All orders will be dealt with in strict rotation.

It will be noted that modulation volts are given from black to defocusing. The figure thus represents the number of signal volts required to be applied to change the picture from black right up through all shades of light to full white and beyond to the point where additional positive on the modulating anode begins to affect the electronic lens system formed by the different voltages on the succeeding anodes, resulting in the tube going out of focus.

Due to the magnetic deflection, there are no deflector electrodes in these tubes.

# TELEVISION TOPICS—Continued

## TELEVISION FOR BEGINNERS

G. Stevens discusses the question of building television receivers this week.

**T**HERE are quite a number of people who are surprised to find that their ordinary all-wave set will not do for television reception—in fact, there are some who think that as soon as they buy a tube and put it on to the receiver they will see pictures. If you have understood these articles, or the greater part of them, you will know better, but there are still some questions which remain to be answered.

### It Depends on You

In the first place you might say, "Can I build a television receiver?" The answer mainly depends on your capabilities as a constructor. There are a number of professional radio engineers who consider that the home constructor cannot build a television receiver, not because he is incapable or insufficiently experienced, but because the truing up and adjusting of a television receiver require apparatus which he has not got and which would be very expensive to obtain.

Take the simplest case of a cathode-ray tube which suddenly

develops loss of focus. It is simple to blame the tube, but supposing that the tube is checked by the makers and returned as O.K.

This means a systematic checking of the components to find where the volts have gone to, and the only means is to use an electrostatic voltmeter reading some thousands of volts—about £4.

It is certainly possible to ask a friendly dealer to oblige, but one never knows where it will stop. And then there is the ganging of the receiver and the initial tuning—an oscillator saves an enormous amount of time and trouble, but very few of us have oscillators on the shelf ready for service.

### By No Means Simple

This may sound very pessimistic, but it is not meant to be. It is only a warning that the construction of amateur television receivers is not quite so simple as the ordinary sets to which you have been accustomed, and unless you are prepared to see the thing through it is better to rely on someone who has the

necessary aids to help you in the construction and fitting up.

The receiver can be as simple or as elaborate as the corresponding broadcast receiver: it is a question of cost and locality. It is not desirable to start with an elaborate receiver if a simple one will do, for obvious reasons, and it is always as well to remember that the simpler the circuit the less the risk of anything obscure going wrong with it.

### What Do We Need?

After these solemn words of warning we might get down to considering ways and means. What do we require for a complete television set? Answer: One sound receiver (unless you prefer to watch in silence), one vision receiver, one scanning circuit, one cathode-ray tube, and two or three assorted H.T. units.

The sound receiver is the easiest of the lot, as it is of the ordinary short-wave receiver type with no elaborations beyond the special coils necessary to tune down to 7 metres. The power output from the Alexandra Palace is ample to enable the sound to be received within a radius of about 40 miles. It is the most risky thing of any to quote range figures, because as soon as a figure is given, up comes somebody and says, "I live forty-one and a half miles away and the sound is so loud that my speaker cone turned inside out when I tuned in."

On the other hand there is always the poor man writing from Hornsey to say that he can't hear the sound over the radio, but listens at his front door to the programme borne over the air!

Seriously, the variations in the quality and strength of short-wave reception are quite likely to give results like these absurdities, and the first thing to do is to glean information from people in your locality who have actually heard the transmission, and the closer they are to you the better.

### Using a Converter

Assuming you know that you will receive the sound signals at reasonable strength, there is no reason why you should not use an ordinary receiver with a special short-wave converter. It is considerably cheaper than the building of a special one, although it has one or two drawbacks.

For example, the sound will come from a different part of the room from the vision, unless you mount one on the other. Secondly, your receiver may not be of the "high-fidelity" type and you may not gain the full advantage of the increased frequency range of the short-wave sound transmission. But the idea is an excellent one and entails a minimum of expense and trouble.

The vision receiver is quite another thing, and we can leave that for another time.

## "HIS MASTER'S VOICE" EMISCOPE TUBES

Type		9 in.	12 in.
Heater	Volts	4	4
	Amps	1.3	1.3
Normal Operating Volts	Anode 3	3000	3000
	Anode 2	1000	1000
	Anode 1	300	300
	Grid Bias	24	24
	Modulation*	8	8
Max. Anode Volts**		6000	6000
Sensitivity	X Plates	(Not fitted, tubes intended for magnetic deflection)	
	Y Plates		
Type of Tube		Electrostatic focusing hexode.	
Capacities mmF.	G—E		
	C—E		
Modulation Sensitivity	mA/v.	25	25
Max. Input Power to Screen per sq cms.(Watts)		0.01 watts/ cms <sup>2</sup> .	0.01 watts/ cms <sup>2</sup> .
Screen Colour		White	White
Dimensions cms.	Diam. of Screen	8½ in.	11 in.
	Max. Diam.	9 in.	12 in.
	Max. Length	22½ in.	27½ in.
	Base	Side contact	Side contact
Price		11 Guineas	15 Guineas

\* Peak-to-peak volts between black and de-focusing.

\*\* Maximum voltage for A3 or A2 in 3— and 2— anode tubes

## FERRANTI CATHODE-RAY TUBES

Type		T10	T12	T15
Heater	Volts	2	2	2
	Amps.	1.5	1.5	1.5
Normal Operating Volts	Anode 1	4000	4000	4000
	Grid Bias	-50	-50	-50
	Modulation*	-20/-50	-20/-50	-20/-50
Maximum Anode Volts**		5000	5000	5000
Type of Tube		Magnetic focusing and deflection.		
Capacities mmF.	C—E	5.0 mmF.		
	C—E	Designed to run with cathode earthed.		
Modulation Sensitivity	mA/v.	1	1	1
Max. Input Power to Screen per sq. cm. (Watts)		.009	.007	.004 watts
Screen colour		Black and White.		
Dimensions cms.	Diam. of Screen Max. Diam. Max. Length	9 in.	11 in.	14 in.
		10 in.	12 in.	15 in.
		24 in.	24 in.	28 in.
Base		Standard 7-pin valve base, using only 4 pins (pins 3, 4, 5 and 7).		

\*Peak-to-peak volts between black and de-focusing

\*\*Maximum voltage for A3 or A2 in 3— and 2— anode tubes.

# GERMANY'S TELEVISION

Considerable progress has been made in German television since 1932, noteworthy developments being the opening of a telephone-television service between Berlin and Leipzig and the provision of public viewing halls in Berlin. A great fillip was given to the science during the Olympic Games of last year; when many of the events were televised for the benefit of those who could not attend the games.

**G**ERMANY'S first big step in television was the establishment throughout Berlin and its environs of twenty-five television receiving stations where visitors and citizens may view events taking place at the moment; and the second the first large telephone-television connection in the world, between Berlin and Leipzig, put into operation last year by the Reichspost.

Hitherto the German people have regarded television as a plaything of that rather privileged cult—scientists. With these actual demonstrations of the everyday use to which it may be put, however, radio stores throughout the country are being besieged by enthusiasts for information on when sets within their means will be manufactured.

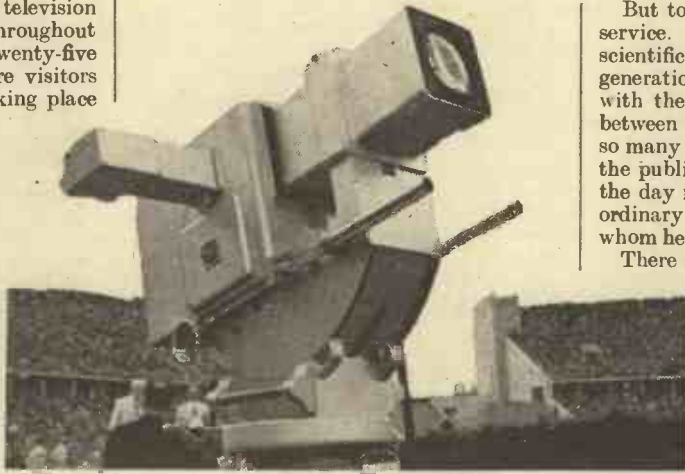
Germany has indeed made great strides in television since 1932 when the Reichspost erected a powerful ultra-short-wave transmitter in Berlin-Witzleben. Transmissions had been carried on there since 1929, but with the new transmitter their programmes showed a decided improvement. Two years later a second transmitter was built, making possible the synchronisation and transmission of the scene's accompanying sound.

Much of the German progress realised during the past year may be credited to the Olympic Games in Berlin. They gave television a handicap in its race for practical use that it ordinarily could not have commanded. In planning to make the XI Olympiad the biggest and most complete of all, Germany gave considerably more attention to the science of broadcasting sound and vision pictures than it otherwise would have warranted.

## Five Cameras Employed

The twenty-five television receiving stations were primarily established for the out-of-town and foreign visitors who, for one reason or another, could not attend the games. A most complete coverage of these events was given. Five huge iconoscopes were located throughout the Reich Sport Field to pick up the events, and two special television cables connected the field with the television transmitter at the Berlin radio tower. The pistol shot at the beginning of all races also opened the lens of the motion picture camera connected with the iconoscope, and while the event was being televised, it was also being "shot" for later projection.

Many of the public television stations are located in official buildings. At almost any time of the day one may wander in, take a seat, and watch the events as they take place in all sections of the city. Just as the days of the penny arcade were a forerunner of the vast cinema industry, so this



One of the iconoscope cameras used for televising the Olympic Games in Berlin.

public television service may well be an indication of what one can expect of this medium of entertainment in a few years to come.

The projector receiving sets at first glance look like an ordinary console radio. The pictures are 8 by 10 inches in size, with 180 lines and 25 frames per second. They attain a remarkable picture quality of a greenish hue, and the accompanying sound is for the most part quite clear and understandable.

The sending studio, located in a post office not far from Berlin's "Rundfunkhaus," is quite small and unpretentious. Hung with rough sacking, the only object in the 10 ft. by 12 ft. studio is a high stool on which the artists perch directly in front of the huge iconoscope.

By turns, a Greek tenor who sings Italian arias with quite a degree of finesse, but whose wit would have made of him a much better comedian; a swarthy mandolin-playing and singing Cuban; a lovely blonde frau-lein announcer, who incidentally aspires to the London stage; appear before their small but enthusiastic audience. They all display some nervousness in their work, and their decided efforts to keep a broad grin always in evidence gives the audience a feeling that these people are amateurs.

## The Use of Special Make-up

On the whole there is not much fuss made about special make-up for an appearance on television. Some of the performers use a panchromatic make-up, applying a sunburn shade of powder and lipstick of a brownish hue. Some women, however, use their own street make-up with quite a degree of success in the transmission.

Interspersed throughout the evening schedule of live talent are cinema reels. Running more or less to current events and travelogues, they show a wide variety of subjects, many of which had previously been televised.

But to return to the television-telephone service. What seemed to most people a scientific marvel not to be realised by this generation, has actually come into being with the inauguration of a regular service between Berlin and Leipzig. Heralded for so many years as one of the things to come, the public finds it almost unbelievable that the day is near at hand when it will be an ordinary occurrence to see the person to whom he is telephoning.

There are two offices in Berlin where one may place these calls—at the Potsdamer Platz, not far from the famous Unter den Linden thoroughfare of embassies; and at the Zoo station near the gay Kurfurstendam, street of night clubs and sidewalk café.

Suppose someone living in Berlin had a sudden desire to see a relative or friend who lives in Leipzig, fifty miles away. All he need do is go to either one of these two offices, give the name and address of his friend, and the time he would like to make the call.

The person in Leipzig is immediately informed, and at the appointed time they sit down before a small screen and the pictures of each are transmitted over a special cable from Berlin to Leipzig and vice-versa. They might well be sitting across the dinner table conversing, so clear is the transmission.

## Pictures Three Feet Square

Still another big step has been taken by Germany with the Telefunken Gesellschaft's introduction of a method for projecting pictures on a screen 3 ft. square.

These larger pictures are produced by a cathode-ray tube receiver, but in the new instrument the cathode-ray bulb is very small and the end instead of being curved is flat in order to eliminate distortion in the image, and thick so that it may withstand outside air pressure.

The picture thrown on the end of this tube is about 2 by 2½ inches, and the end of the tube is fitted to a large projection lens, which enlarges and throws it upon a separate screen. To obtain a bright and sharp enough picture on the end of the tube, the power has been stepped up to 20,000 volts.

R. C.

## PALMISTRY AT THE "BIG HOUSE"

Of a quiet and retiring disposition, Bert Handle of the B.B.C. Variety Orchestra, pursued the even tenor of his life playing the guitar for the Orchestra. Like a bolt from the blue it was discovered suddenly that Bert Handle had studied, over a long period of years, the art of palmistry. With him it has been an absorbing hobby and is now part of his make-up. The result is that members of the Variety Orchestra now know the whys and wherefores of their variegated lives. Bert Handle is so clever with his diagnoses that many broadcast officials refuse to let him see the inside of their hands.

# RADIO IN THE FAR NORTH

*The Oxford University Arctic Expedition returned from North-East Land at the beginning of last Autumn after carrying out wireless research on the Heaviside Layer, or Ionosphere. Below A. B. Whatman, of the Royal Corps of Signals, gives a fascinating account of the activities of the Expedition.*

**T**HE Oxford University Arctic Expedition, 1935-6, returned in September from a fourteen months' visit to North-East Land, approximately 80° North and 20° East, where it succeeded in carrying out a comprehensive programme of scientific research.

## An Island Covered With Ice

North-East Land is an island which consists almost entirely of a sheet of ice, which rises at its highest point to 3,000 feet, and only on the north, south and west coasts does a narrow coastal belt of low, rocky mountains raise their heads above it. The east coast consists of a cliff of ice, 150 ft. high, stretching for over 100 miles.

Probably no previous expedition has ever taken such a large amount of wireless equipment, for, besides having three wireless telegraph stations, it also carried out research on the Heaviside Layer, or the Ionosphere as it is now generally called. The total weight of all the apparatus, when packed, was several tons, and 1,600 gallons of petrol were taken for running the engines for the research and for the communications.

The base station was the largest of the

three, and was fitted with a 1-kw. transmitter whose power was obtained from dynamos driven by an Austin Seven engine. This set was used for monthly communication with Portishead Radio, which handled the Press traffic of the expedition, and for monthly communication with Mr. Douglas Johnson, G 6 D W of Kingston Hill, who had obtained special leave from the General Post Office to send and receive private and technical messages to and from North-East Land. The set was lent by the War Department.

At the base was also a 15-watt transmitter, made by Gambrell Bros., which was used for sending weekly to Advent Bay, Spitsbergen, and for thrice-daily weather reports which were sent to Bear Island Radio, situated half-way between Norway and North-East Land. These weather reports were eventually relayed to the Air Ministry, so that if my readers noticed any improvement in the weather forecasting between September, 1935 and April, 1936, they now know the reason why. Perhaps, however, they found the opposite.

## Cycle Generators

This low-power sender was also used for daily work with the two other expedition stations, which were situated in tents buried down deep into the ice of the interior, referred to above, and usually known as an

.....  
The operator at one of the ice-cap stations passes the time reading, while his supper is cooking on the primus stove. The tent was buried eight feet below the snow surface, but despite continuous blizzards and low temperature, the interior was always warm and comfortable.



Dogs drawing a sledge over the ice in the early spring. The dogs are driven in the fan system—that is, each dog is attached by a separate trace to the sledge.

“ice-cap.” The power supply was obtained from a pedal-driven generator, kindly loaned by Haslam & Newton, Ltd. One of the ice-cap stations was equipped with a similar installation, but a rather smaller generator was used, lent by Mortley, Sprague & Co., Ltd. The other station had only a receiver. All three stations used Eddystone All-World-Four receivers, and communication was always perfect.

It is worth remarking that the pedal-driven generator is an extremely reliable and handy piece of machinery, very suitable for portable transmitters, particularly where the use of a rotary transformer is ruled out because of the difficulty of accumulator charging.

## Taking Pictures of Echoes

The apparatus for the Ionosphere research required alternating current, and this was obtained from a 230-volt generator driven by a governed 2 b.h.p. Petter engine. It was a somewhat complicated apparatus, and was built under the guidance of the staff of the radio research station, who also planned the programme to be carried out, and lent part of the receiving gear.

The method of studying the layers is briefly this. The transmitter is arranged to send out a very short burst of waves, 50 times per second. Part of these waves travel directly across the ground to the receiver, which is placed about 70 yards away. Another part goes up to the layers and is reflected down and reaches the receiver a split second later than the part which has come direct. This time lag is accurately measured by means of a cathode-ray oscillograph, and a photographic record is made. The fact that 50 bursts of waves are sent out each second enables the pattern seen on the screen of the oscillograph to appear stationary. The layers behave differently to waves of different frequencies, and a complete observation consists of making a photograph of the echo pattern from the lowest frequency at which echoes appear, to the highest, working

(Please turn to page 585.)

## WHILE HIS SUPPER COOKS



# BEAM VALVES BY CARDEN SHEILS

IN the ordinary way the electrons set free from the filament of a valve may be said to be "broadcast" in the sense that they are emitted from it in all directions. Their subsequent path to the plate is, of course, controlled by the grid, but since this is wound spirally around the length of the filament, it does not exercise any definite directional effect.

The latest development in valve working is to focus the electrons into a directed jet or beam, which is then swung to and fro by the applied signal voltage, so that it hits or misses the plate, and so sets up amplified signal currents in the output circuit. The newcomer, which is known as the "beam" valve, in some ways resembles a cathode-ray tube more than the standard type of valve to which we have become accustomed.

Here are some of the arguments in favour of focusing the electron stream :

It has been known for a long time that certain advantages would be gained if the plate could be spaced well away from the grid. But in actual practice it was found that the separation led to more loss of power than was worth while. In other words, the amount of current which can be forced through the ordinary type of valve falls off very rapidly as the inter-electrode spacing is increased.

### The Effect of Electrode Crowding

And so designers crowded the filament, grid and plate as close together as possible. This, however, gave rise to undesirable capacity-coupling between the grid and plate, and so handicapped the valve as a high-frequency amplifier. As a remedy they introduced a screening-grid, which reduced back-coupling inside the bulb, but gave rise in turn to secondary emission. Finally, to overcome the so-called dynatron effect, they added a suppressor grid, and so arrived at the modern pentode, where no less than

*A new type of radio valve in which capacity effects are overcome by adopting similar methods to those used in cathode-ray tubes*

five electrodes are fitted inside the bulb, more or less on top of each other.

The idea of forming the electrons into a jet or beam represents a new attack on the problem of spacing the grid well away from the anode. It also increases the sensitivity of the valve, because a long jet of electrons is obviously more responsive to a given deflecting force than a short one.

### High Sensitivity

On the one hand, therefore, we get the advantage of high sensitivity, with no undesirable capacity-coupling between the input and output circuits, and no objectionable "dynatron" action between plate and grid. On the other hand, there is little loss of power because all the available electrons are concentrated into one narrow path. This

prevents the kind of leakage which occurs, for instance, between the edges of the ordinary spiral grid and the inner surface of the glass bulb.

Fig. 1 shows schematically the electrode arrangement used in one type of beam valve. The filament *F* is surrounded by a negatively charged tube *G*, which repels the electrons and so bunches them together into a beam, in much the same way as the Wehnelt cylinder does in a cathode-ray tube. Just above the tube is a flat plate *P*, which carries a high positive voltage, and has a central aperture through which the beam of electrons is accelerated towards the collecting anode *A*, which is cup-shaped and located at the far end of the bulb.

The tube *G*, in addition to focusing the electrons into a beam, also serves to control the number of electrons which reach the grid. That is to say, it contains the output current in accordance with the applied signals.

### The General Assembly

Fig. 2 indicates more clearly the way in which the jet-forming electrodes are assembled inside the bulb. In this case the cathode is indirectly heated, and the control tube *G* takes the form of a cylinder, with a narrow slit at the top, through which the electrons pass under the pull of the accelerating electrode *P*. Above the latter is a perforated guard-plate *P*<sup>1</sup>, which protects the lower electrodes from any secondary electrons produced by the impact of the primary stream against the collecting anode *A*.

The diameter of the guard-plate is made substantially the same as that of the glass-bulb, the side flanges *B* are added to complete the separation. It will be seen that the

anode *A* is set at a comparatively large distance away from the filament and grid, the spacing being fixed by two leads fused into a common glass bead *C*. The spacing reduces capacity coupling between input and output to an absolute minimum, even in the case of very short waves, whilst the guard-plate effectively prevents any dynatron effect.

The control action of the tube *G* depends upon the extent to which the electrons are diverted away from the central apertures. Even when the jet is not deflected to one side or other, there will be some marginal loss in passing through the apertures, and this in turn tends to reduce the maximum current which can be fed to the anode.

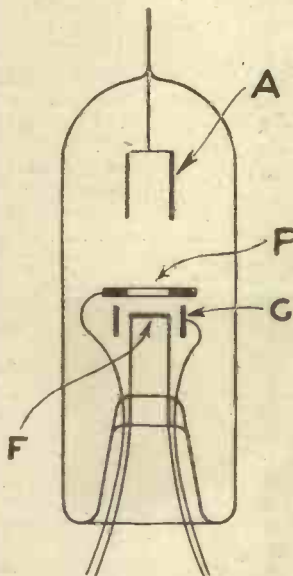


Fig. 1. Showing the disposition of the electrodes in one of the new valves.

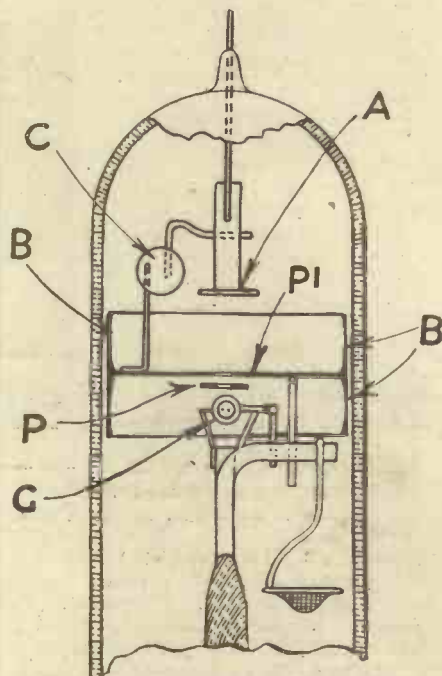


Fig. 2.—A pictorial sketch illustrating how the valve of Fig. 1 is arranged in practice.

Fig. 3 shows a type of beam valve in which this kind of loss does not occur, so that it is particularly suitable for power work.

In this so-called "critical-distance" beam valve the focusing effect is produced by the action of two spiral windings *G*, *G*<sup>1</sup>, which surround the filament *F* in much the same way as the ordinary control and screen grids. The two windings are, however "staggered" relatively to each other in such a way, and the biasing voltages and distances are so chosen, that the electrons are all clustered inside the shaded area.

This is proved by the fact that if a cylindrical anode *A* is used, the parts lying outside the shaded area can be cut away without affecting the total output current. As before, the anode *A* is spaced well away from the grid and cathode, so that there is no internal capacity-coupling when the valve is used for short-wave working.

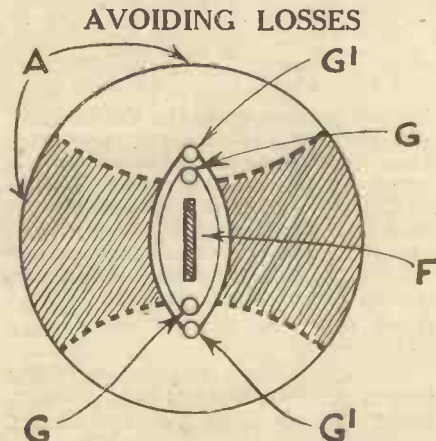


Fig. 3.—An electrode layout which avoids certain electron losses that occur in the Fig. 2 valve.

# LEARNING FRENCH THROUGH YOUR RADIO

**A** PART from the IRREGULAR VERBS there remains now only one class of verbs to be learnt. A specimen of this class—not a large class by the way—is RECEVOIR (to receive).

The TWO PARTICIPLES of RECEVOIR are RECEVANT, REÇU.

I want you to notice the cedilla accent (ç) under the c in the PAST PARTICIPLE REÇU. Let me explain this. The c in RECEVOIR is always soft. That is, it is always pronounced like an English s. But a French c can be both soft and hard. In fact, it is always hard when it comes before an a, o, or u. Take, for instance, the French word for a peanut—une cacahouette. This is pronounced kah-kah-wet, because both the c's are followed by an a. In certain TENSES of RECEVOIR the c is followed by a, u and an o. In these TENSES, then, the c should be hard. But I have told you that THE C IN RECEVOIR IS ALWAYS SOFT, AND IT IS MADE SOFT BEFORE AN O OR A U BY PUTTING THIS CEDILLA ACCENT UNDER IT.

Try to remember this in French:

CA is pronounced kah  
ÇA is pronounced sah

Now to conjugate the NINE TENSES of RECEVOIR.

**TENSE No. 1**

Je reçois	re(r)-səwah	I receive,
tu reçois	re(r)-səwah	etc.
il reçoit	re(r)-səwah	
n. recevons	re(r)-səw(ə)ng	
v. recevez	re(r)-səwah	
ils. reçoivent	re(r)-səwah	

(Note the cedilla accent, and be able to account for its presence or otherwise.)

**TENSE No. 2 (I was receiving, etc.)**

Recevais, recevais, recevait, recevions, receviez, recevaient.

(Note there is no cedilla in this Tense. Why?)

**TENSE No. 3 (I received, etc.)**

reçus, reçus, reçut, reçûmes, reçûtes, reçurent.

(Observe the cedilla throughout here.)

**TENSES 4, 5, 6, and 7 (Always easy!)**

J'ai reçu	I have received
J'avais reçu	I had received
J'aurai reçu	I will have received
J'aurais reçu	I would have received

**TENSES 8 and 9 need careful attention.**

JE RECEVRAI	I will receive, etc.
TU RECEVRAS	
IL RECEVRA	
N. RECEVRONS	
V. RECEVREZ	
ILS RECEVRAIENT	
JE RECEVRAIS	I would receive, etc.
TU RECEVRAIS	
IL RECEVRAIT	
N. RECEVRIIONS	
V. RECEVRIEZ	
ILS RECEVRAIENT	

(Note again that in these two tenses there is no need for the cedilla.)

Well, this is the verb TO RECEIVE. What about those other English verbs that end with the syllable -CEIVE? Words like con-CEIVE, de-CEIVE, per-CEIVE, etc. Remember this, will you. They appear in French in the same form as RECEVOIR. Look! con-CEVOIR, dé-CEVOIR, aper-CEVOIR. It's a point

*This is Part 46 of our special language series*

By S. C. Gillard, M.A.

worth remembering, don't you think so? Let me give you a few sentences on the word CONCEVOIR (to conceive). Just notice how exactly like RECEVOIR it is as regards conjugation.

J'ai conçu de l'amitié pour Monsieur X  
I have taken a liking to Mr. X.

Elle avait conçu des soupçons contre moi  
She had become suspicious of me.

**"FIRST TIME IN THE RING"**



German secondary schools have recently introduced boxing lessons into their regular curricula and these are being backed up by special broadcasts. Here we see Frank Krüger explaining the principles of boxing to young listeners in the "First Time in the Ring" Series, which was broadcast in the Berlin programme.

Ils conçoivent des doutes sur le succès de l'entreprise  
They have doubts regarding the success of the enterprise.

Les espoirs que nous avons conçus.  
The hopes that we have entertained.

Je ne conçois rien à cela.  
I don't understand it at all.

Cela se conçoit facilement.  
That is easily understood

Conçoit-on!  
Fancy!

I would like you to notice, too, in the sentences above, the cedilla accents. Not only those in CONCEVOIR but in the other words as well.

DEVOIR (to have to) is another important verb of this conjugation. It is so important, however, that it demands almost a whole page to itself. I will deal with it next week.

Here is a test on the verbs I have given you above. Write out the following sentences, putting the verb in TENSES 1, 4 and 8 respectively.

- (1) Je *recevoir* des amis chez moi.
- (2) Vous ne nous *décevoir* pas.
- (3) Il *apercevoir* mon erreur.
- (4) *Concevoir*-tu des espoirs?
- (5) Les *recevoir*-nous?
- (6) Cela nous *décevoir*.
- (7) Ils *recevoir* tout mon argent.
- (8) Ne *concevoir*-vous d'autres plans?
- (9) Vous *l'apercevoir*.
- (10) Le *recevoir*-il?

Fair copy next week.

I want to talk about IMPERSONAL VERBS now. These verbs are found in

ONE PERSON only—the 3rd Person Singular. IL, instead of being translated HE, is translated IT. The English impersonal sentences "it is cold," "it is raining," "it is important that . . ." show what I mean.

Of course, these IMPERSONAL VERBS have their NINE TENSES like other verbs, but, let me repeat, ONLY ONE PERSON.

There are a number of IMPERSONAL VERBS which are used in connection with the WEATHER. Hence their importance, for in France, as in England, the weather is a popular topic of conversation.

We will classify these WEATHER terms as far as possible. A number of them involve verbs of the 1st Conjugation. (See Part 18.)

il éclaire (eh-klair)	it is lightening
il dégèle (deh-shehl)	it thaws
il gèle (shehl)	it is freezing
il grêle (grehl)	it is hailing
il neige (nehsh)	it is snowing
il tonne (tonn)	it thunders
il tombe de la pluie	it is raining

It is to be noticed, however, that although theoretically all these verbs have the usual NINE TENSES, in practice only two tenses are commonly found—the PRESENT and the IMPERFECT. Look at their IMPERFECTS:

il éclairait	it was lightening
il dégelait	it was thawing
il gelait	it was freezing
il grêlait	it was hailing
il neigeait	it was snowing
il tonnait	it was thundering
il tombait de la pluie	it was raining

Other 1st Conjugation verbs which are not WEATHER verbs are:

il arrive	it happens
il importe	it is important
il y va de	it is a question of

Verbs of other Conjugations are also used IMPERSONALLY. Such as:

il s'agit de	it is a question of
il faut	it is necessary
il pleut	it is raining
il paraît	it appears

Another group of IMPERSONAL VERBS are those which employ the 3rd Person Singular of FAIRE (to make, to do.) Again, these refer to the WEATHER.

il fait beau	it is fine
il fait du brouillard	it is foggy
il fait chaud	it is warm
il fait doux	it is mild
il fait jour	it is daylight
il fait nuit	it is dark
il fait du soleil	it is sunny
il fait de la neige	it is snowing

(These expressions in the IMPERFECT are: il faisait beau, chaud, nuit, etc.) These eight sentences might be used in answer to the question QUEL TEMPS FAIT-IL? (What is the weather like?) With FAIRE, several, if not all the NINE TENSES might be used, so I ought to give you the 3rd Person Singular of this verb throughout.

IL fait, faisait, fit—a fait, avait fait, aura fait, aurait fait—fera, ferait.

You will see from this that the TWO PARTICIPLES of FAIRE are FAISANT, FAIT. We use verbs IMPERSONALLY

(Please turn to page 583.)





# FROM OUR READERS—Continued

played; as, I said, it is really a direct link with the transmitter.

Having thus far impressed my friend, I said I would prove it by disconnecting the earth wire.

This I did, and to my dismay once more tuned-in Zeesen (the same one) with hardly any appreciable loss in signal strength! I now had no leg to stand on, and vowed I would keep my knowledge of wireless to myself in future.

Yours truly,

C. S. HEATH.

Dunstan, Tadworth, Surrey.

## OH YEAH!

The Editor, POPULAR WIRELESS.

Dear Sir,—You have asked for a funny story: how is this one? Close to my home is an aerodrome, on the borders of which are built council houses. A workmate of mine visited a friend of his in these houses, and returned with this yarn: "Where I went the other night, my friend had a mains set, but it picked up considerable interference from the workshop on the aerodrome. Through the speaker came the noise of an engine being started, wood being sawn, metal being sawn and filed, hammering, and a spanner being dropped—in fact, the interference was so bad that you could even hear coke being shovelled up and thrown into the stove-pot."

Yours sincerely,

WILLIAM CLEWS.

35, Alberta Street, Longton, Staffs.

## INVERTED VOLTS

The Editor, "Popular Wireless."

Dear Sir,—I see that W. L. S. was discussing the Screen-Grid Valve as detector recently in several circuits which are avowedly freak.

I enclose circuit which I have been using for some time in our ordinary house receiver. It has shown no shortcomings, while, owing I believe to the fact that the valve is being worked in the negative kink, the selectivity has to be tried to be believed.

I can make it work only with a Mullard P.M. 12A, although the manufacturers, when I wrote asking them whether my sole copy of this valve was a freak, assured me that it was possible to do the same with their other S.G.s. I have tried with three P.M.12s, but without success.

The components given are optimum values arrived at after a lot of experimenting, except the 3,000-ohm resistance on the screen. This happened to be the nearest to the usual 1,000 that I had by me.

Faithfully yours,  
WILLIAM B. WEST.  
"Trouville," Middle Deal Road, Deal, Kent.

## "I'LL SECOND THAT!"

The Editor, POPULAR WIRELESS.

Dear Sir,—May I support Mr. J. Rundle's plea for an A.C. mains 2 H.F. straight set with push-pull output, as outlined by him in the Jan. 16th issue of POPULAR WIRELESS? I would add, with A.V.C. designed to minimise the effects of fading rather than aiming at constant volume on all stations, and not too big an output, but it must be push-pull.

Yours faithfully,

PERCY J. FOSTER.

"Runnymede," Beally Avenue, Cardiff.

## FROM CRYSTAL TO S.T.800

The Editor, "Popular Wireless."

Dear Sir,—I like one thing in particular in "P.W.," and that's readers' letters on their radio experiences. Of course, my own are no exception, and I can remember many comical incidents since I started on wireless about three years ago. When I began I didn't know a thing about it, and it was only suggested to me

by a pal who played about in a shed with a crystal set, using an aerial of about fifty one-ft. lengths of different wire and a home-made earphone. Of course, he couldn't make it work, so I bought it for 1s. 6d.—complete with earphone.

However, I got it home and routed out an old wireless book, dated about 1926, and it was full of crystal sets, so I wound another coil, as it said, and wired it up to a copy, with ordinary cotton-covered wire and twisted joints everywhere. Then I got a real pair of earphones!—and a friend came across to see it.

He sat down with the 'phones on his head and scratched about with the cats-whisker for about an hour trying (as he kept saying) to get a "pop." The upshot was we discovered with a rush that we had no aerial or earth. So the friend promptly cleared off and left me to put up an aerial. I bought two insulators and wire, etc., and tied one end to the clothes post and the other end to the gutter, and on that same Sunday night the set struck up—and worked!

To have seen that set, with its coil round a cocoa tin, its crystal mounted on a match-box, and a variable condenser that wouldn't turn, I often wonder how it ever did work! But it did, and since that day I've never left wireless alone for a minute. After using his set for about a month a neighbour bought a new commercial set and gave me his old one—a three-valver—det. and 2 L.F., with two old transformers and very old valves.

Again, the friend appeared and sorted out the battery leads and lent me an old H.T. and accumulator. An old horn speaker was also caged. And then the great switch-on, and the excitement when the speaker squeaked forth! The next day I discovered that the set wouldn't work, and my pal told me that it was nothing unusual—it was only the accumulator conked out—and of course that wasn't the first time I was to experience that sudden fade-out!

After this all went lovely. I put the set in a cabinet, bought a good speaker, replaced the valves and transformers and eventually nearly had a new set that worked well for a good time. And so I went on making sets, until I built a complete radiogram to my own design, complete with set, gramo, dial and turntable lights, automatic stop, and complete fittings—and we've still got it. Then came short- and all-wave designs, and after dozens of successful

short-wavers from W. L. S., I've finished off with the S.T.800—the best set I can honestly say I've ever made. Now I think I must close by wishing you and "P.W." every success in wireless design.

Yours faithfully,

S. A. KNIGHT.

5, Bailey Road, Westcott, Nr. Dorking, Surrey.

## STILL GOING STRONG

The Editor, POPULAR WIRELESS.

Dear Sir,—Every week I read with interest the letters in "P.W." I am not well versed in the technical side of wireless, but just know sufficient to maintain my own little 2-valve set, about which the history might interest you.

As you probably know, Aldershot is a big military station. Well, about six years ago, my brother-in-law was in the sergeants' mess one night when it was announced that some adventurous person, having bought an up-to-date wireless set, was going to raffle his old set for 1s. per ticket.

Tickets went round, and to cut a long story short, my brother-in-law won it. He brought it round to my house. We got an aerial and batteries fixed up and two nights later sat marvelling at the squeaky music that came straining through the earphones. It was incredible, we all said, as the family listened one by one.

Then yet another wonder was added. A horn speaker was heard of for sale, and this, after a ridiculously high price being given for it, eventually found its way to the L.S. terminals

on our funny little box on the table, with two enormous and ugly-looking dials on the front and a bunch of spare coils lying beside it.

Then came the disaster. One night, having put the cat out 'because it was stamping its feet on the carpet, the entire family sat round the funny little box. Coils were put in, dials were set, and then the switch was pulled out. What did we hear? Nothing. Our wonderful apparatus had gone wrong. Or was it the station? But after

15 minutes had passed with still no results, we decided it was the set.

My brother-in-law was sent for, and he, who knew quite a bit about wireless, made several tests, then said that one of the valves had gone.

After much discussion we decided to strip and rebuild the set, as by this time we had had about eight months' wear out of it.

New valves, transformer, and condensers were added, together with a dual-range coil, and so once more the little box returned to its place on the table, this time giving more volume and better reception.

The next addition was a mains battery eliminator. This improved still more the tone and reception of the set.

And so time passed, our little set continuing to give us enjoyment until not so very long ago, when yet another disaster occurred.

One afternoon, when everyone was out, my father went in to find the living room was being gutted by a fire, the source of which was never known. The fire was, however, not so serious as it had at first seemed, and three or four firemen soon had it under control. But, alas, the cabinet of my set was scorched, the exterior wires were burnt, and I thought it was the end of the little set which gave me so much enjoyment, but after an examination, and to my relief, the inside was undamaged! And so, after replacing the cabinet and the exterior wires, music once more came up through the speaker.

And so the set went on. Then, having by this time got more acquainted with the wonders of wireless, I thought I would try my luck at converting it into a radiogram.

I got a friend who is a carpenter to build a cabinet, and in the meantime bought a gramophone motor and turntable and a B.T.H. pick-up. I also added a pentode valve and moving-coil loudspeaker. The cabinet was finished, a very nice piece of furniture with oak panels and doors, standing 3 ft. 6 ins. high. The set, speaker, and gramophone were installed, complete with mains fuses and interior light.

No longer stands that table in the corner with its assortment of batteries, etc., on it. But in its place stands an up-to-date "Radiogram 2" mains set giving very good reception of English and foreign stations. And I wouldn't swap my set for any of your modern sets, and anyone is welcome to hear it.

I remain, yours truly,

C. J. CADWELL.

Yd. Foreman's Qtrs., W.D.-hands Yard, Stanhope Lines, Aldershot, Hants.

## A GUINEA

is paid each week for the letter which, in the Editor's opinion, is the best one sent in by a reader (Mr. E. Fisher gets it this week), and there is no reason why you should not win one.

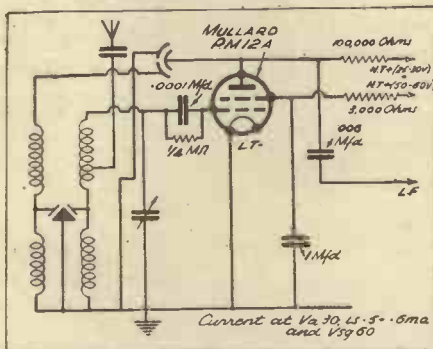
If you have had any interesting radio experiences—and who hasn't?—or if you have any opinions of general radio interest to ventilate, send them along to "P.W."

This page is open to readers every week, and from each batch of correspondence we select those letters which we consider to be of the greatest general interest to other readers.

So don't hold back! Remember you may get a guinea

## FOR YOUR LETTER

## A SELECTIVE CIRCUIT



The chief feature of this circuit, sent by Mr. William B. West, is that the screen-grid volts are higher than the anode volts.

# BE CHEERFUL— WITH HARRY DAVIDSON!

*Well-known Director of the Commodore Grand Orchestra—  
famed for its Saturday lunch-hour broadcasts—who believes in  
“brightness in everything . . .”*

By Fleurette Calver

“WELL,” said Harry, having dismissed his tailor and various other people, “what can I do for you?”

“Tell me all about yourself, and your orchestra,” I replied, and gave him a lead by asking him if he was a naval man, as his signature tune rather implied.

“Oh, no!” he laughed. “*Sons of the Sea* was inspired partly by the fact that our orchestra, as you know, is called the Commodore Grand Orchestra, and partly from the name of the A.B.C. theatre firm. I believe in brightness in everything, and when making up my programmes I always choose the most cheerful music—hence the rollicking signature tune.”

“I suppose you have a great many request numbers?”

“Yes. Thousands, from all over the country. And we put hours of practice into the programmes. Choice of music is one of the greatest problems in broadcasting, as with so many listeners to please the greatest care must be taken. But we try to stick to our policy of helping to cheer people up.”

## Fine Pre-War Record

“I believe you were quite successful even before the War,” I ventured.

Harry smiled (and what a smile!).

“I was a cinema pianist, and consequently had to know how to play every conceivable piece of music for the purpose of fitting the various scenes depicted. This could be done only by committing everything to memory. Then the organ crept into various cinemas—notably with the Davis Circuit. I started at their first cinema, the Pavilion, Highgate, and went to every other theatre they built, including the Marble Arch Pavilion, which was considered one of London’s greatest cinemas. From there I was appointed Musical Director of the great Trade Show house, the Shaftesbury Pavilion, where I had one of the finest orchestras in the country.

“At the height of my success the Army claimed my services, and after the War Sir Oswald Stoll sent me to Newcastle to open the Tyne Theatre—afterwards named the Stoll Picture House, to conduct an orchestra of twenty-five musicians, the biggest orchestra at any cinema in the North. Wonderful stage setting and acts soon set the people talking, and consequently this House became the rendezvous of the North. I was in Newcastle four and a half years, then went to the Majestic, Leeds, as sub-conductor and solo organist. I was also in charge of the dance band in the restaurant, which went “on the air” every evening from five to six through the

Leeds station. I was there seven and a half years.

“And then—” I queried.

“I was appointed to the Commodore Theatre, Hammersmith, as solo organist, and started making gramophone records, which have been broadcast and sold all over the world. Soon after this, I was given the chance of directing the Commodore Grand Orchestra, which is famous for having broadcast for over six years every Saturday between 1 and 2 p.m. besides doing on an average two other broadcasts during the week. Of course, on ‘high-days and holidays’ the Commodore Grand Orchestra is almost a ‘cert’ on radio programmes.”

So now you know. If you feel blue, think of the *Sons of the Sea*, and if it happens to be a Saturday morning—well, tune in.

## RUNNING EXTENSION LEADS

A simple method of overcoming what at first sight seems a ticklish job

**L**OUDSPEAKER extension leads can be run along picture rails or around the skirting of a room quite neatly by the most inexperienced of amateur electricians, but a nasty little problem has to be faced when it is a question of carrying the leads out of one room into another. True, they can be run round the door jamb or under the door, as most doors fit so beautifully that plenty of space for this is available!

But it is at such a point that the wires almost invariably become visible and spoil an otherwise nice little job. The alternative of drilling a hole right through a wall is not to be faced lightly, but it is remarkable what can be done underneath flooring.

### Not a Difficult Task

One only has to watch a workman from the gas company or a professional electrician at work putting in new piping or wiring or inspecting systems already installed to gain an insight into the possibilities that lie beneath the boards. For the most part floor boards come up very easily. And in practically every room there are boards that come up with greater ease than others. These are the boards which the above professionals cunningly replace rather loosely in order to facilitate any of their further operations. And here



HARRY DAVIDSON

let us add is the secret of the creaking board which haunts most of our domiciles!

It may sound a big job to many people, but it is really quite easy. The carpet or linoleum can be rolled back and, with the assistance of a large chisel, a board can be prised up. In some cases it will be found that the dividing wall between rooms extends unbroken right across the rooms under the boards and even under doorways, but in none of the houses where we have explored these regions have we failed to find a convenient hole. But one must keep well away from all gaspipes and electric wires or the authorities concerned will be distinctly peeved.

It is surprising how much space exists underneath the floors. With numbers of sticks tied together we have managed to pass wires under a whole intervening room, but we must admit that we had to negotiate some very awkward beams!

## A BLACK ENAMEL FOR METALWORK

**T**HE many varieties of quick-drying black enamels which are sold in bottles or tins are not usually inexpensive commodities, and for some trifling local enamelling of a loudspeaker horn, a transformer case, or some similar component which has acquired a somewhat shabby appearance, the expense incurred in purchasing an entire tin or bottle of enamel is quite out of proportion with its usefulness.

Many constructional amateurs, however, have by them a quantity of ordinary clear varnish, and, in such instances, a black enamel suitable for the above-mentioned uses can very easily be made.

Dissolve two parts, by weight, of finely-powdered lamp black in twenty parts, by weight, of the clear varnish, and stir the mixture very thoroughly.

This composition will make an excellent black varnish. It is slow drying, but it possesses a good “body” and, next to a stove enamel, it is very resistant to rough handling. Moreover, the black varnish can be made up in very small quantities at a time, thus eliminating any possible waste.

## HAVE YOU TRIED A GLASS PANEL?

*You have probably seen glass panels on Exhibition receivers and admired the smart effect achieved. If you take a pride in your workmanship—and doesn't every constructor?—why not try one yourself? It's not a difficult job, as you will see.*

THE use of glass as a panel is generally avoided by constructors on account of the supposed difficulty in handling it. It must be admitted, in fact, that the listener who likes to experiment with his set, and who contemplates adding to or altering any of the panel components, would be well advised to stick to ebonite. But the constructor who intends his set to be both permanent and ornamental, and who is prepared to take a little more care than usual, will find that glass offers many advantages over the more orthodox panel. Glass, incidentally, is an excellent insulator.

### Like Framing a Picture

To obtain the best results, more than usual care must be taken in preparing the panel, and it may be necessary to modify to some degree the layout of your set.

Suppose, for example, you have a cabinet, with front inside measurements 12 in. by 10 in. You will require some picture beading of the type shown in the sketch. The dimensions of the glass will depend upon the width of this beading. With the beading shown, of course, the glass should be 10½ in. by 8½ in.

Briefly, in fact, we proceed merely as in framing a picture, the outside frame measurements to be 12 in. by 10 in., with the glass taking the place of the picture. The beading cut to length, the corners should be mitred with extreme care. Every care should be taken to ensure that the frame is a perfect fit into the cabinet. The frame made, we can turn our attention to drilling the glass.

### Method of Drilling

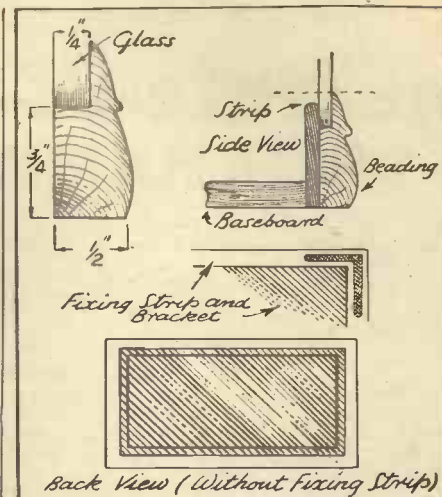
In order to lighten this part of the task, it is best to bring all terminals to an ebonite strip at the rear. This done, the average owner will find that he has only three, or perhaps four, holes to drill, each perhaps ⅜ in. in diameter. Place the glass on a perfectly flat surface, to obviate all risks of breaking or scratching it. A geared drill is preferable, as the drilling must be done slowly.

The question of drills is of paramount importance. Ordinary drills are useless. Specially prepared drills can sometimes be obtained, but personally I prefer three-cornered files, ground smooth and pointed. Drill slowly, bearing gently but firmly. For large holes it is best to drill an ¼-in. guide hole, as it proves quicker in the end. A compound of camphor and turpentine applied to the point of the drill will help matters considerably, while ordinary oil is better than nothing. The drills should be sharpened frequently with a small file. When half-way through, turn the glass and recommence on the opposite side.

### Final Fixing

The glass drilled, it can be placed in the frame and fastening strips screwed on. It is not essential to mitre these, but the top of the strip should not protrude above the level of the beading on the other side of the glass. Small brackets may be fixed on the corners, as shown. All fixing strips and brackets should, of course, be screwed from the inside.

The panel should now be ready for fixing to the baseboard. The constructor can judge for himself the number and size of the screws, but it is generally wise to add angle



How the beading and fixing strips are arranged.

brackets, whatever the size of the panel.

When fixing your components to the panel it is advisable to place a thin leather washer between the glass and the fixing nut. Do not screw up too tightly.

## WHEN THE BLUE LAMP GLOWS

*... It's Rehearsal Time at the B.B.C.*

JUST behind the main entrance hall at Broadcasting House, on one side of the artists' foyer, there stand three large notification boards, rather like the train indicators at London's main-line railway termini. Two of them show, at a glance, the traffic of the day, the hour-to-hour programmes on National, London Regional and Empire waveband, the studios in use, and so on; the type of indicator that even the stranger might visualise.

But few strangers would anticipate the third black board and its close-banked lines of data. It shows the rehearsals due for the day—rehearsals to begin at 9 or 9.15 a.m., and to go on, in quick, almost never-ending succession until, perhaps, two o'clock the following morning. Yet how many people think of rehearsals—drama rehearsals, talks rehearsals, music rehearsals, and many more—that precede the evening when, seated comfortably at home they, at the flick of a switch, hear only the finished production, with its first-night glitter and quick-flowing continuity.

Come, then, and see for yourself what happens at one of these "undress" shows. Way down in studio BA—twenty or thirty feet below street level—producer John Watt is compressing five hours' script into sixty minutes of broadcast time. In one grey-carpeted studio, with soft lights, a girl with fair hair is softly singing a love-song in the "ribbon" microphone which hangs between her and the window of the silence room. High on two of the walls are a line of lamps—one blue, one red, one yellow. The blue is the only one alight. Blue for rehearsals.

Mr. John Weaver, standing on a section of floor raised like a stage, is following his score, directing his orchestra and watching

the singing girl at the same time; now and then you see him glance towards the eye-like window of the silence room. You might imagine that he was asking without words: "Could that have been a flat one!" If it was, or if anything else needed "re-touching," the voice of producer John Watt would crash through a loudspeaker in the studio: "Stop, stop, stop!" Not an imperious command, though it achieves the result of one—but a kind of whimsical "Whoah!" And doors fly open as he sweeps from silence room to studio to explain a point of two. Always in good humour, with a good-natured jest now and then to keep everyone in an 8.30 p.m. frame of mind at 11 a.m. That may sound easy, but—Then, back to the silence room. The turn begins again and John Watt listens—with a stop-watch in his hand—rather like a timekeeper in what seems a hopeless race against time.

### Microphone Balance

Inside the actual studio a group of young men, some in evening dress, others in flannels, and girls in trim costumes, lounge in easy chairs, a critical eye on whoever happens to be singing, joking or laughing into the microphone. The band, which has a "mike" to itself, seems, to the untrained ear, to swamp the voice of the singer. Yet, in the silence room, whence the balanced blend of voice and band is fed by special circuits, the effect at rehearsals is virtually that which the listener hears.

There may be five, six or more rehearsals before a radio show—the final one only a few hours before the announcer introduces it to you; the climax of weeks of hard work. Each show, too, has its own problems, are finally overcome.

## LEARNING FRENCH THROUGH YOUR RADIO

(Continued from page 578.)

very frequently in English too. As, for instance:

There remains only one thing for me to do.

There happened a terrible accident in front of my house this morning.

Similarly in French:

Il ne me reste qu'une chose à faire.

Il arriva ce matin devant mon domicile un accident terrible.

Lastly, here are a number of words and phrases which I wrote down as I listened to a **FILM TALK—LES FILMS DU MOIS**—The Films of the Month.

Un film dramatique—a photo-play,—drama

" muet—a silent film

" parlé—a talkie

" sonore—a synchronised sound-film

" de reportage—a topical film, news film

" d'actualité—a topical film, news film

" à épisodes—a serial film

Le grand film français—the great French film

M.D. dans son rôle de H.—M.D. in the part of H.

Le grand metteur en scène français—the great French producer

Un vraiment très bon film—a really good film

Une série de films joyeux—a series of laughable films

Un excellent film d'aventures—an excellent adventure film

Un film d'espionnage—a spy-picture

Un des chefs-d'œuvre de Marlène Dietrich—one of Marlène Dietrich's masterpieces

Un excellent drame d'aventures—an excellent drama of adventure

Qui jusqu'au bout tient le spectateur en suspens—which holds the audience in suspense right to the end

Cet excellent acteur Peter Lorre—that excellent actor Peter Lorre

Il tient le rôle du vampire dans le film "Le Maudit"—he plays the part of the blood-sucker in the film "Le Maudit"

"Le Maudit"

# DON'T MISS NEXT WEEK'S "POPULAR WIRELESS"

It will contain full details of

## JOHN SCOTT-TAGGART'S CORONATION SET THE SUPER CENTURION

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### A 1'- FULL SIZE BLUEPRINT FREE

NEXT WEDNESDAY

Price 3d. as usual

On vient de mettre à l'écran la célèbre pièce burlesque de Molière—they have just filmed the famous burlesque play of M.

Le dialogue—the dialogue

La comédie—the comedy

Les interprètes—the performers, cast

Sur la scène—on the stage

Sur l'écran—on the screen

La mise en scène—the staging, production

Le théâtre classique est inutilisable pour le cinéma—the Classic Theatre can't be used for the screen

Le faux et l'artificiel sautent aux yeux—the false and the artificial catch the eye

Deux films excellents—two excellent films

Le scénario très amusant—the very amusing scenario

Ne manquez pas ces deux films—don't miss these two films

Un film de Jeunes pour les Grands—a film about young people for adults

Permanent de midi à minuit—continuous performance from midday to midnight

Le dernier triomphe de G.A.—the latest triumph of G.A.

Le film du moment—the film of the moment

Un film qui coupe la respiration—a film that takes your breath away

Cette belle artiste Jessie M.—that beautiful artiste Jessie M.

Le plus grand succès de l'écran—the greatest screen-success

Le film le plus drôle qui soit—the funniest film imaginable

Un film qui plaira à tous—a film that will please everybody

Films parlant anglais—English talkies

Sous-titres français—French sub-titles

Ce film passe au Cinéma des Champs-Élysées—this film is being shown at the Cinema of the Champs-Élysées

Mickey, dessins animés en couleurs—Mickey, motion-picture cartoons in colour

Elle a pour interprètes principaux—its principal artistes are

La mise en scène fastueuse—sumptuous production

La musique entraînante—lively music

Les jolies girls—pretty girls

Les scènes délicieuses—delightful scenery.

Dont l'interprétation réunit les noms de . . . —the cast of which contains the names of . . .

Un film policier qui ne ressemble à aucun autre—a police-film which resembles no other

"Trafic d'Armes" qui continue sa carrière au Cinéma Balzac—"Traffic in Arms" which continues its run at the Balzac (Cinema)

Une vedette de l'écran—a film-star

Why do many smokers prefer a MIXTURE?



Your smoker of Mixture is firmly convinced that no other form brings out so well the quality in a tobacco. If he smokes Airmen he is quite likely to be right.

## PLAYER'S AIRMAN MIXTURE

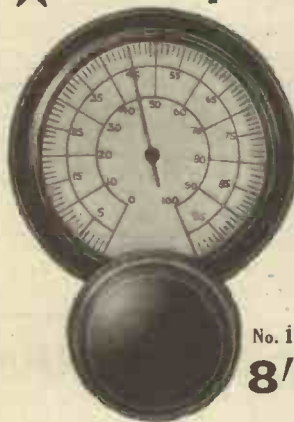
ALSO OBTAINABLE IN FLAKE OR NAVY CUT

10<sup>d</sup> PER OZ

NAVY CUT DE LUXE 10<sup>d</sup>

P.A. 51C

## ★ Incorporates the Best in DIAL DESIGN for MODERN Short Wave TUNING!



No. 1070

8/9

The movement can be mounted from panel or baseboard.

The dial is noiseless in operation even on the highest frequencies.

The open vision scale is clearly readable and divided in a new attractive manner into 100 divisions so that the indicating pointer has ample space for accurate settings.

The readings are arranged to increase as the frequency increases, which is in keeping with modern practice.

The movement is superbly smooth in action, without backlash on both the 20-1 and the 100-1 speeds.

The dial face fits on the front of the panel so that no large panel gap has to be cut unless it is desired to illuminate the scale from the back.

The dial can be used on panels up to 1/4" thick and takes the standard 3/8" spindle.

The escutcheon has a simple dignified appearance and is beautifully finished in oxidised silver relief.

## EDDYSTONE FULL VISION DUAL SPEED DIAL

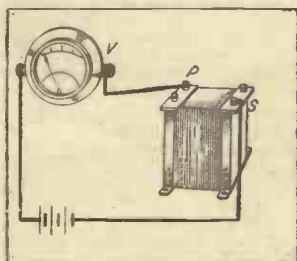
Sole Manufacturers: STRATTON & CO., LTD., Eddystone Works, Birmingham

London Service Depot: Webb's Radio, 14, Soho Street, Oxford Street, W.1.

# INCREASED H.T. CONSUMPTION ACCOMPANIED BY CRACKLING

S. C. (Croydon).—*I have had my set running satisfactorily for some years, but lately the anode current consumption of the detector valve has gone up to more than double and the signals have dropped. Also, there is an intermittent crackling noise, which I think is due to the transformer. As a matter of fact, I am pretty certain about this as I have changed the transformer and I get no crackles, and the anode current goes back to normal. What is likely to have happened to the transformer? How can I test it?*

It would seem that there is a leakage between primary and secondary or between primary and the core, or earth. The drop in signals may be due to the actual fault in that the secondary or primary windings may be faulty and be giving a reduced ratio or even poor connections, or the drop may be due to the fact that there is an H.T. leak and so the voltage on the valve is less than it should be. You



★ ★  
Fig. 1.—How the test between primary and secondary is carried out. (See reply to S. C., Croydon.)  
★ ★

have not apparently tested the voltage on the valve, though you have tested the current.

The first thing is to test the transformer windings for continuity. This is done with a small cell, say a part of a grid bias battery, and a voltmeter. Then test between the two windings to see if there is leakage between the two. You should not be able to get any voltage reading in the circuit shown in Fig. 1.

Then with the transformer connected as shown in Fig. 2 try another test. If you get a reading in the meter you may be pretty sure that there is a serious leak between the primary and the core. Raise the voltage to quite a high value before you pass this test as conclusive. Use an H.T. battery and an H.T. voltmeter. If no reading is shown try a lower voltage meter or even a milliammeter, for with no reading on the H.T. voltmeter it should be safe enough to try the milliammeter in circuit.

While you are at it you might as well try the same test but connect the battery to the secondary winding instead of the primary, and also try it connected to each end of the windings (primary and secondary) in turn.

I think you will find that there is a definite fault in your transformer and that in all probability the second test will show a reading in the meter. If it does there is nothing you can do about the transformer except send it back to the makers and get it repaired or changed.

## THANK YOU

F. W. Reading (Water Orton) writes to ask me to thank all those readers of "P.W." who were good enough to send him answers to his SOS for S.T.700 blue prints. He had over 400 letters and cards. Those who sent blue prints which will not be required will be getting them back in rotation. And on behalf of "P.W.," too, please accept our thanks.

But with the thanks letter comes another in less pleasant vein. Here it is. A reader asked for details of the "Cosmic" Three. The writer of the letter sent a card to the address given. He received a letter asking for the blue print and also any spare parts that he might have. Note that, please, "P.W." is not a spare parts agency.

No suggestion of paying for the parts was made, and though the blue print and cuttings of "P.W." concerning the set were sent, no reply in the way of acknowledgment or thanks has been received. The writer of the complaint ends up with this: "I am afraid it has made me a bit unconcerned now about SOS's, for I have not offered again, although I have

seen in 'P.W.' several times where I could have obliged."

Now then, you readers. Please have the decency to answer these senders of blue prints, especially after you have had the goods "delivered." I am afraid that the next letter of this sort that I receive will cause me to close these columns to SOS messages.

## THE PENTODE SCREECH

L. H. D. (Newmarket).—*Why does the pentode over-emphasise the high notes?*

The main trouble is that the pentode is a high impedance valve when compared with the ordinary output triode. It therefore has to have a high impedance output coupling arrangement so that the valve shall be properly matched. That means unfortunately that all too often the high notes in the pentode are better amplified than are the low notes. Obviously the high impedance output will offer a greater impedance to the higher audio frequencies than it will to the lower frequencies, and so we get the high notes very well reproduced while the low notes are not so well reproduced.

That is why—apart from the fact that the pentode is prone to develop third harmonics—we have to use a tone-corrector if we are using a speaker that is good on the high notes and also are using a pentode.

The tone-corrector merely by-passes the high notes, the by-pass effect increasing as the frequency of the notes increases.

A condenser placed across the output of the pentode will have the effect we require—of offering less impedance to the high notes as the frequency goes up—but it has in itself the undesirable effect of tending to tune the output circuit and to produce an impedance peak which might be very unpleasant.

So we place in series with the condenser a resistance which damps out the tuning effect and allows us to obtain the gradual decrease of impedance with increase of frequency which nullifies the increase of impedance with frequency which is provided by the high impedance output choke.

A plain resistance could be used instead of the condenser to reduce the high notes, but this would have the undesirable property of by-passing the low notes as well, and this is certainly not what we require.

You may ask why we cannot use an output coupling device of lower impedance and so avoid the high note exaggeration. This is impossible, because it would offer a load to the valve which would not enable us to get the maximum power out of it, the power being determined by the ratio between the impedance of the valve and the impedance of the load placed across it, or, in other words, the load in its anode circuit. Reduce this load, and all sorts of nasty things occur, the aural effect being not only loss of power but distortion.

## WHY NOT?

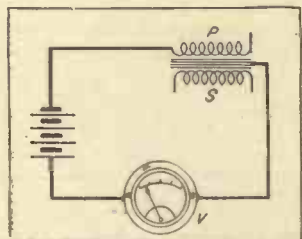
B. N. C. (Plumstead).—*Why is the autodyne arrangement of the short-wave superhel oscillator supposed to be inferior to the separate valve scheme?*

For the simple reason that in order to get the heterodyne effect it is necessary for the autodyne valve to oscillate at a frequency which is somewhat away from that of the received signal, and that frequency can only be obtained by detuning the valve away from the frequency of the received signal.

That means that the valve cannot possibly be as good a detector as it should be.

## MORE COPIES, PLEASE

A. H. Simmons, Holmwood, 8, Salisbury Avenue, St. Albans, Herts, wants a copy of "The Wireless Constructor" for March, 1934. Any offers? J. Parker, 348, Evesham Road, Astwood Bank, Redditch, Worcester, is after a diagram of the "Simplex" Two. This appeared in "P.W.," July 6th, 1935, which is now out of print. Can any reader help?



★ ★  
Fig. 2.—Checking a transformer for leakage between primary and core.  
★ ★

## PORTABLE ELECTRIC GRAMOPHONE

N. B. (Reading).—*Can I build a portable electric gramophone for a small puppet theatre? Have you any back numbers of "P.W." showing how to build one?*

I am afraid I have no such back numbers, though we did a small power portable gramophone some time ago. For a large room—such as indicated—you will want about 5 watts output. This can easily be obtained from a push-pull circuit, using universal valves.

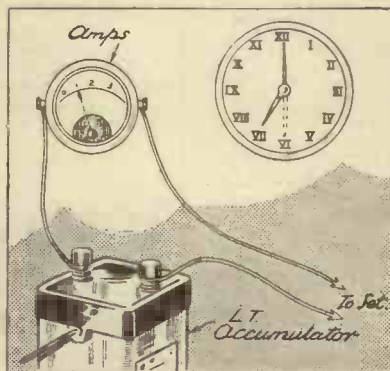
I should use a perfectly straight circuit with a screen pentode for input and a couple of large pentodes for the output.

I take it that you are going to use a speaker that is not incorporated in the actual amplifier and turntable unit. As regards the speaker, that should be placed so that the field winding is used as one of the main smoothing chokes, being the one that is situated farthest away from the rectifier. In other words, you have the rectifier, then a smoothing choke and condenser, and then the field winding of the speaker with another condenser.

The valves I suggest are the Cosmor, 13V.P.A., two 40P.P.A. output valves and a 40 S.U.A. rectifier. This combination will give you about 5 watts output.

# TECHNICALITIES EXPLAINED—No. 38

## Ampere Hour



This is a term which often upsets beginners in radio and electricity. It is a combination of the amount or rate of flow of an electric current with the unit of time. Thus we have a current of one ampere flowing in a circuit. If that ampere flows for one hour we say that the unit of one ampere hour has been used.

This type of unit is employed in calculating the capacity of an accumulator. Thus we say that a battery has a capacity of 20 ampere hours. What we mean is that it contains enough electricity to provide one ampere for twenty hours, or two amperes for ten hours, and so on.

The ampere hour is a measurement obtained by the simple multiplication of amperes and time.

## 1936 BROADCASTING REVIEWED

### The work of the Midland Region

ON the technical side the principal developments during the year were the introduction of ribbon microphones throughout the Birmingham station, and improvements in the gramophone and gramophone effects departments.

A Midland Music Advisory Committee was formed with Dr. Percy Hull, of Hereford Cathedral, as its chairman.

Bela Bartok played his own works with the B.B.C. Midland Orchestra. Guest conductors of this orchestra have included Rutland Boughton. Purcell's "Dido and Aeneas" was given in the studio, and also two short operas—Mozart's "Bastien and Bastienne" and W. H. Bell's "Hatsuyuki."

An interesting new series—"Question Time"—was begun in the autumn. Listeners' queries about orchestral matters were answered by Leslie Heward, who used the B.B.C. Midland Orchestra to illustrate his replies.

For the first time the Shakespeare Memorial Theatre Company visited a Birmingham studio.

Plays with a Midland interest included "The Furnace," by Francis Brett Young and William Armstrong; "Mr. Man," a story of a doctor's life, by a Birmingham medical student; and Masefield's "The Tragedy of Nan," given by a company drawn from the Cotswolds. "The Nailers," a Black Country dialect play by H. W. Small, a Wolverhampton journalist, dealing with events in Black Country industrial history and acted by players from that area, was revived for Midland listeners and also broadcast in the National programme.

### Outside Variety Broadcasts

For the first time a Midland studio performance of a West End success—"The Boy"—was broadcast, with two West End stars in the principal parts. Three burlesques with music—two by the Melluish Brothers and one by Moore Raymond—were notable; and there was a musical comedy about football by two Birmingham journalists.

Theatres from which Variety was taken included Coventry Hippodrome, Aston Hippodrome, Leicester Opera House, Nottingham Empire, Cheltenham Opera House, Worcester Theatre Royal, Bedford Royal County Theatre, Peterborough Empire, Northampton New Theatre, Oxford New Theatre, Derby Grand Theatre, Hanley Theatre Royal.

As the Working Men's Club movement is very strong, examples of variety entertainment were heard from clubs in Birmingham, Leicester and Derby.

Greatly increased use was made of the B.B.C. mobile recording unit. It was used, for instance, for "Music of the Hours," a series of mechanical chime-tunes in the Midlands; for a mass-production programme from a motor-car works; for Leighton point-to-point meeting; and for a Children's Hour programme from Castle Bromwich aerodrome on "How an aeroplane flies."

The Shropshire town of Market Drayton was the subject of a special programme in the "Microphone at Large" series. There were feature programmes about Malvern on the eve of the Drama Festival there; and about Hereford on the eve of the Three Choirs Festival. Mass production of motor cars was represented in a programme recorded at a Midland motor works. Midland and North collaborated in a programme called "Legends of the Peak" given from Bakewell; and to the National programme Midland contributed a programme about three Nottinghamshire villages entitled "Manor to Mine."

An interesting development was the use of outside broadcasts for the Children's Hour. There were three of these—one from Birmingham General Post Office, one from Birmingham Mint, and one from the Warwickshire County Cricket Ground. In August Miss Ruth Field was succeeded by Miss Enid Maxwell as Children's Hour Organiser.

"Midland Parliament" continued to meet monthly, except in the summer, to discuss industrial topics. Notable guest speakers included Miss Margaret Bondfield, Miss Ellen Wilkinson, and Mr. Austin Hopkinson, M.P. Frank Foster, Sydney Barnes, R. E. S. Wyatt, Larry Gains, Jack Hood, and Mercedes Gleitze were among the prominent sporting folk brought to the microphone for interview. A series giving the story of all the Midland football clubs in the first three divisions of the League was begun in the autumn. Speakers usually included the chairman of the club and a notable player.

(To be continued.)

## RADIO IN THE FAR NORTH

(Continued from page 576.)

upwards in steps of 0.1 mc./s. About 600 such records were made by the expedition in the course of the eleven months during which the apparatus was working. Many new and interesting data have been obtained.

Wireless has indeed broken the isolation of the lonely places of the earth. A telegram sent from the base, via Bear Island, with the first weather report at 7.30 a.m., was delivered the same afternoon in England; the voice of the B.B.C. announcer, or the strains of Henry Hall, can be heard as clearly in the Arctic as they can be by the fireside at home. None the less, it was a great thrill to the members of the expedition to hear the wishes of good cheer sent out to them on Christmas Day, and perhaps even more exciting to hear the announcer read out, on Boxing Day, the message of thanks that they had sent to the B.B.C. and all good friends at home: "Thank you for your messages, perfectly received and greatly appreciated. We wish all a Happy New Year."

### Help From Professional Operators

This narrative would not be complete without mention of the unfailing kindness and courtesy of the professional operators with whom the writer had to work. The operator at Bear Island, Lindberg by name, would always go out of his way to give the expedition every assistance. He spoke very good English, and since we were working to each other three times a day throughout the winter, we soon became firm friends. Many a happy hour have I spent "cycling," yarning with Lindberg about the state of the ice, or the chances of the Norwegian Olympic Skiing team, or any of the hundred and one things that interested us.

Up there, in North-East Land, perpetual night once more holds sway. The curtains of Aurora sweep across the sky, casting their feeble glimmer on the desolate expanses of rock and snow, and the base hut stands deserted. No slender aerials cut dark lines against the sky, no voice proclaims "This is the National Programme." For the expedition has returned to England and left the little white foxes, the bears, the reindeer and the seals the solitude which has been theirs from time immemorial.

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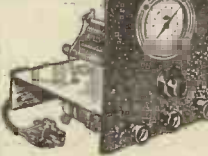
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# SEEN ON THE AIR

News and Views on the Television Programmes by our special radio-screen correspondent

L. MARSLAND GANDER

THERE seems little doubt that the Television Advisory Committee, in camera, has already been discussing a choice between the two systems used at Alexandra Palace.

However, I hear that no step will be taken until after the Coronation, a period of six months from the opening of the £110,000 station. The Coronation is expected to give a stimulus to television, and the committee feel that any change at Alexandra Palace might create unfounded doubts in the public mind prejudicial to receiver sales.

Those who have followed television development from the beginning will think it curious that the committee, after itself recommending the Siamese twin experiment in a £110,000 station, should begin to reconsider the matter so soon.

## Advantages of Single Standard

I understand that the B.B.C. contends that there can be no extension of hours until a decision has been reached on this point. This does not apply, however, to "outside" broadcasts, which must be given when the occasion presents itself—such as the Coronation.

The B.B.C. and the Television Advisory Committee are at one in desiring that a single standard of definition for television should be adopted as soon as possible. This would be a great advantage to manufacturers, chiefly because it would shorten and simplify testing and manufacturing processes. I tried to induce a leading authority to say by how much this would cheapen sets. He declined to be drawn, and would not admit that sets would be cheapened by as much as 20 per cent.

Another point about a single standard is that it would increase public confidence in television. Nevertheless, I must point out that these advantages were apparent before the double standard was adopted.

Apparatus which the B.B.C. has ordered for "outside" television is considerably more elaborate than I have indicated. A fleet of three vans is being built. One will be a control-room on wheels, the second will carry an ultra-short-wave transmitter, and the third the necessary power plant.

Mr. Gerald Cock, the Television Director, said in a recent broadcast that when this new equipment was ready it would be a great day for television. Viewers may be present by proxy at film or theatre foyers on first nights and may see celebrities arrive in London. Mr. Cock obviously did not give his imagination rein, but viewers will agree that the possibilities of the wandering television camera are great.

## An Ideal Television Turn

The fact is that he does not know—nobody knows—what can and what cannot be done with the mobile ultra-short-wave link.

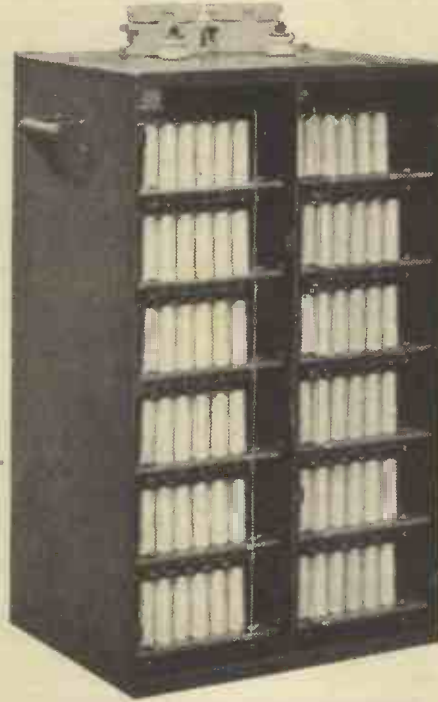
Mr. Cock chose a number of successful television artists whom, he said, they hoped to have in the studio again. He mentioned Gillie Potter, Yvonne Arnaud, Frances Day, George Robey, Billie Houston, Sophie Tucker, Russell Swann, Noni, Lou Holtz, Sherkot, the Western Brothers, Irene Prador, and Hermione Baddeley.

Among these the one who gave me the biggest laugh was Sherkot, because it was the first time I had seen his goal-keeping panto-

mime. With the co-operation of the orchestra this makes the ideal television turn.

I noticed that Mr. Cock in his broadcast was still taken up with the notion that television should be informative, but he has shifted his ground this much: instead of using the word "information" he talks about "general interest." Well, I concede the point because if he makes his information of "general interest" there can be no argument. He did not mention a point which to my mind has emerged clearly in these three months of television programmes. It is that cabaret is obviously and conspicuously the best kind of light entertainment for television.

## A GIANT CONDENSER BANK



A bank of the well-known T.C.C. Surge-Proof Wet Electrolytic Condensers mounted on removable racks and assembled into a steel tank. The total capacity of the unit amounts to 2,500 mfd. and is used for suppressing ripple on D.C. lines. This particular bank was made for use in an electric tramway station.

I welcome his decision to broadcast one-act plays and scenes from Shakespeare, but I do plead for original productions. There has, as far as I know, been only one original television play, and unfortunately I missed it.

Meaningless excerpts from stage plays I condemn. Dialect plays I detest, and for some reason are far more incomprehensible on the television screen than they are on the stage. Carefully sub-edited abridged versions giving an understandable, unutilized version of a good play are very successful on the television screen. I have in mind "Murder in the Cathedral," "The Tiger" and, more recently, "Alice Through the Looking-Glass." But in my view it is no use trying to compress a play by introducing great indigestible chunks of explanation. Television needs original plays.

"Opera and ballet," said Mr. Cock, "have not been too successful on the present small screen." In general I am inclined to agree. But have you forgotten "Façade," Mr. Cock?

I referred above to the television version of Nancy Price's "Alice Through the Looking-Glass." This was the outstanding success of the week. Ursula Hanray made an ideal Alice, mainly Victorian, inquisitive, bewildered, and sometimes indignant with the perverse looking-glass creatures.

## Experimenting With Mirrors

There was an experiment in technique with a revolving mirror which neatly converted Alice's looking-glass world into one of three dimensions. Incidentally, this suggested to the Alexandra Palace producers other "stunts" with mirrors to obtain "infinity" and other effects which may possibly figure in the programmes experimentally sooner or later. Producers might have been seen holding up mirrors to one another and making appropriate faces.

A month-old kitten born in the refreshment bar at the Palace made its first television appearance. Perhaps Humpty Dumpty, played by Esmé Percy, provided the best scene, though Tweedledum and Tweedledee (Ernest Butcher and Andrew Leigh) ran him pretty close.

"The White Coons," dressed in Co-Optimist costumes, made their first television appearance on the Saturday of this week, giving performances both in the afternoon and evening. Concert party shows have a big future in television.

This week I have been using a revised Baird receiver and have been greatly impressed with the brilliance and clarity of the picture. Improvement is particularly noticeable on the Marconi-E.M.I. transmission; the picture now spreads to the full extent of the 12 inches by 9½ inches on the screen, which is the largest on any set I have yet tested.

A number of improvements have been made in the controls. The receiver is permanently tuned to the sound; vision is tuned independently, but there is only a short turn on the condenser. There are still six main and eight subsidiary controls, but the operation of the subsidiary controls (if they need be touched at all) has been considerably simplified.

## RANDOM RADIO REFLECTIONS

(Continued from page 570.)

for he invented a something you must nearly all of you have heard about. It's brought him in a real packet, and the old gent has already got his money back, plus about ten thousand per cent. interest.

Me? On request, I sent in a bill for two hundred guineas, which I thought was reasonable enough in the circumstances. But he didn't pay it. Wrote me in on the company which was formed for a bunch of shares instead. I wasn't pleased at the time, but these shares have since brought me in a regular sum of just over four pounds per week, and it seems as if they will do so for the rest of my life, unless the sum increases, which, judging by the 1936 company report, seems likely. Not bad for one afternoon's work!

But, you see, that lad might have staged a fake demonstration to keep his backer quiet, the while he tried and tried to surmount the snag. Instead of which, he did the right thing: came to your Uncle Vic for advice and guidance. And everybody lived happily ever afterwards.



**TECHNICAL JOTTINGS**

Some items of interest

By Dr. J. H. T. Roberts, F.Inst.P.

**Those Measuring Instruments**

**M**OST wireless experimenters accumulate, during a period of years, a vast collection of junk comprising odd coils, condensers, transformers, tangled wire, and so on, euphemistically described as the junk box. In spite of its very varied assortment of odds and ends, it very seldom yields up what is required at any particular moment.

One thing which most experimenters seem to lack and which, of course, never turns up even in the best regulated junk boxes, is a measuring instrument, whether a milliammeter, voltmeter, ammeter, or what-not. It is difficult to see how any real experimenting can be done without some sort of measuring instrument.

**What Lord Kelvin Said**

I think it was Lord Kelvin who laid it down that measurement was the basis of all scientific work. I have often noticed how many people try to carry on some sort of radio experimental work without any kind of measuring instrument, and I dare say that if you ask some of your friends whether they could lend you a milliammeter or a voltmeter, you would soon find that there was a great dearth of these instruments in the district.

**You Will Take a New Interest**

It seems to me a pity that experimenters generally do not take more trouble to provide themselves with a few simple measuring instruments, because not only

will these improve the quality of their work, but also they will soon add very greatly to the interest which is to be derived from it. Working without instruments is like fumbling in the dark, whilst two or three simple instruments will prove a veritable torchlight.

**Try a Combination Instrument**

In the old days instruments were apt to be rather expensive, but during the past few years a considerable range of instruments suitable for ordinary radio work have come on the market at prices which should be quite within the reach of the ordinary experimenter. Further than this, there are various "combined" instruments which will do everything you want, act as ammeter, milliammeter, voltmeter, etc., etc., and if you are doing much experimenting one of these combined instruments is a very good investment. There are many parts of the instrument which would have to be duplicated if separate instruments were used, and in this way, by making a combined instrument, a great saving is effected. If you are at all seriously inclined I advise you to provide yourself with such a combined measuring instrument and you will be surprised to find what a new interest your experimental work takes on when you can connect in an instrument and really see what is happening.

**Grid Bias and Hum**

If the grid bias applied to an amplifying valve is not of the correct value, you may find that the grid will sometimes become positive and in consequence "hum" will be produced. If there is a conductor, carrying alternating current, very close to one of the conductors of the amplifier, especially if the latter conductor happens to be the grid lead, there will be great danger of hum being set up, owing to the capacity coupling between the grid and the lead which is carrying the alternating current.

**Balancing the Filament**

Talking about A.C. hum, a point which is often overlooked relates to the centre-tapping of the filament winding for a triode valve with A.C. heating. As you probably know, the "centre" tapping is made to the "electrical" centre of the secondary of the heating transformer, so as to "balance" the filament. I should mention that the finding of this electrical centre is not a particularly easy matter, owing to the fact that there are only a few turns of wire on the output of the transformer, so that a very small shift in the tapping point will make a good deal of difference to its "electrical" position. The reason why there are only a few turns of wire on the output of the transformer is simply because the voltage which is required to be produced at the terminals of the filament transformer is only a low voltage.

**Finding the Electrical Centre**

It may be that you cannot "get at" the centre of the winding, and in such a case a simple method to tap off the electrical centre is to connect a suitable resistance across the terminals of the transformer winding and then, using this resistance as a

(Continued on next page.)

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**SWITCHES.** Bulgin, 1/6; push-pull triple short circuit, 2/-; Benjamin, 1/3; push-pull, 9d. Sovereign, 1/-; 3-point, 9d. Utility, 4/6; 2-pole O.O. push-pull, 1/6. 2-gang, 3/-. Toggle lighting switch, 10 amps, 1/6. Tunewell, 1/9; on-off Rotary Switch, 1/-.

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**THE SUPERSIDER.** Makes H.T. from your L.T. 2-volt battery, rectified and smoothed, 3 tappings. Lasts indefinitely. A boon. List £3/15/-. New, guaranteed, 37/6.

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'Phone: Central 4611.

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The Finest Permanent Magnet Loud-speakers on the market, supplied on lowest terms. 3TS: Cash or C.O.D. 42/-, or 2/6 down and 11 monthly payments of 4/-.

**GARRARD TYPE "B" RADIOGRAM UNIT**

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PROMPT DELIVERY. Anything and everything Radio supplied on lowest terms.

THE LONDON RADIO SUPPLY CO., LTD., 11, Oat Lane, Noble Street, London, E.C.2.

## TECHNICAL JOTTINGS

(Continued from previous page.)

potentiometer, to move a sliding contact on the resistance until you get the required balance. This is not quite the same thing as the other, and involves an otherwise unnecessary load on the output of the transformer; but, on the other hand, it has the advantage that it can be used with a transformer which is already made up and, furthermore, the tapping point can be shifted whilst the circuit is *actually in operation*, so that you can find out by ear the best position for the slider.

### 'Ware Voltage Drop

The centre tapping is connected to earth, either directly or through a resistance. If it is connected through a resistance there will be a voltage drop in this resistance and consequently, if you connect the end of the resistance nearest to earth to the grid circuit of the valve, through a suitable resistance, you will have a means for the automatic adjustment of the grid bias; the bias will increase automatically with the anode current in the valve.

The grid circuit of the valve should be connected to the other end of the resistance through a decoupling condenser.

### Two Output Valves

What I have just said above refers to a single output valve, but if two output valves are used it will be better to heat the two filaments from two separate heater windings, as in this way you can make the corresponding arrangements for the separate adjustment of each valve, whereas if the two filaments are heated from the one transformer winding, you can only adjust them, by this method, simultaneously.

### Changes in Inductive Value

When you get alternating-current hum in a receiver another possible cause, apart from those discussed above, is lack of sufficient smoothing by the smoothing chokes. Several of the components on the market are, I am sorry to say, rated much too optimistically and will not maintain their specified inductive value, or anything like it, when carrying an appreciable current. It will pay you to go in for good quality chokes and condensers, because if you buy an inferior article you never know whether it is really doing its job, and ten to one you will eventually, after endless trouble, have to throw it out and buy a proper one, which you might better have done in the first instance.

### A Cause of Interaction

There are always some parts of a radio circuit which are common to all the valves, and this is one of the things that leads to interaction between different parts. As you know, interaction is a thing to be avoided, because if it becomes appreciable it will cause the circuit to become unstable and this is how you get the various forms of oscillation, of which motor-boating is one of the best-known.

The way to avoid all this is to decouple the various parts of the circuit which are liable to couple themselves together.

### Use of Decoupling

Decoupling has been defined as the use of various methods for preventing stray

alternating currents getting from one part of a radio circuit to another and sending these currents to earth instead.

There are a number of dodges used in decoupling, generally involving a resistance and condenser, the resistance and capacity of which depend upon the part of the circuit in which they are to be used.

The high-tension battery is usually common to the anodes of all the valves, and consequently it is advisable to decouple separately the different high-tension positive leads.

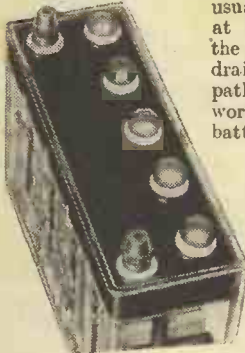
In some sets the grid circuits need attention, whilst in most mains sets the bias circuit is decoupled.



Up-to-the-minute news concerning the radio industry

### NEW EXIDE DEVELOPMENT

**M**AKERS of high-tension accumulator batteries have always been up against the problem of surface leakage. When a large number of batteries are being charged simultaneously, as, of course, happens in the average charging station, the atmosphere surrounding the batteries contains a fine acid spray, some of which settles on the sealing compound covering the tops of the batteries. When the water in the acid film thus formed evaporates, there is left a concentrated film of acid which provides a small leakage path for current. As high-tension batteries are usually only charged at infrequent intervals the continuous slight drain across this leakage path reduces the useful working capacity of the battery.



An Exide H.T. unit showing the leakage shields fitted round positive and negative terminals.

Exides have overcome the trouble in an ingenious manner by providing their latest 10-volt wet high-tension units with a leakage current shield fitted round each of the battery terminals. The shield consists of a porcelain collar embracing the terminal post and an air gap is left between the terminal and the shield. Tests by the makers have proved that batteries equipped with these shields have a longer useful working life than other batteries of similar capacity not so equipped.

### S.T.800 COIL UNIT

Messrs. British Television Supplies announce that owing to the increase in the price of raw materials they have been reluctantly compelled to increase the price of the B.T.S. "Quadwave" Tuner for the S.T.800 to 23s. 6d. This price change takes effect as from January 18th. We are informed, however, that all orders sent to Messrs. B.T.S. prior to that date will be executed at the old price of 21s. 0d.

### INDIAN BROADCASTING EXPANDS

Four 10-kilowatt short-wave transmitters are to be supplied by Philips Radio for the

All India Radio Organisation. When completed these new stations will work on a wavelength between 30-90 metres.

There are already in India five medium-wave stations and four short-wavers, in addition to a number of local relay transmitters.

### NIVEX TIME SWITCH

The knowledge that your radio set can be switched on quite automatically at a pre-determined time so as not to miss some specially desired programme is an attractive one.

It can be readily achieved with the aid of one of the special time switches made by the Nivex Instrument and Gauge Company, of 280, Deansgate, Manchester.

The Nivex switch costs 19s. 6d. and, in addition to switching on the radio, it can be used for a variety of other purposes, such as controlling lights, switching on an electric kettle at a given time for the morning cup of tea, and for heating the shaving water with the aid of an immersion heater at exactly the right time.

Further details are available from the address given.

### LATEST MURPHY RELEASES

This week there is a fairly big batch of set releases to announce.

The first of the new 1937 Murphy models are now available. These are two battery sets and a table mains model (available for A.C. or A.C./D.C. use).

The less expensive of the battery models is the B31, which costs £6 10s. 0d., without batteries. This is a straight H.F. receiver utilising a three-valve circuit in the order—variable mu H.F. pentode, leaky grid detector, and output pentode.

There is automatic grid bias and special constant reaction circuit. The H.T. consumption at 120 volts is approximately 7 milliamps., and the L.T. consumption half an ampere.

Next there is the B33, priced at £10 15s. 0d. without batteries. This is a superhet incorporating a triode pentode frequency changer, variable-mu I.F. pentode, double-diode-triode, and Q.P.P. pentode-output valve.

Here again automatic grid bias is employed, and the H.T. consumption is approximately 8.5 milliamps. at 120 volts, and normal output. The L.T. consumption is 1 ampere.

A new tuning scale is fitted to this model and has 60 station names in alphabetical order on an open dial specially designed for convenience and legibility. Simplified tuning is a feature of this new dial.

The mains receiver costs £11 10s. 0d., and is known as the A34. It is an A.C. set embodying a superhet circuit.

There is a cathode-ray tuning indicator, and an inter-station noise suppression circuit. Heterodyne whistles and side-band splash are eliminated by the use of a new type of whistle filter, and the new alphabetical dial, which is used in the B33 model, is also fitted.

An alternative set for those who desire a universal mains model is the D34, which also costs £11 10s. 0d. This is of the same general design and appearance as the A34.

The A34, D34 and B33 models have cabinets with slightly sloping fronts.

### PYE "Q" SERIES

In the Pye range there are four new releases. These are the first of the "Q" series. All the models introduced during this year are to have the prefix Q. Letters A.C., B (battery) or U (universal), and a numeral to denote the number of wavebands are also used.

The first set is the Q.AC5, which means, of course, that this model is an A.C. set covering

(Continued on next page.)

## THE RADIO BULLETIN

(Continued from previous page.)

five wavebands. It is a six-valve superhet (including rectifier) for use with an outside aerial and, in addition to the medium and long waves, covers the wavebands of 6-11 and 11-25 metres and 24-70 metres, thus embracing the television sound broadcasts.

It is a set having many refinements, such as quiet delayed A.V.C., illuminated tuning and overloading indicator, a four-position tone control, and a flywheel drive tuning control. It costs 18 guineas.

Then there is the Q.AC3, a five-valve superhet (including rectifier) covering the 16.5-52 metres waveband, in addition to the usual medium and long wavebands. This model has an electric-eye tuning indicator and a line-light station indicator, among other special features.

Also, the moving coil loudspeaker is of the oval type, and is claimed to give exceptional fidelity on speech and music. The price of this set is 13 guineas and it is interesting to note that the cabinet design of this model is due to Michael Dawn, one of the leading furniture designers of to-day.

This particular cabinet is available in two different styles of wood and finish, namely, figured walnut with satin finish, and Australian walnut veneer with wax finish.

Next, there is the Q.TRF, a tuned radio-frequency battery set, covering the short waves as well as the normal broadcast bands. A Droitwich filter is incorporated and the pentode output gives 200 milliwatts of undistorted power. This set, complete with batteries and accumulators, costs £8 5s. 0d.

Last, but by no means least, there is Q.AC2, a five-valve superhet (including rectifier) covering the normal broadcast wavebands and costing only 8 guineas.

It is fitted with full delayed A.V.C., an illuminated tuning dial and three-point tone control. There is provision for an external speaker and the undistorted output is 2½ watts.

\* \* \*

## NEW BURNDIPT MODEL

Burndipts have just released a luxury eight-valve all-wave A.C. superhet costing 18 guineas. The output of this set is 3½ watts and it is fitted with variable tone control, inter-station noise suppression, an illuminated scale calibrated on all wavebands in wavelengths and cycles.

Special Litz wound iron-core coils are used in the tuning circuits and the seven tuned stages are operative on all wavebands. This set is known as the Model 259.

\* \* \*

## LISSEN TRANSPORTABLE

From Lissens we learn of a new A.C. mains transportable. This is a four-valve set (including rectifier) and, of course, relies for its reception on a self-contained frame aerial.

It has a moving-coil speaker and provision for a pick-up and external aerial and earth. The price is 10 guineas.

\* \* \*

## A 60-WATT AMPLIFIER

Public address work is now a very important branch of entertainment. Correx amplifiers of Brixton, London, are marketing a new P.A. unit, giving an output of 60 watts.

The amplifier is supplied in two forms, either as an amplifier and fading and mixing control panel, with provision for four separate inputs, or as a complete gramophone amplifying equipment built into a robust oak cabinet with turntable and pick-up combined.

Class A/B amplification is employed and provision is made for the use of a pre-amplifier if desired.

The price is 65 guineas, or when fitted in oak cabinet as a complete gramophone amplifier the price is 70 guineas.

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ACCESSORIES

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## SOUTHERN RADIOS WIRELESS BARGAINS.

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**RECEIVERS.—BELMONT.** 6-Valve Superhet Receivers, complete in handsome cabinet with moving-coil speaker and six valves. For use on A.C./D.C. mains 100/250 volts. Ready for use on any mains, 64.  
**VIDOR.** 3-Valve Battery Sets. Model C.N.212. Complete in attractive Walnut Cabinet with three Mullard Valves, Moving-Coil Speaker, Batteries and Accumulator. New, in sealed cartons, £3 17s. 6d. (List, 64 gns.)

**LUCILLE.** 5-Valve American Midget Sets. Complete with 5 Valves. Moving-Coil Speaker. Ready for use on any mains 100/250 volts A.C./D.C. Long and Medium Waves, £3 15s. 0d. New, in sealed cartons.

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**COLLARO Electric Radiogram Units,** complete with Pick-up and fully Auto Stop, for A.C. Mains only, 37/6 each.

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**Double Spring Motors** with 12-in. turntable, 15/-.

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**TELSER permanent magnet,** with 10-ratio Transformers to suit any Receiver, 12/6.

**Telsen Loud-Speaker Units,** 2/6. All Brand New and Boxed.

**COILS.—Telsen Iron Core,** W.349 (Midget size), 4/-.

**Type W.478 (Twin),** 9/- pair. **Type W.477 (triple),** 16/- per set. **Type W.476 (triple Superhet, Selector and Oscillator),** 16/- per set. All ganged coils complete on base with switch. **Telsen I.F. Transformer Coils,** 110 kc., 5/-.

**Telsen Dual Range Coils,** with aerial series condenser incorporated, type W.76, 4/-.

**Telsen Aerial condensers** with shorting switch, 2/-.

**All Telsen components** Brand New in sealed cartons.

**CAR RADIO AERIALS.—Ekco** copper mesh aerials can be used on roof or floor of car, 36-in x 20-in., 4/-; 36-in. x 20 in., 5/-.

**AMERICAN VALVES.** A full range of valves for all American receivers, 6/- each.

**MISCELLANEOUS BARGAINS.—All brand new** in original sealed cartons: **Telsen A.C./D.C. Multimeters,** test anything radio or electrical, 8/6. **Telsen 2-range Voltmeters,** 3/-; 3-range meters, including milliamps., 4/-.

**Ace (P.O.) Microphones,** with transformer ready for use with any receiver, 4/6; 36 assorted Tru-ohm Resistances, 1 watt, colour-coded and marked, 36 on card, 6/- per card. **Bell Transformers,** 200/250 volts input, 3, 5 and 8 volts output, 3/6; **Morse Signal Units,** incorporating buzzer, tapper and flash with international code, complete with batteries and bulb, 3/9 each. **Varley Square Peak Coils,** B.P.5, 2/-; **Marconi V.24** and **Q** type valves (useful for short-wave experiments), 1/6; **glass insulators,** 4d. **Lightweight headphones,** double pole, 4,000 ohms each ear piece, 3/- pair. **A.C. Trickle Chargers,** for 2, 4 and 6 volts, 17/6.

**CAR and RADIO BATTERY CHARGERS,** incorporating Westinghouse Metal Rectifier. This Charger will enable you to keep your car batteries fully charged, for use on 2, 6 and 12 volts, 45/- each.

**REGENTONE ELIMINATORS, A.C.,** 200/250 volts, type W.5a, with trickle charger, 37/6.

**SOUTHERN RADIO.** Branches at 271-275, High Road, Willesden Green, N.W.1.; 46, Lisle Street, London, W.C.2. All mail orders to 323, Euston Road, London, N.W.1.

**SOUTHERN RADIO,** 323, Euston Road, London, N.W.1 (Near Warren St. Tube). 'Phone: Euston 3775.

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(Continued)

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**CRYSTAL SETS.** Burne-Jones. Complete. Guaranteed, 5/6. Ditto, double circuit, 8/-. With permanent detector, 1/- extra. Sensitive permanent detectors, 1/6. **Crystal detectors.** Complete parts, 1/-.

**Crystal, 6d.** Post Radio, 183, Caledonian Road, London, N.1.

**S.T.800.** Kits A exact to specification, £3 7/6. A.C. versions, £8. **Radio Goods.** Lowest Prices. Part Exchanges.—**Servwell Wireless Supplies,** 64, Prestbury Road, London, E.7.

**CONVERSION UNITS** for operating D.C. Receivers from A.C. Mains, improved type, 120 watts output at £2 : 10 : 0. Send for our comprehensive list of Speakers, Resistances and other components.

**WARD,** 46, Farringdon Street, London, E.C.4. Tele.: HOLborn 9703.

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**A THOUSAND BARGAINS**  
**MAINS TRANSFORMERS, M.C. SPEAKERS, MAINS VALVES, SHORT-WAVE GEAR, CABINETS, ETC.**

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20-22, HIGH STREET, CLAPHAM, S.W.4.  
SEND 3d. STAMP FOR CATALOGUE.

**RECEIVERS FOR SALE**

**S.T.800 A.C. Receiver** portion only, less valves, 30/-.

**T. Thorne,** 28, Clovelly Avenue, Hendon, N.W.9.

**MISCELLANEOUS**

**GRAMOPHONE Attachments** for Radio, electric motors, 25/-; Pick-ups, 9/6; **Portable Gramophones,** 12/-; **spring motors,** 4/6, dozen, 36/-, 100, £12/10, 1,000, £100; **walnut pedestal Anexagram,** £5. **Soundboxes, tonearms, horns, cabinets, needles, gears, springs, accessories** cheapest. Lower prices for quantity buyers. Catalogue free.—**Regentpop,** 120, Old Street, London, E.C.1.

**HIGH CLASS Radio Cabinets** made to order. **C. Mostyn, Ltd.** (Cabinet Manufacturers), 8-9, French Place, London, E.1. (Bishopsgate 8784.)

**BESTERTH Patent Earthing System** is best for long or short waves. For particulars write **John Holmes & Sons,** 16, Isleworth Drive, Chorley, Lancs.

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**WANTED** Young Man for sales counter Wireless and Electrical Sundries. Write, stating experience and salary required, to **Box A.493, c/o Jackson's,** 45, Fenchurch Street, E.C.3.

**POST OFFICE ENGINEERING.** Excellent openings for young men age 18-23. Start £3.13.0 weekly at age 18. No experience required. **FREE** details of exams. from **N.I.E. (Dept. 606),** Staple Inn Buildings, High Holborn, W.C.1.

**G.P.O. ENGINEERING DEPT.** (no experience required). Commencing £3.13.0 per week. Age 18-23. Excellent prospects. **Free details of Entrance Exam.** from **B.I.E.T. (Dept. 568),** 17-19, Stratford Place, London, W.

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## "P.W." LIST OF EUROPEAN BROADCASTERS

This list contains the more important European medium and long-wave stations which are likely to be received in this country. There are some relay stations working on very low power and sharing common wavelengths. These have been omitted because their programmes are usually too weak or badly interfered with to be of value to British listeners.

WAVE-LENGTH.	STATION. MEDIUM WAVEBAND.	COUNTRY.	POWER KW.	WAVE-LENGTH.	STATION. MEDIUM WAVEBAND.	COUNTRY.	POWER KW.
203.5	Plymouth .. ..	Gt. Britain ..	0.3	356.7	Berlin .. ..	Germany ..	100
203.5	Bournemouth .. ..	" .. ..	1	360.6	Kiev .. ..	U.S.S.R. ..	35
206	Eiffel Tower (Paris) ..	France .. ..	5	364.5	Bucharest .. ..	Rumania ..	12
215.4	Radio-Lyons .. ..	" .. ..	25	368.6	Milan (No. 1) ..	Italy .. ..	50
233.5	Aberdeen .. ..	Gt. Britain ..	1	373.1	West Regional ..	Gt. Britain ..	70
236.8	Nürnberg .. ..	Germany .. ..	2	377.4	Lwów .. ..	Poland .. ..	50
238.5	Riga .. ..	Latvia .. ..	10	382.2	Leipzig .. ..	Germany ..	120
240.2	Saarbrücken .. ..	Germany .. ..	17	386.6	Toulouse (P T T) ..	France .. ..	120
241.9	Cork .. ..	Irish Free State ..	1	391.1	Scottish Regional ..	Gt. Britain ..	70
243.7	Gleiwitz .. ..	Germany .. ..	5		Burghead .. ..	" .. ..	60
245.5	Radio Marconi (Bologna) .. ..	Italy .. ..	50	395.8	Katowice .. ..	Poland .. ..	12
247.3	Lille (Radio P T T Nord) .. ..	France .. ..	60	400.5	Marseilles (P T T) ..	France .. ..	90
251	Frankfurt .. ..	Germany .. ..	25	405.4	Munich .. ..	Germany ..	100
253.2	Nice-Corse .. ..	France .. ..	60	410.4	Tallinn .. ..	Estonia .. ..	20
255.1	Copenhagen .. ..	Denmark .. ..	10	415.4	Kharkov (No. 1) ..	U.S.S.R. ..	10
257.1	Monte Ceneri .. ..	Switzerland .. ..	15	420.8	Rome (No. 1) .. ..	Italy .. ..	50
259.1	Kosice .. ..	Czechoslovakia ..	10	426.1	Stockholm .. ..	Sweden .. ..	55
	West National .. ..	Gt. Britain .. ..	20	431.7	Paris (P T T) .. ..	France .. ..	120
261.1	North National .. ..	" .. ..	20	443.1	Sottens .. ..	Switzerland ..	100
	London National .. ..	" .. ..	20	449.1	North Regional .. ..	Gt. Britain ..	70
263.2	Trieste .. ..	Italy .. ..	10	455.9	Cologne .. ..	Germany ..	100
265.3	Hörby .. ..	Sweden .. ..	10	463	Lyons (P T T) .. ..	France .. ..	100
267.4	Newcastle .. ..	Gt. Britain .. ..	1	470.2	Prague (No. 1) ..	Czechoslovakia ..	120
269.5	Radio Normandie (Fécamp) .. ..	France .. ..	10	476.9	Lisbon .. ..	Portugal .. ..	15
269.5	Moravska-Ostrava ..	Czechoslovakia ..	11.2	476.9	Trondelag .. ..	Norway .. ..	20
271.7	Kuldiga .. ..	Latvia .. ..	50	483.9	Brussels (No. 1) ..	Belgium .. ..	15
274	Vinnitsa .. ..	U.S.S.R. .. ..	10	491.8	Florence .. ..	Italy .. ..	20
278.6	Bordeaux-Lafayette ..	France .. ..	12	499.2	Sundsvall .. ..	Sweden .. ..	10
283.3	Bari (No. 1) .. ..	Italy .. ..	20	499.2	Rabat .. ..	Morocco .. ..	25
285.7	Scottish National ..	Gt. Britain .. ..	50	506.8	Vienna .. ..	Austria .. ..	100
288.5	Rennes-Bretagne .. ..	France .. ..	120	514.6	Madona .. ..	Latvia .. ..	50
291	Königsberg (No. 1) ..	Germany .. ..	100	522.6	Stuttgart .. ..	Germany ..	100
296.2	Midland Regional ..	Gt. Britain .. ..	70	531	Athlone .. ..	Irish Free State ..	60
298.8	Bratislava .. ..	Czechoslovakia ..	13.5	539.6	Beromunster .. ..	Switzerland ..	100
301.5	Hilversum (No. 2) ..	Holland .. ..	60	549.5	Budapest (No. 1) ..	Hungary .. ..	120
304.3	Torun .. ..	Poland .. ..	24	559.7	Wilno .. ..	Poland .. ..	16
304.3	Genoa .. ..	Italy .. ..	10	569.3	Viipuri .. ..	Finland .. ..	10
307.1	Northern Ireland Regional .. ..	Northern Ireland ..	100				
312.8	Poste Parisien .. ..	France .. ..	60	1107	Moscow (No. 2) ..	U.S.S.R. ..	100
315.8	Breslau .. ..	Germany .. ..	100	1153.8	Oslo .. ..	Norway .. ..	60
318.8	Goteborg .. ..	Sweden .. ..	10	1250	Kalundborg .. ..	Denmark .. ..	60
321.9	Brussels (No. 2) ..	Belgium .. ..	15	1293	Luxembourg .. ..	Luxembourg ..	150
325.4	Brno .. ..	Czechoslovakia ..	32	1339	Warsaw (No. 1) ..	Poland .. ..	120
328.6	Toulouse .. ..	France .. ..	60	1379	Novosibirsk .. ..	U.S.S.R. ..	100
331.9	Hamburg .. ..	Germany .. ..	100	1389	Motala .. ..	Sweden .. ..	150
335.2	Helsinki .. ..	Finland .. ..	10	1500	Droitwich .. ..	Gt. Britain ..	150
338.6	Linz .. ..	Austria .. ..	15	1571	Deutschlandsender ..	Germany ..	60
342.1	London Regional ..	Gt. Britain .. ..	70	1744	Radio-Paris .. ..	France .. ..	80
345.6	Poznan .. ..	Poland .. ..	16	1807	Moscow (No. 1) ..	U.S.S.R. ..	500
349.2	Strasbourg .. ..	France .. ..	100	1875	Lahti .. ..	Finland .. ..	150
				1875	Radio-Rumania ..	Rumania .. ..	150
					Hilversum (No. 1) ..	Holland .. ..	100

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# Popular Wireless

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G.P.O. AS A NEWSPAPER

*and* TELEVISION TIMES



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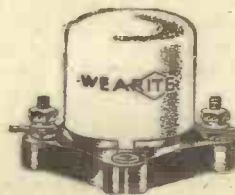
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# POPULAR WIRELESS

## AND TELEVISION TIMES

Editor: G. V. Dowding.

Asst. Editors: A. Johnson-Randall, A. S. Clark.

ARABIAN NIGHTS  
NIGG-LING  
WELSH CRY

### RADIO NOTES & NEWS

BAND OF HOPE  
O.K. FOR SOUND  
U.S.A.'s FLOODS

#### The First Wireless Prophecy

“WHAT’S all this about wireless being prophesied in 1700 and something?” asks W. T. L., of the C.T.O., on reading my recent Note about the first wireless prophecy.

“John Baptista Porta,” he says, “described a ‘sympathetic’ telegraph in 1558. In 1665 Joseph Glanvil foretold communication by means of a ‘sympathetic’ telegraph.”

Moreover, he continues: “Re your correspondent’s reference to a Biblical quotation, Porta’s idea was to use the Lodestone (natural magnet) and two needles. Well, the Chinese were acquainted with the stone’s properties some 2,500 years B.C., and they actually used it at sea about A.D. 300. Wha’ ‘ja know about that?”

To which I rejoin that the wily Orientals are credited with having used the lodestone for a navigational magnet, but never, so far as I can learn, for any kind of wireless. So what?

#### Arabian Nights

SPECIAL broadcast programmes and news directed to Arabs in Syria, Palestine and Iraq are to be included in the forthcoming transmissions from the Turkish radio stations. Other interests, say the Turks, have been misrepresenting the Turkish point of view to these Arabs, and the new policy is intended as a counterblast.

Few of us had supposed that radio receivers were among the camp impedimenta which are nightly folded up by the Arabs when they silently steal away. But that great benefit will be derived from the new scheme is confidently averred by the Turkish ruler, President Ataturk.

Atta Boy, say I. Mustapha go, anyway.

#### Filleted Felicity

WRITING from “Hollis,” Pointon, Sleaford, Lincs., Mr. C. B. Raithby, who is known on the air as G 8 G 1, makes a sporting offer.

He says: “I have for disposal two or

three hundred “P.W.’s” and a few other wireless books. I should be pleased to post them in lots—no particular order—to anyone (or ones) who cares to send me the postage for them. (Parcel rate would not cost much.) It seems a pity to waste them.”

BUT—there is one snag! Every free copy of “P.W.” will be found to have its “W. L. S.’s” page—or two pages—neatly removed! And nothing you can say will persuade Mr. Raithby to part with them! It seems to me that all unwittingly this has turned itself into a pretty com-

rejoiced exceedingly at this cryptic rejoinder, for they knew what “Nigg” meant. It is the name of a place just outside Aberdeen, where there is a fine site for a 5-kilowatt station, soon to be erected. Five kilowatts for Nigg are better than one niggling kilowatt in Aberdeen.

#### Third Network for U.S.A.

AS you know, the broadcasting system of the U.S.A. is not a Government controlled monopoly like ours, but is a profit-making competitive business, paid for by radio advertising.

Until recently there were two big coast-to-coast networks, belonging to the National Broadcasting Corporation and to Columbia Broadcasting System respectively. Now the Mutual Broadcasting System has acquired the Don Lee Network of California as well as the Iowa and Central States network, thus making a third big system extending from the Atlantic to the Pacific.

The Mutual folks are very pleased at having acquired equal status with Columbia and National. This pleasure, however, is not mutual!

#### Cry From a Welsh Heart

JUST a postcard, received not long ago at the B.B.C.’s Cardiff station:

“Will you kindly give us something lively in music as we are melancholy enough now without your chambers music in four movements, etc., violin and piano, etc. Give us some brass, and also not so much of news. I am paying you to liven me up a bit, not to kill me in slow motion. If you keep on the stuff as you giving us this last few days between the crises of the country you will be issuing coffins with that duff you broadcasting now and if you do send anything good you comments when it is on and enjoying yourselves and not the listeners for the love of mike give some pep into it.”

This proves that it’s not essential to punctuate in order to discriminate!

(Please turn to page 610.)

#### WITHOUT HIS BLACK-FACE MAKE-UP



NOSMO KING, the well-known radio artist, with his Cossor set. The name Nosmo King was derived from the words “No Smoking” seen in an hotel lobby.

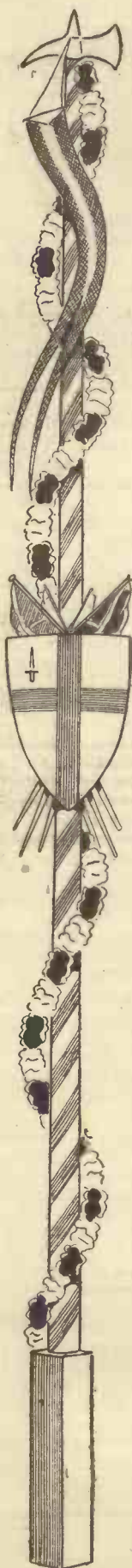
pliment to my colleague “On the Short Waves.” It is a true believer who will literally “take a leaf out of his book” every week!

#### Nigg-ling

CITIZENS of Aberdeen were not altogether enthusiastic about the transfer to the new Burghead station of the radio supremacy of the north, hitherto held by Aberdeen. So they asked the B.B.C. what about a few more kilowatts for the city of Aberdeen.

The B.B.C., not in any niggling mood, said “Nigg.” And the Aberdonians

THE SUPER CENTURION-OVERLEAF



# MY CORONATION SET



THE question: "How many valves should a set have?" is as old as broadcasting itself. This may be a useful opportunity for considering the pros and cons of the various types of receivers. The Super Centurion has three valves, while the S.T.800 has four. Why should there be a difference in the two sets? The obvious reply is that they are intended to cater for different publics, and different performances. But the detailed reply is by no means as simple as all this, and in any case no one wants to feel that he is getting poorer results because he is paying less. Unless the receiver were frankly a local station set, and this were made very clear at the time, I should not offer a receiver with poor performance as regards foreign stations merely because there was a public which did not want to pay the full price of a good set.

It is an old saying that you pay for what you get, and this no doubt applies to a very large number of products, but I am not at all sure that price is a reliable criterion of a wireless receiver. We all have our suspicions, sometimes, that some of the low-priced commercial sets are just as good as the same firm's more expensive models and that the extra price is calculated to rope in snobbish people who feel that they must have the best at literally all costs. Of course, there may be a few modifications as regards the cabinet and insignificant details, but frequently the same circuit and perhaps even the same chassis is incorporated.

### Choosing a Set

The designer's attitude towards his prospective set is governed by the requirements of the public for which he is catering. The lazy thinker may imagine that price considerations are almost entirely the only ones in radio receiver design. As regards the majority of commercial sets, I think price is almost entirely the governing factor; very few people who buy a ready-made wireless set know anything about its features. They buy on the strength of the name, the publicity (which is often the same thing), and the price. A higher priced set must, they think, be a better set. All this is rather deplorable. I should like to see people buying ready-made wireless sets for special purposes, as no set can provide all the best features unless it is really expen-

## THE SUPER

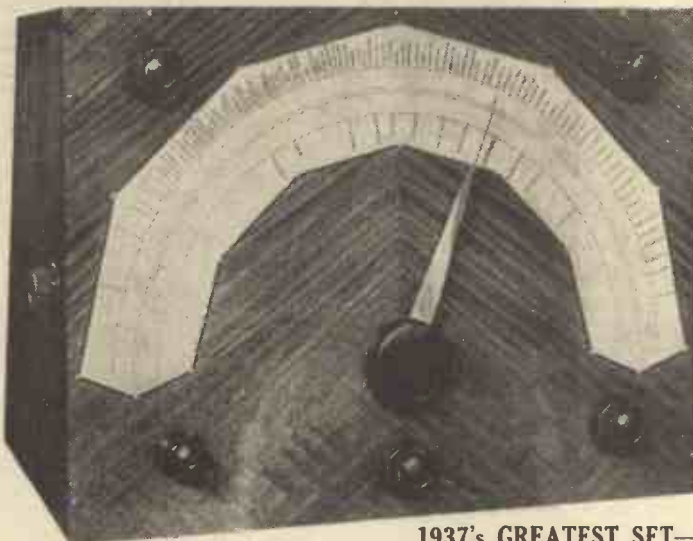
REMEMBER THE TERRIFIC SUCCESS OF THE FIRST CENTURION? WELL, HERE IS AN ENTIRELY NEW VERSION, JUST AS ECONOMICAL AND EASY TO BUILD AND USE, BUT EVEN MORE WONDERFUL IN ITS PERFORMANCE

sive. A receiver designed to give superlative quality on the main stations and where very large volume is desired is almost essentially a special job. On the other hand, a receiver for the reception of short waves is a more highly specialised piece of work. Sets which will receive only the medium and the long waves and sets which are so-called all-wave models involve considerable differences in design and, given a certain amount of money to spend, a better set could be produced for simply the two wave-

bands. There are one or two firms who go in for particularly high-grade quality, and think nothing of sticking on another twenty pounds for this feature.

### Special Features

The home constructor is a much more shrewd person. He knows what to look for even if he doesn't know quite what he wants. If I leave out audio reaction on the S.T.800—a feature which was so praised and starred in the S.T.700—he wants to know why. If high-frequency reaction is used on two circuits in the



**1937's GREATEST SET—**  
By the introduction of aerial reaction, enormous amplification is achieved without the expense of an extra valve.

S.T.600 but not in the S.T.700 or S.T.800 he again wants to know why. What about reaction equalisation—which was a feature of the S.T.400—although I honestly do not believe that anyone got it to work. The fact that if it didn't work the set could still give good results, is perhaps the best argument in favour of leaving it off in later sets, although I still think that it is a valuable feature.

Here we have to consider the difference between essential features and those which add to the convenience of operation or are in the form of luxury additions. Now, obviously, if I sat down and planned to give you

!!! A TRIUMPH OF ECONOMY AND SIMPLICITY !!!