



Vol. XI No. 276

Registered at the G.P.O. as a Newspaper.

FRIDAY, NOVEMBER 7, 1930

Two Pence

PRINCIPAL CONTENTS

Empire Broadcasting
Present Position

Armistice Day 1930

The Romance of Short Waves
By Prof. E. V. Appleton, F.R.S.

A Short-Wave Superheterodyne Adaptor

WORLD-RADIO

Station Identification Panel

PRAGUE (Czechoslovakia)

(Revised)

Frequency: 617 kc/s.
Wavelength: 487 m.
Power (aerial): 5.5 kW.
Approximate Distance from London:
640 miles.

Opening Call: "Haló! Radio-Praha vysílá. . .!" in Czech, German, French, and English. (Czech is unlike either the Latin or Teutonic languages, but more akin to Russian and Polish.)

Interval Call: "Haló! Praha! Dámy a pánové, slyšeli jste . . . nyní uslyšíte . . ."

Man and woman announcers.

Concludes programme with "Radio-journal Praha končí vysílání a přeje všem posluchačům doma i za hranicemi příjemnou dobrou noc!" ("Good-night!")

Relay Stations.

Brno (878 kc/s; 342 m.; 3 kW.).
Bratislava (1,076 kc/s; 279 m.; 14 kW.).
Košice (1,022 kc/s; 293 m.; 2.5 kW.).
Moravska-Ostrava (1,139 kc/s; 263 m.; 11 kW.).

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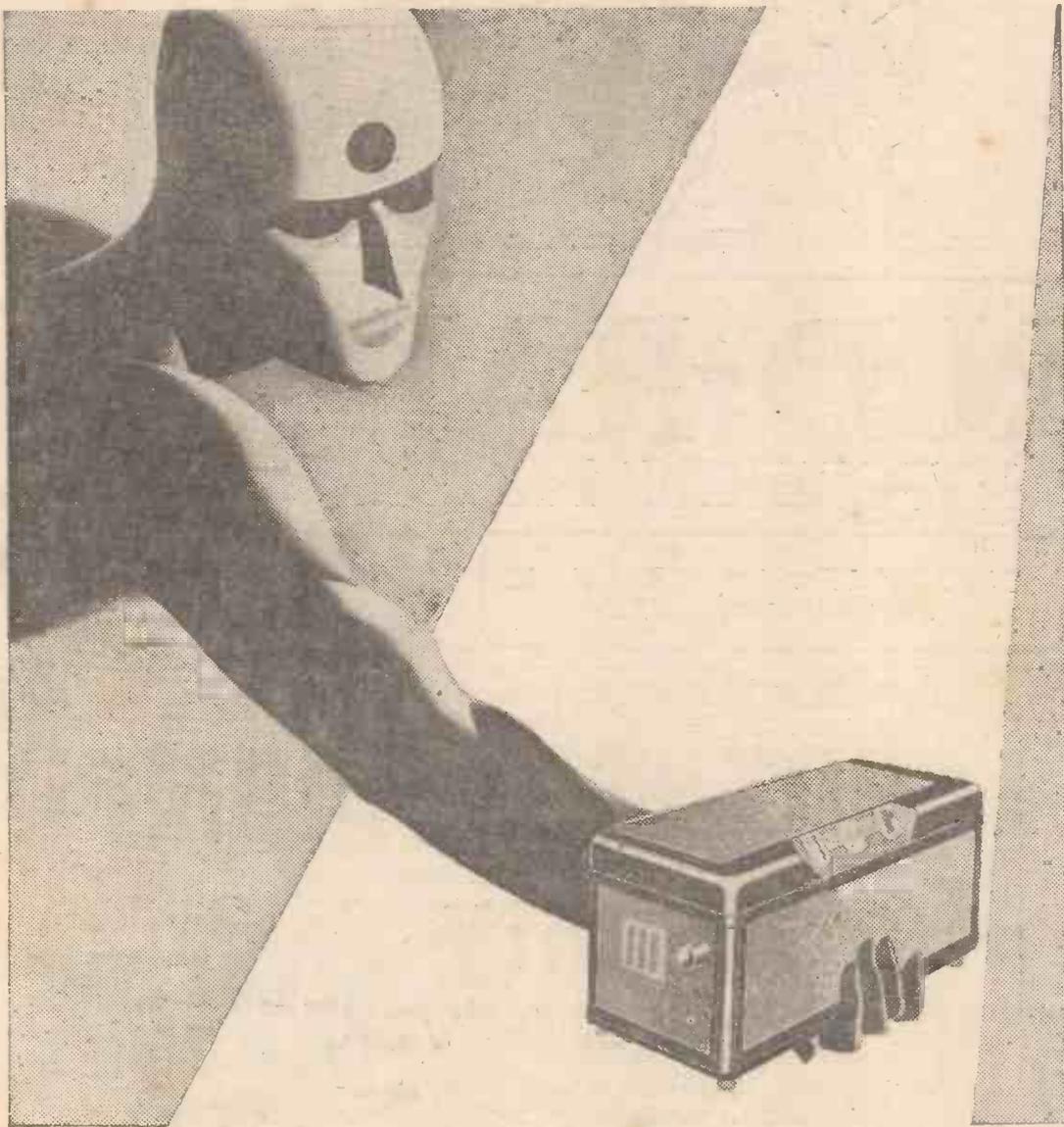
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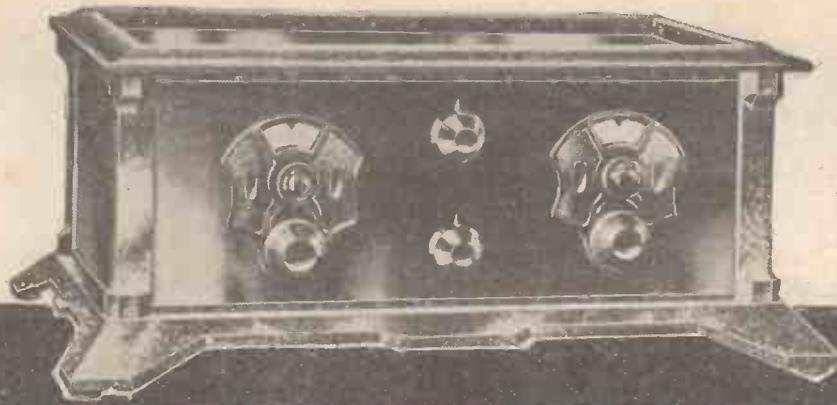
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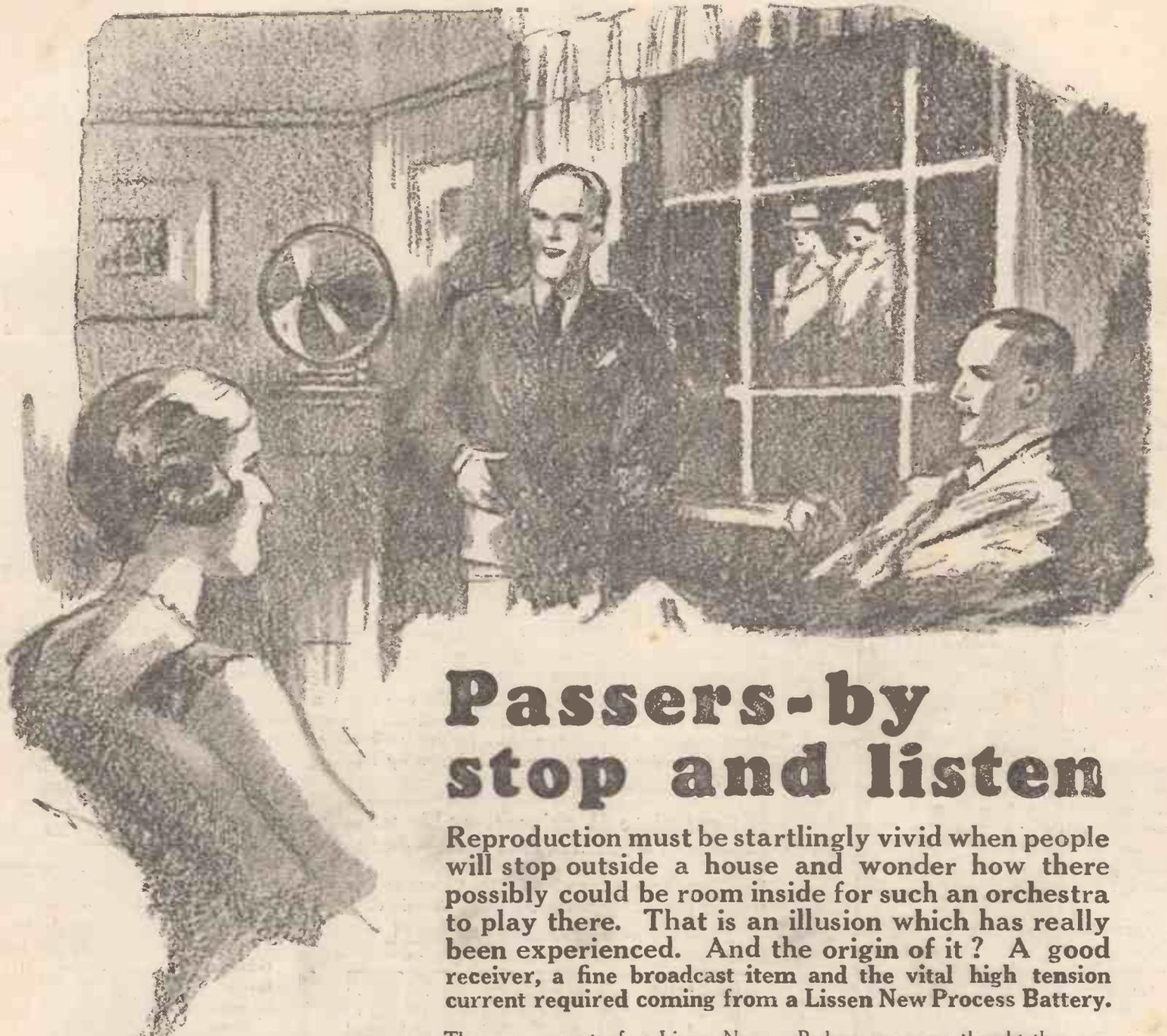
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WORLD-RADIO

Vol. XI No. 276

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FRIDAY, NOVEMBER 7, 1930

TWO PENCE

Empire Broadcasting

The Present Position

AT the Colonial Conference which was held in 1927 a recommendation was made that everything possible should be done to establish a broadcasting service in Great Britain. In response to this recommendation, the B.B.C., at its own expense and in co-operation with the Marconi Company, erected in 1927 an experimental short-wave transmitter at Chelmsford.

In our issue of April 25 last we published an article on the subject of "Empire Broadcasting," in which was outlined the history of this experimental station (G5SW) in its relation to broadcasting to the Dominions and Colonies—in other words, to "Empire Broadcasting." In the course of this article, the limitations of the present experimental station were emphasised and its complete unsuitability as a source of an Empire broadcasting service indicated. To say this, however, is, of course, not to admit—far from it—that G5SW has not done excellent work within the limits which it set itself on its establishment three years ago. Its usefulness as a channel of transmission of important national events has been proved again and again. Testimony to the enjoyment brought through its agency to subjects of the King the world over—particularly during last April and May, when (as an experiment with a special intention) the news bulletin was radiated every night except Sundays—has reached the B.B.C. in considerable volume.

It will be remembered that the experimental transmission of a nightly news bulletin during a limited period, to which reference has been made, was undertaken with a view to enabling the colonial Governors, who were soon to start for their Conference in London, to form an opinion of the value placed on this service by their own communities.

In addition, as a result of their experience, the B.B.C. submitted to the Postmaster-General, in November, 1929, an Empire broadcasting scheme for discussion at the Colonial Conference held in June last. The main points of this scheme were:—

- (1) The provision of a short-wave station capable of transmitting normally the same programme on two wavelengths simultaneously in order to reach all parts of the Empire in varying conditions of light and darkness.
- (2) The provision of a programme and news service suitable in point of time and content to all parts of the Empire.

During the two years since the opening of the experimental station, the B.B.C. has incurred a considerable amount of expense. It did not ask that it should be recouped for this outlay. It is worth noting, too, that the Postmaster-General agreed that the cost of an Empire service ought not to be met out of the revenue of the Corporation, and the Colonial Office, in March, 1930, emphasised this view. The B.B.C. was asked (1) to consider by how much the cost could be reduced if the programmes were restricted to those normally radiated by the home transmitters, gramophone records, and news bulletins, and (2) to ascertain the cost of a news service for broadcasting to the Empire.



A typical isolated Colonial bungalow where contact with home broadcasting would be appreciated

A revised scheme was submitted which applied to the Colonies, but not to the Dominions, the estimated cost of which is as follows:—

A.—Engineering Costs		ANNUAL.
Capital cost of twin transmitter £40,000, which sum borrowed at 6 per cent. interest, would show an annual instalment to cover amortisation in 5 years, plus 6 per cent. interest	...	£9,500
Annual cost of maintenance	...	7,000
B.—Programme Costs	...	5,500
		<hr/> £22,000

Under this scheme the B.B.C. offered to give free for five years the programme material of its

home service, subject to the repayment of contingent necessary expenses and to certain safeguards in respect to copyright and other obligations.

As a result of the experimental broadcast of news bulletins for a limited period, to which reference has been made above, the reports of the colonial Governors who assembled at the Conference in June indicate that public interest in the Colonies was considerable and increasing.

The revised scheme was considered by a committee of the Conference, and the following recommendations were agreed:—

- (1) That the Secretary of State be asked to approve the revised scheme.
- (2) That a part of the cost be borne by the Colonies to begin with, with the likelihood that they would eventually be able to defray almost the whole cost if the service were satisfactory.
- (3) That the cost be met by a levy of, say, five shillings on each colonial licence.
- (4) That local legislation be revised to give effect to these recommendations.

Moreover, the following resolution was passed by the Conference: "That the Conference recognises and appreciates the good-will of the British Broadcasting Corporation in this matter. They are in favour of the scheme for Empire broadcasting, and generally agree with the proposals outlined in the Committee's report."

It is obvious that the restricted programmes of the revised scheme, while acceptable to the Colonies, would not meet the needs of the Dominions, and in particular, those of Australasia and Canada, which would require their programmes respectively before noon and after midnight for their evening transmissions. In these circumstances, the Dominions could not be expected to contribute to the cost of the restricted scheme, nor, it is understood, were they prepared to agree on the basis of the more expensive proposal. The Corporation, therefore, submitted a further revised scheme, subject to the reservations already mentioned, under which the "colonial" version of the scheme would be amplified by adding special programmes chargeable to the Empire service which would be provided at other hours. This revised scheme still shows a very considerable saving on that originally proposed.

The Communications Committee of the

(Continued on page 710)

The Romance of Short Waves

By Professor E. V. APPLETON, F.R.S.

MUCH of the fascination of wireless may be attributed to the fact that the use of different wavelengths leads to very widely divergent results, and that the effects obtained on one wavelength cannot be used to predict what will happen when an entirely different wavelength is employed. That this is so is a modern discovery—and one that has surprised even the experts. We may be quite certain that the founders of the subject, Hertz, Lodge, and Marconi, never imagined that such a diversity of phenomena would result from the repetition of their experiments with greater power on different wavelengths, for the fundamental electrical theory on which the science was based certainly never hinted at the extraordinary difference which we now know exists between the behaviour of long and short waves.

Like most other histories, the history of wireless contains a period at which a revolution took place, and this revolution can be attributed entirely to the fact that the propagation of short waves takes place in a manner such as could not have been predicted from our long-wave experience. To appreciate the significance of this revolution we must consider the state of affairs which existed before the War. The foundation of long-distance wireless communication was laid in 1901, when Marconi first succeeded in sending signals across the Atlantic from Cornwall to Newfoundland. Medium waves were used on that occasion, but afterwards it was found that longer wavelengths gave better results. When it became necessary to prevent interference between the wireless stations of different countries by an international allocation of wavelengths, we can therefore understand why the representatives of the different nations simply clamoured for the assignment of the long wavelengths to their particular country. It would probably not be true to say that the short wavelengths were actually despised, but the attitude of the experts can certainly be described as one of indifference.

As research in wireless transmission became quantitative, it became possible to embody the results obtained on different wavelengths in an empirical law which was first enunciated by Dr. L. W. Austin, who was the pioneer worker in this subject. This law, which is a little too complicated to be expounded here, expressed in very definite terms the accepted superiority of long waves over short waves for long-distance transmission and, moreover, enabled the radio-engineer to calculate the best wavelength to use when communication was desired over any particular distance. It was only necessary to divide the distance by 500 to get the optimum wavelength, so that the law predicted that the most suitable wavelength for a distance of, say, 4,000 kilometres was the long wavelength of 8,000 metres.

The first hint that there might be something wrong with our complacent acceptance of the all-round superiority of long over short waves came at the end of, and just after, the War. Perhaps this may have been one more example of the tendency, which existed at that time, of examining afresh most things that had been regarded as settled. But such a re-examination was certainly facilitated in this case by the development of a new tool—namely, the thermionic valve—which made the production of wireless waves of all wavelengths, long and short, a relatively easy matter. During the War, using valve transmitters, some remarkable results were obtained with a wavelength of 60 metres, which is certainly a wavelength which had been regarded as unpromising. But the full force of the revolution was to come later.

After the War there was a great increase in amateur interest in wireless transmission, and the Postmaster-General allotted to amateurs who wished to communicate with one another some of the uninteresting wavelengths of 100 metres and less. The result was very startling, for it was found that a short-wave transmission on one of these wavelengths, although not heard very strongly locally, came in at great strength in another continent thousands of miles away! About the same time, the Marconi Company, as a result of the experiments of Mr. C. S. Franklin, had been independently led to the conclusion that there were extraordinary possibilities in the use of the much-neglected short waves, particularly when communication was desired over long distances. It was found that, owing to the effect of the ionised layer in the upper atmosphere—"that unexpected bonus on the part of Providence," as Sir Oliver Lodge calls it—these short waves were copiously reflected, so that, while not strongly received at near-by stations, the signals came in at great strength at points thousands of miles from their source.

In a very short time the revolution gathered great force. Increasing attention was paid to short-wave transmission and to short-wave phenomena generally. New valves specially suitable for short-wave generators were designed and special short-wave aerials of all types were investigated. National representatives at international conferences began to clamour for short wavelength allocations in just the same way as they had previously clamoured for the long wavelengths. The much-neglected short waves had certainly come into their own.

Although at first the short waves were used only for Morse stations, they were, after a time, also used for radio-telephony, and now there are plenty of broadcasting stations for the listener who will take the trouble to set up a short-wave receiver. By listening to these broadcasting stations it is possible to meet first-hand some of the problems which have arisen since the revolution. For the short waves, although capable of giving us such extraordinary results, are continually reminding us of their own individual peculiarities. Although they have greater carrying power than the long waves, they exhibit much greater variability. They are more affected by the change from night to day and from season to season.

Recent research has now shown that this variability of short-wave transmission can be traced chiefly to solar control. If by sunshine we mean all the radiations which are emitted by the sun, then we can say that the behaviour of the short waves is powerfully affected by sunshine. This influence is not direct, but is due to the effect that sunshine has on the upper reaches of the atmosphere. For certain wavelengths it is the after-effect rather than the direct effect of the sunshine that gives the best results, so that the night-time signals are many times stronger than those experienced in the day. With the very short wavelengths of from 10 to 15 metres it is found that direct sunshine is most favourable to satisfactory long-distance transmission.

Another most interesting result of recent research is that short-wave transmission is often powerfully affected by spots on the sun. For example, the short-wave link between this country and Canada is often rendered unworkable when there is a pronounced group of sun-spots. But at the same time it is often found that the corresponding transmission to South Africa is not affected—another example of the unexpectedness which seems to be associated with short-wave phenomena generally.

To all listeners, and to readers of *World-Radio* in particular, the reception of short-wave broadcast telephony can be recommended as a most fascinating extension of their interests. Many listeners are inclined to view the subject as one only suitable for the expert, but this is certainly not the case. What is not generally understood is that it is not at all necessary to build an entirely new receiver. Fortunately, in the superheterodyne principle, we have a powerful method of reception, and if a listener possesses a good receiver suitable for the ordinary broadcast reception it is easy to use a short-wave adaptor with it. With such a receiver, which I favour myself, the short-wave signals are converted into signals of the wavelength suitable for the long-wave receiver. After listening to Zeesen and Rome, which he will find it difficult to miss, the listener will begin to search farther afield. If in doing so he sometimes finds that, say, at sunset, the signals gradually fall from loud speaker strength, through telephone strength, almost to inaudibility, he must not be despondent. He must thereby be encouraged to listen for that station at another time of the day, when he might be just as likely to experience the satisfaction of observing the sequence of events in the reverse order.

SHORT-WAVE THRILLS AND ADVENTURES

(Continued from page 711)

States by the Prince of Wales. It was indeed a thrilling experience.

And then there was the broadcast of the opening of the new Canadian Parliament House, which was simply magnificent. There were two announcers, one speaking in English and the other in French. Every word that either uttered was reproduced with crystal clearness from the loud speaker.

The old days were full of adventures, but the short waves are as fruitful in them nowadays as ever they were. Of late the sun-spots have exercised a baleful influence upon reception, and night after night has passed with hardly a single station recorded as good in the log. For this reason short-wave reception has been, during the bad period, an even more exciting business than it was when conditions were good. A thrilling period of this kind occurred last Christmas, when wonderful reception was recorded. Since then there have been just a few marvellous nights when the set seemed to have all of its old powers. Conditions are now steadily growing better, and one needs to be no prophet to foretell that within a short time the short waves will be as good as they were five years ago.

EMPIRE BROADCASTING

(Continued from page 709)

Imperial Conference have discussed cable and radio services, and in this connection are prepared to draft a report on the question of broadcasting. They accepted the view that it would be possible for most of the Dominions to receive the British afternoon programme in the evening or late at night. The proposal was made that a programme divided into four sections should be transmitted—namely, a programme for India and the Colonies in the afternoon, one for Australasia, another for Canada, and an African programme.

It is not at all certain what the decision of the Imperial Conference now sitting will be.

It remains only to say that the B.B.C. attaches the greatest importance to the provision of an Empire broadcasting service and is ready to do everything possible to further the scheme, provided only it is reimbursed the additional cost thereby incurred.

Short-Wave Thrills and Adventures

IT seems hard to realise that it is seven whole years since long-distance reception on the short waves became an established fact. Just about this time in 1923, the well-known French amateur, M. Leon Deloy, whose call-sign is F8AB, succeeded in maintaining two-way working on a short wavelength with an American amateur whose call-sign was 1MO. The earliest triumphant entry in my short-wave log records one of the greatest thrills that ever came my way: the reception of 1MO's signals, which came through faintly but quite distinctly. From that time onwards, short-wave work went ahead like the proverbial house on fire, and it was not long before it showed signs of becoming a very popular hobby.

There was not very much to hear in those early days except the morse signals of enthusiastic amateurs. And, often enough, the thrill which came when telephony was unexpectedly tuned in, led to disappointment. Searching round between 50 and 100 metres, a carrier wave would be found. One soon learnt to distinguish telephony carriers from those of morse stations, and this one was very obviously of the right sort. Careful tuning brought in strains of music. Wonderful moment!

Minute after breathless minute one listened—and then came the call-sign, causing the collapse of the enthusiast like a pricked bladder. This wonderful signal was nothing more or less than a harmonic from some medium-wave broadcasting station.

Tuning itself was an adventure in the old days of short-waving, when the only circuit in general use was the straightforward type of detector, plus note-magnifier, with three coils, aerial, grid, and reaction, of the plug-in variety, fitted to a triple holder. The middle one was fixed, and this was the grid coil. The coupling of both the aerial and reaction coils could be varied, for they could be swung in the holder. This, in fact, was the only way of controlling reaction, since the Reinartz and other circuits with capacity-controlled reaction were not yet in use. We knew nothing about decoupling, and every part of this set, including the batteries and the telephone leads, was just about as "alive" as it could be.

It was quite usual, then, to have extension handles a foot or more in length to the tuning condensers and to the operating rods of the coil-holder. But even these were of little avail at times. Any signal that had been tuned in was almost certain to disappear as soon as the hands were removed from the knobs, and it was quite usual for real enthusiasts to do their fine tuning by moving their heads nearer to or farther away from the set.

One of the greatest thrills that I have ever had in the course of my short-wave career occurred in those early days. The set of coils in use had a range of from about 80 to 150 metres. Little or nothing was heard over the first half of the condenser dials as I moved slowly upwards over the wave-band covered. Then suddenly I came upon a strong carrier which was easily resolved. Music was coming through at really fine strength. "One of those wretched harmonics," I thought, and very nearly passed on. Luckily, I didn't, for when the musical item came to an end, I was electrified by hearing the unmistakable accent of America. "This," said a voice, small but beautifully clear, "this is KDKA, the station of the Westinghouse Company at East Pittsburgh." The announcer went on to say that tests were in progress. This must have been one of KDKA's first short-wave transmissions. Not long afterwards, the short-wave station came into regular use, and soon KDKA became nearly as easy to receive with the short-wave set as was the local station with the normal "broadcast" receiver.

A very great short-wave occasion was one that occurred some little time later. An American friend, who is a musician by profession, wrote to me that he would be playing on a certain date in the studio of WLW, the big station at Cincinnati. He wondered if I could possibly hear him through WLW's short-wave relay transmitter, which had recently come "on the air." I had tried several times for WLW, but had never succeeded in obtaining anything better than very faint reception. However, I overhauled the set and the aerial, and made certain improvements in the note-magnifying arrangements. The alterations were actually not completed until an hour or so before the time when my friend's broadcast from WLW was due.

Feverishly I connected up the set and made the usual preliminary tests. Everything apparently was as it should be. A search round showed that 2XAD and 2XAF were coming in extraordinarily well, and, hoping against hope, I went up to the region of 50 metres, which was WLW's wavelength. There was a carrier. There was music. A wait. There was speech. For the first time I heard WLW's call-sign clear and unmistakable. Would the luck hold? It did! Signal strength, in fact, improved as the minutes went by. By the time that my friend was due to appear it had worked up to loud speaker volume, and his item came through with marvellous quality. Curiously enough, within ten minutes of the end of his appearance, severe fading had set in, and before very long WLW had descended from the loud speaker to the telephones, and then from respectable telephone strength to bare audibility.

Another adventure that I shall never forget took place during the following summer. A friend and I had some work to do in London that kept us until late. We drove back in his car, reaching my house a little after midnight. Greatly daring, I asked if he would care to hear some broadcast music as we consumed the sandwiches that had been left out for us. "But there's nothing on," he said, "at this time of night." I said that I thought I might find something. Without saying what I was doing, I switched on my short-wave set and tuned in 2XAF. It was one of those nights when the short waves were coming through to perfection, with no fading and not a single atmospheric crackle. An operatic relay was in progress, and for more than half an hour we sat listening to its reproduction from the loud speaker.

"That's a wonderful broadcast," said my friend. "I do wish you would tell me where it is coming from." I replied that he would hear presently. And, sure enough, he did, when the voice of WGY's announcer spoke to us. I have never seen a man quite so surprised as was this particular friend when the loud speaker delivered its message.

From that time onwards short-wave reception was full of thrills and adventures, since new stations in distant parts of the world were continually coming into operation. One afternoon, after I had been listening to the amateurs in the neighbourhood of 45 metres, I put on a smaller set of coils to see if there was anything doing down below. Most emphatically there was, for I picked up for the first time Radio Malabar, the first Dutch station in Bandoeng. PLE and PLF are his present-day descendants.

Another thrill never to be forgotten was furnished by my first direct reception of Australian telephony when, one Sunday evening, I first heard Melbourne calling. Many old hands at the short waves must have heard the wonderful relay from Ottawa of the opening of the great frontier bridge between Canada and the United

(Continued in column 3, page 710)

U.S.A. "Short-Wavers"

By "VERNIER"

FEW short-wave enthusiasts, I believe, are certain of the exact location of the American stations to which they listen, the studios from which these stations take their programmes, and the exact times when they are "on the air."

The American transmitter most often heard by British listeners is, undoubtedly, W2XAD, and it is from this powerful transmitter that the B.B.C. usually take the broadcasts which are relayed from America, and have been quite a feature in the British programmes.

This station, which operates on a wavelength of 19.56 metres, and its twin W2XAF, on 31.48 metres, are situated at Schenectady, some seventy miles from New York City. Both relay, at intervals, the programmes of WGY, the 50 kW station of the General Electric Co., which takes a number of its programmes from WEA, operated by the National Broadcasting Co. A new schedule for the Schenectady short-wave transmitters has recently come into force, and is shown in the *World-Radio* list of short-wave stations.

The point was raised in this journal recently as to whether W2XAD broadcasts with more power in the aerial on some evenings than on others. Unfortunately, I was unable to visit Schenectady during my brief stay in New York, but I questioned the engineering department of the National Broadcasting Company on this point. They informed me that, as far as they knew, this station transmits regularly with a power of 20 kW in the aerial.

W8XK, which, by the way, I believe, is the oldest short-wave transmitter in America, is situated at Pittsburgh, Pennsylvania. This station, when not relaying the programmes of KDKA, its parent station, relays those of WJZ, operated by the National Broadcasting Company. W8XK now transmits on a number of wavelengths; but mostly on 25.25 metres, and it is on this wavelength that he is most often heard in Great Britain.

W3XAL is a fairly recent addition to the ever-growing list of American short-wave stations published in *World-Radio*. This station, which is operated by the Radio Corporation of America, is situated at Boundbrook, New Jersey, on the same site as the transmitter of station WJZ, the programmes of which station it relays. The short-wave station usually transmits on a wavelength of 49.18 metres from 4-6 a.m. G.M.T., and at this time can nearly always be picked up at good strength in Great Britain on a two-valve receiver. Occasionally he is to be heard on a wavelength of 25.6 metres, and he also experiments on wavelengths of 13.95, 16.87, 19.83, and 31.35 metres.

W9XF, the short-wave transmitter of the Great Lakes Broadcasting Co., in Chicago, operates on a wavelength of 49.83 metres, and is often to be heard at good strength in Great Britain during the early hours of Monday morning. This transmitter relays the programmes of WENR, the 50 kW Chicago transmitter.

W2XE, the short-wave transmitter, owned and operated by the Columbia Broadcasting Co., is situated at Rockaway, Long Island, about thirty miles out of New York, and relays the programmes of WABC, the key station of the Columbia network. W2XE operates on a wavelength of 49.02 metres, with a power of 300 watts in the aerial, and is continually "on the air" from 1 p.m. to 5 a.m. the following morning.

W8XAL, situated at Cincinnati, Ohio, transmits on a wavelength of 49.5 metres and relays the programmes of station WLW. Judging

by the strong signals that I pick up from this transmitter in New York, he should be well received in Britain on good nights.

Many listeners have told me that they find difficulty in establishing the identity of American short-wave stations, particularly those on the 49-metre band. All American broadcasting stations are compelled to announce their call signs every fifteen minutes, except during dramatic programmes, by ruling of the Federal Radio Commission. Even when perhaps forty stations are relaying a programme from the New York studio, on what is known as a National hook-up, each will break off and announce his call sign at the fifteen-minute mark. Listeners in Great Britain, therefore, should find no difficulty in identifying American short-wave stations, providing they are prepared to wait up to fifteen minutes for an announcement, and that their reception is not marred by fading.

Television in America is making progress, and at the moment all transmissions are carried out on wavelengths below the broadcast band. The wavelengths allotted by the Federal Radio Commission to television transmitters are 150-143 metres, 109-105 metres, 143-136 metres, 105-102 metres, 49.34, 25.34, and 16.87 metres. No doubt transmissions on some of these wave-bands will, by now, have been picked up in Britain.

During my brief visit to the research department of the National Broadcasting Company in New York, I was very interested in a new method of photographic transmission on the principle of the Fultograph system. By this system, printed matter can be converted into electrical energy, transmitted from a short-wave experimental transmitter, and picked up at the research department of the NBC on Fifth Avenue. Here the incoming signals are re-converted, and the printed matter is reproduced on paper. I am told that it is possible, by this means, to transmit advertisements in three different colours, ensuring perfect reception at the receiving end. Surely the day cannot be far off when we shall wake up in the morning, move a switch, and let the morning paper print while we sing in our baths!

BROADCASTING IN AUSTRALIA

(Continued from column 2)

announcements, and the National Anthem is always "programmed" at the end of the day.

Finally, the Sunday programmes (again quoting the Sydney, 2FC, programme, as an example). Australia begins listening on a Sunday at 10.0 a.m., when the "Church Hour" starts. This actually lasts for an hour and a half, and includes news, sporting news, music from the studio, and a morning service O.B.

At 3.0 p.m. the Afternoon Concert begins, and continues until 4.30. This is made up of a musical programme and a talk.

Then, at six o'clock, follows the "Evening Presentation," which goes on until the station closes down at 10.30. The period consists of forty minutes of music, and a twenty-minute talk. These times and items are repeated, and at 8.0 p.m. the main evening concert begins: a weather report, an address, the second half of the concert and "Meditation Music."

There are approximately thirty-two stations—either built or projected in the Commonwealth, all within a waveband of 580-1,500 kilocycles, and in the words of an Australian listener, "we get fairly good services."

W. M. G.

(Continued from Col. 3)

Tuesday, the Eleventh Day of November, 1930. You will be listening for the sonorous chimes of Big Ben, as they come through on your loud speakers or ear-phones. Your thoughts will naturally fly to the loved ones who are gone. Think, too, I beg you, of the living who are in your midst.

Broadcasting in Australia

(Continued)

The "B Class" Stations

IN addition to the "A Class" stations, which receive a share of listeners' licences, there are a number of "B Class" stations, which raise revenue in their own way and render a more or less useful service. Some of these have a very good following, and their strength lies in the fact that they can specialise to please any particular section of the public without any other section being entitled to complain. Thus 2UW Sydney is devoted almost entirely to the broadcasting of high-class records; 2KY belongs to the Trades Hall, and is used for propaganda; 2UE devotes regular hours to doctrinal talks under the auspices of the Roman Catholic Church; 2GB broadcasts the services of the Theosophical Society which controls it. The Protestant Churches in Sydney have been promised a licence to establish a "B Class" station, which may be brought into being very shortly. Being able to raise revenue from advertising, the "B Class" station 2UW gave a ball-by-ball description of the Test cricket matches. After every over a cable or beam message was despatched from the ground, and from this the announcer built the story of the play. Thousands of listeners sat up till 4 a.m. to hear details until "stumps drawn," and between the overs they endured a dissertation of the merits of a particular brand of beer, paint, hats, cricket bats, furniture and a few other articles, the proprietors of which paid the cost of the cables.

Australia's Comparative Position

The number of licensed listeners in Australia has increased steadily. In July, 1924, there were 1,206 in the Commonwealth. Then Toti dal Monte sang, and in five months the number went up to 38,336. At the end of 1925 there were 85,130 licences; 1926, 187,228; 1927, 258,179; 1928, 288,874; 1929, 302,539. Since that time the increase has been relatively slow, the total number at the end of May, 1930, being 311,322, or 4.81 per cent. of population. The latest figures, to July of this year, are 323,000. Australia is thus sixth in comparison with the European countries. The State of Victoria, however, has 141,081 licences, or 7.93 per cent.

What Australia Hears

The whole day's programme is divided into six sessions, thus: 7.0-8.15 a.m., Early Session; 10.30 a.m.-12.30 p.m., Morning Session; "The Lunch Hour" from 1.0 to 2.0 p.m.; "The Radio Matinée" from 2.30-4.0 p.m.; then the Early Evening Session between 5.45 and 7.55, until at 8.0 p.m., the Evening Programme begins, continuing until the station closes down at 11.0 p.m.

The following *précis* of a day's programme is fairly typical of what the Australian listener is offered. Out of a total programme time of twelve and a half hours, seven and a quarter hours are devoted to music, varying in type from Haydn string quartets to dance music. In connection with the latter, it is interesting to note that during the particular day's programme from which these facts are drawn, only thirty-five minutes' dance music was broadcast.

Talks accounted for forty-three minutes—three being broadcast. These dealt with racing, current topics, and a description of the Catacombs of Rome, and in length varied between thirteen and fifteen minutes.

Other items during the day included a morning story, morning devotion, and "Household Helps" Stock Exchange Quotations were broadcast four times, and Weather Forecasts twice.

All the items are timed in detail—even the

(Continued in column 1)

Armistice Day, 1930

By J. D. STRANGE

"Yodeller" and Author of "The Price of Victory"

ON Tuesday comes another Armistice Day, a Day of Remembrance. Some of you will attend your local Service of Remembrance; some will prefer to remain at home, to think in the seclusion of the family circle of those who, in the awful 1914-1918 years went from amongst us. Few there will be who, having wireless sets, will not listen to one or another of the broadcast services on this Eleventh of November. The thoughts of England, and of the world, will be with that great army who laid down their lives for their country.

This is as it should be. But there are others. When your heart stands still in that wonderful, awe-inspiring Silence at the Eleventh Hour, think, I beg of you, of yet another army—the Army of the Disabled.

I have written many articles for this journal in past years. This I write from my heart. Think of the men who, although they did not give their all, yet gave the best part of them to their country's need—their health. Amongst you is a huge army of crippled men—men whose nerves were ruined by the ghastly strain and hardship of the trenches; men whose limbs were shattered by bullets and shrapnel, and men whose lungs were affected by gas and exposure.

Some of these have small pensions—pitifully small—and some have no pension. Some are walking the street—when they should be in bed—looking for work to keep themselves and their families, yet, because of the very nature of their illness and disabilities, unable to enter a trade or employment. Some are too ill even to seek work, and their meagre pension will hardly buy them bare necessities.

Few people know the hardships endured by the disabled ex-service man since the War. Many men, married after the War, have subsequently developed tuberculosis as a result of their service, yet can claim only a single man's pension. Think of a man, sick, needing nourishing food, and compelled to keep his wife and family on £2 per week. He can claim no more, and is eligible neither for the dole nor for out-relief. Nobody knows the hardships endured by the disabled Tommy. And—I fear—a great number of people—do—not—care!

So, on this Eleventh Day of the Eleventh Month of 1930, spare a thought for the living. Buy your Flanders poppy, give to any charitable funds you can, but, above all, give a charitable thought, and a helping hand, to any disabled ex-Tommy whom you may meet or know.

They don't want charity, most of them. Try and find them a job, if it's only a part-time occupation. And if you are at the moment employing one disabled man, try and make a job for a second. Perhaps the man you are employing isn't giving you entire satisfaction. Perhaps he can't, because of his disability. Be sympathetic and give him a chance.

Hundreds of doctors are daily examining ex-Tommies, and reviewing their pensions. I would ask of these medical men to think of their responsibilities when this Armistice Day comes. Let them temper their judgment with a measure of Christian kindness, and bring into the drab coldness of the Medical Board-room a little of the spirit of Remembrance.

The War has been over a long time. Do not, because of that, forget the men who have suffered through it. The longer the time that has elapsed since the War, the longer have these men endured their disabilities.

All over the world Englishmen will be thinking one thought at Eleven O'clock on

(Continued at foot of Col. 1)

Via Ether

Short Waves

THE occasion of a special Short-Wave Number of *World-Radio* serves to draw particular attention to this useful form of broadcasting. Such terms as "romance," "fascination," and "thrills" applied to short-wave reception, although they are far from being original, have, nevertheless, not become hackneyed, and in my opinion their use is amply justified. Who, for instance, having read Professor Appleton's series of articles on this subject, which appeared, not long ago, in the columns of this journal, could deny the existence of real romance in connection with its pursuit? Or who, again, reading of another's early experiences of reception on the high frequencies, or remembering his own, could fail to find a very genuine thrill? The very possibilities which the future holds is the subject of a romance in themselves. At present broadcasting is carried out on as short a wavelength as some fifteen or sixteen metres. Shall we some day listen to transmissions on double this frequency, or even higher?—over strictly limited distances, of course, since in these regions we forfeit the reflexive assistance of the Heaviside Layer. There is no doubt that in the sphere of broadcasting—which is only one of the many uses of the short wave—the potentialities of the higher frequencies are yet only dimly guessed at. It appears to me that more and more listeners would find their efforts well repaid in turning their attention to short-wave reception, since they can be sure of interesting results at some time or other during the day, no matter whether that day be a long or short one. Short-wave broadcasting transmitters are growing in number and show a tendency to grow also in power. Thus the field for listeners is an ever-widening one.

Simplifying Short-Wave Reception

WHEN discussing with friends, of considerably greater wireless experience than myself, the question of short-wave reception, I have gathered that one of its chief disadvantages is the necessity of having a completely separate equipment; another is that the "change-over" of aerial, loud speaker, and batteries involves a little trouble and, not infrequently, means that the regular broadcast receiver is put, and left, out of commission as far as the other members of the household are concerned. At times the latter have been heard to express quite strong opinions on the matter. It seems to me, however, that the type of short-wave adaptor which, so I am given to understand, is described on another page, and which may be used quite readily with an existing receiver, overcomes the difficulties in question. To revert to ordinary broadcast reception, when the set has been left connected for short-wave work, involves merely the transfer of the aerial plug. I therefore commend the article in question to the careful attention of all interested in short-wave reception.

Continental Concerts

NEXT week's orchestral and operatic broadcasts include many interesting items. The

concert to be given by the Leipzig Symphony Orchestra at 11 a.m. on SUNDAY, November 9, will be broadcast from that station and relayed by Berlin and Königs Wusterhausen. The programme consists of dances taken from symphonies. At 3.10 the same afternoon a programme of chamber music will be transmitted from Hilversum. It will be rendered by the famous Czerniavsky Trio, with whom I shall be pleased to renew acquaintance. Finally, at 8 p.m., from Munich and its associated stations we are to hear a Siegfried Wagner concert. On MONDAY the lovers of orchestral music should make Vienna their goal. At 8 p.m. the Vienna Symphony Orchestra will give a concert, the main item of which is Beethoven's Third Symphony ("Eroica"). The concert will be preceded at 7 p.m. by a violin recital by Mr. Albert Spalding, whose picture appeared in these notes a week or two ago. A programme of chamber music is to be broadcast at 8.45 p.m. by Radio-Paris, and the same station's Armistice Day broadcasts on TUESDAY will culminate with the transmission at 9.30 of Beethoven's *Eroica* Symphony.

Opera

TURNING to Opera, I must first of all mention Frankfurt's transmission of Bizet's *The Pearl Fishers* at 1.55 p.m. on SUNDAY. At 7 p.m. on the same day Berlin, Hamburg, and Langenberg will each transmit an operatic work—viz., Borodin's *Prince Igor*, Beethoven's *Fidelio*, and Mozart's *Il Re Pastore* (The Shepherd King). My choice will probably fall on the first named. The performance is being relayed from the Berlin State Opera House, and it is also being taken by Königs Wusterhausen and Leipzig. At 6.35 p.m. on MONDAY Richard Strauss's *Salome* is to be broadcast from Munich, and Puccini's *Turandot* will be heard from Milan and Turin at 8 p.m. on TUESDAY. WEDNESDAY's operatic transmissions are well timed to enable me to listen to them both. At 6 p.m. Vienna will render Bittner's *Die rote Gred*, whereas at 8.5 p.m. Rome will broadcast Meyerbeer's *L'Africaine*. By the way, Herr Julius Bittner, the composer of the former, holds the office of a judge at Vienna. He has written a number of melodious works, and his subjects are usually taken from the lives of the people.

Copenhagen's Concert

SEVERAL symphony concerts figure in the programmes of WEDNESDAY. Thus at 7 p.m. we are to hear one from Algiers, and at 8 p.m. another from Berlin and Königs Wusterhausen, when the well-known conductor, Herr Herrmann Scherchen, will lead the orchestra, and Richard Strauss's *Till Eulenspiegel's Merry Pranks* is among the works to be rendered. At 8 p.m. on THURSDAY a symphony concert and a programme of chamber music will be broadcast from Langenberg and Munich respectively. FRIDAY's most notable concert is the transmission from Copenhagen. The orchestra on this occasion will be conducted by Herr Josef Krips, of Karlsruhe, and the soloist will be Anni Frind, of the Dresden Opera House.

The programme consists entirely of Austrian music and includes Mozart's Symphony No. 39 and compositions by Johann and Joseph Strauss. Herr Krips, who is of Austrian birth, gained great popularity on his previous visit to Copenhagen by his charming interpretation of Austrian music. The week's concert broadcasts will be concluded on SATURDAY by a Wagner concert to be transmitted at 6.30 p.m. from Frankfurt and relayed by Königs Wusterhausen and most German stations. The soloist on this occasion is Herr Leo Slezak, a great Wagnerian tenor.

An Encouraging Report

ONE is apt to think of a report as of necessity a rather dull thing, but dull is the last word to apply to an annual report which has just come into my hands—that of the National Institute for the Blind. It is a revelation of what can be done by intelligent sympathy and patient organisation. To attempt to deal individually with the many-sided activities of the National Institute in its endeavours toward the alleviation of the lot of those afflicted by sightlessness, and its remarkable achievements in finding a practical mitigation of their handicaps, would require not only far more space than I have at my disposal but a knowledge of many crafts and professions, varying from sculpture to the working of a specially contrived knitting machine. For massage work, of course, the blind are peculiarly suited by reason of their acute sense of touch, but when one sees a beautiful model of the *Shamrock V* made by a blind man, and reads of blind students "walking" hospitals, and picks out from a long list of home industries (which are carried on under the Institute's scheme), such items as weaving, wood-chopping, carpentry, and boot repairing, one feels that blindness has indeed been conquered by courage and perseverance, informed by sympathy.

Broadcasting and the Blind

OF especial interest to me, and of course to readers of this paper, is the section dealing with the "Wireless for the Blind" Fund. A committee composed of members of the Union of Counties Associations for the Blind, St. Dunstan's, the central authorities for the blind in Scotland and Northern Ireland, and the B.B.C. was formed last year with the aim of providing every blind person in the country with a wireless set. The appeal, launched on Christmas Day by the Rt. Hon. Winston Churchill, M.P., met with immediate response. By the end of the financial year (March 31, 1930) £15,500 in cash had been received, while members of the Wireless Trade combined to give 1,000 valve sets. One is stirred to learn of one sympathiser whose engagement present to his fiancée took the form of a gift of wireless receivers for all the blind in Gloucestershire and the permanent maintenance of the installations. I hear from the secretary that the result, to date, of the recent broadcast appeal and of the morning service at which also reference was made to this subject, is £5,600.

ETHERVIATOR

Dominion and Foreign Broadcasting Intelligence

AUSTRALIA

Wireless Picture Service
(From our Australian Correspondent)

The Melbourne broadcasting station 3DB, which is owned by the Melbourne *Herald* newspaper, inaugurated on September 15 the first wireless picture broadcasting service in Australasia. The service is now working regularly, and the pictures received are quite good, though the number of receivers so far in use is limited. The first picture radiated was a portrait of the King. Pictures illustrating news of the day gathered by the *Herald* and *Sun News-Pictorial* photographic staffs are being broadcast on three evenings a week after the conclusion of the regular musical programme at 11 p.m. It is intended shortly to extend the service to three picture broadcast sessions daily. In these sessions the latest pictures of the day's events, with "news flashes," will be sent out, and it is further proposed to radiate simultaneous pictures and speech, giving a verbal description of the news illustrated in pictures. The picture broadcasting equipment was supplied and is being operated by Television and Radio Laboratories Ltd., and the pictures are being received on Fultograph receivers. On Oct. 1 the Sydney station 2UE began a picture service in co-operation with the *Sun* newspaper. Reproductions of market reports, sporting results, and weather forecasts will be a feature.

CANADA

Studying Britain's Broadcast Drama

Wireless broadcasting in Canada is entering upon a new phase, and Mr. E. A. Weir, Director of Radio for the Canadian National Railways, has been visiting England in the belief that this country can furnish the Dominion with constructive ideas to further such development. The Canadian National Railways intend to produce this winter a series of wireless plays depicting dramatic episodes in Canadian history, as already announced in *World-Radio*. It is particularly in regard to this new departure that Mr. Weir has come to England to learn the methods employed by the B.B.C. in the presentation of this type of radio entertainment, which, he says, is far in advance of that on the other side of the Atlantic.

CEYLON

Receivable Short-Wave Stations
(From a Correspondent)

At the request of numbers of listeners the broadcasting authorities of Colombo are preparing an up-to-date list of short-wave broadcasting stations which may be heard in Ceylon and South India, and those desirous of receiving a copy of this list are invited to apply to the Colombo broadcasting station.

BELGIUM

New Broadcasting Organisation

The newly-formed Institut National Belge de Radio diffusion is the central executive authority for broadcasting in Belgium. M. van Soust de Borkenfeldt, the former Director of Radio Belgique, has been appointed Director-General of the new body.

FRANCE

(From our Paris Correspondent)
Components to be Taxed?

In addition to the proposed taxes of 5s. per crystal set and 11s. 3d. per valve set, it is now learned that the Budget proposals contain a provision to tax valves and spare parts. The listener, who had reconciled himself to the former

taxes, does not, however, reconcile himself to the idea of these additional taxes, and more opposition may be expected to them when the matter comes to be debated.

Radio Strasbourg-Brumath

Although this station does not open officially until the eleventh of this month, tests have been made for some time now, and reports coming in from all parts show that reception has been good throughout France, though there has been some fading and in certain districts some interference from Barcelona.

Radio Lyon

Relays from foreign stations will be made from Radio Lyon twice a month

Wireless Competition

Well-known wireless personalities are being interviewed at the microphone of the Paris P.T.T. station and listeners are invited to guess the name of the person interviewed, prizes being offered to the successful competitors. The first interview took place on October 31 and succeeding ones will take place at short intervals.

GERMANY

Langenberg's Power to be Increased
(From our Cologne Correspondent)

It has just been announced that the aerial power of the Langenberg transmitter will be increased from 17 kW. to 75 kW. in the course of next summer, and Western Germany will then be provided with a high-power station consistent with the number of its present and future listeners. It may be safely assumed that with this installation the number of local listeners will greatly increase in this thickly populated, though comparatively poor district, the more so since experience has shown that the cost of a sufficiently strong receiving set has invariably proved to be the obstacle to many people taking out licences.

HOLLAND

(From our Correspondent at The Hague)

U.S.A.-Netherlands Relay

Amsterdam is attempting to secure a record in long-distance transmissions on a large scale when, during the night of November 15-16, M. Hendrik van Loon, the Dutch-American historian and satirist, will make a ten minutes' speech which will be relayed over the whole of the United States. M. van Loon is to talk about the painter Rembrandt, a new biography of whom, under the title of the painter's full name, Rembrandt van Rijn, he has recently published.

The Broadcasting Censorship in Holland

Questions of broadcasting censorship are still causing no little agitation among the transmitting societies and their listening members. The recent action of the Radio Council in cutting off the connection in the middle of a lecture by a member of the V.A.R.A. on the ground that it had not been submitted in time for the censor to give his approval is to be made the subject of a test case before the Courts. The plaintiff in the case will be the V.A.R.A., and the defendants the State of Holland. A question has also been raised in the Chamber as to the abolition of the preventive censorship, but by a majority of nearly two to one its retention has been approved.

Meanwhile neither side seems ready to yield anything in the conflict, and the Radio Control Commission has informed the V.A.R.A. that in future the half-hour literary talks must also be submitted for censorship.

ITALY

(From our Turin Correspondent)

The Coming Season at La Scala, Milan

The opera season at La Scala, Milan, will open on December 7 with Verdi's *The Lombards*, to be followed on December 8 by Donizetti's *Don Pasquale*, on the 11th by Wagner's *Tristan and Isolde*, on the 17th by Boito's *Mephistopheles*, on the 18th by Verdi's *Rigoletto*, and on the 26th by Catalani's *Lorelei*. The season of new operas will be opened at the beginning of January with Pizzetti's *The Stranger*.

A Precious Musical Collection

Some time ago it was announced that Professor Louis Torri, of Turin, had discovered a veritable treasure of old and unknown music. The complete list of the collection is as follows:—

(1) Preludes and intermezzos by Alessandro Stradella.

(2) Seven operas by Antonio Vivaldi.

(3) Four volumes of religious and four volumes of instrumental music by the same composer.

(4) Eleven tone pictures by G. B. Wanhal, one of Bohemia's (Czechoslovakia) great composers.

(5) Eight volumes of organ music, including numerous works by Italian and foreign composers of the fifteenth and sixteenth centuries.

(6) First editions of Haydn and Mozart sonatas.

(7) Works by Traetta, Galluppi, and Joseph Scarlatti.

(8) An opera, *St. Eustachie*, by an anonymous composer based on a libretto by Cardinal Rospigliosi and attributed to Marazzoli. This opera was performed in Rome in 1643.

Altogether this is a most interesting collection, which has been left in the care of Maestro Alberto Gentili for study and publication.

Toscanini leaves for U.S.A.

Signor Toscanini has just departed for New York, in order to take up the conductorship of the season of Symphony Orchestra Concerts which are due to begin on November 13. He will this year also conduct concerts at Philadelphia for the first time. Signor Toscanini will return to Italy in April next.

The Trieste Station

The news that the new station at Trieste is nearly completed and about to begin to operate is incorrect. The work is being pushed forward with great energy, and, if the season will permit it, it should be completed in about two months' time. The building of a broadcasting house in the heart of the town is also being proceeded with as speedily as possible. Here will be installed the studios and administrative offices, as well as the control-room. The new station will have a power of 8.7 kW., and the authorities are at present exploring the possibility of linking it up with the Italian triangle of stations Milan-Turin-Genoa by means of a land line passing through Padua.

Proposed Regulations for Radio-Apparatus

The Minister for Communications, Signor Ciano, has presented a Bill to Parliament which contains new regulations for the installation and use of electro-radio apparatus. The proposed new law seeks to prevent the clandestine installation of amateur wireless stations and it is also an attempt to eliminate interferences which they cause to the transmissions of the regular broadcasting stations.

9d

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Foreign Languages

Aids to Listening

FRENCH

La Semaine Prochaine aux Postes Français

La semaine prochaine, semaine de l'Armistice, programmes excellents aux postes parisiens. Un seul opéra, "Mireille" de Gounod, une opérette d'Audran, une seule œuvre dramatique, "Les Flibustiers" de Jean Richepin voilà toutes les œuvres théâtrales de la semaine. Mais en revanche la musique classique d'orchestre est abondamment servie. A tour de rôle l'Ecole Supérieure et Radio-Paris nous offrent des concerts aussi variés qu'intéressants.

Dimanche, 9 Novembre, dans son concert de musique religieuse enregistrée à 12 h.30 Radio-Paris nous fera entendre "La Passion selon Saint Jean" de J. S. Bach, œuvre grandiose et complexe, d'une rare éloquence et d'une profonde richesse. L'"Agnus Dei" de Bizet nous montrera une partition peu connue et assez inattendue de la part du créateur de "Carmen" et de "l'Arlésienne." A 16 h.30 la station de l'Ecole Supérieure diffusera le concert symphonique Pásdeloup dont l'orchestre sous la direction de M. René Baton interprétera pour le Festival Wagner l'ouverture du "Tannhäuser" et la "Chevauchée des Walkyries." Mme. Balguerie et M. Franz se feront entendre dans le duo du prologue et voyage au Rhin du "Crépuscule des Dieux." Aux P.T.T. M. Buisson dirigera à 20 h.45 un excellent orchestre qui jouera du Massenet, du Berlioz, et du Mozart.

Lundi, programme remarquable à Radio-Paris. Le célèbre Quatuor Roth jouera en soirée le Quatuor en La-Mineur de Schumann et un Quatuor de Ravel, musique raffinée et enthousiaste.

Dans la journée deux concerts de disques admirablement sélectionnés.

Le mardi, jour de l'Armistice, nous réserve deux événements. L'un, technique autant qu'artistique, l'inauguration à 18 h. du nouvel poste de Strasbourg avec exécution remarquablement soignée du grand Requiem de Mozart, sera relayée par tous les postes d'Etat. L'autre, artistique celui-ci, la présentation à Radio-Paris de plusieurs scènes de la pièce célèbre de M. Paul Raynal, "Le Tombeau sous l'Arc de Triomphe," qui connut un si grand et si légitime succès sur les scènes du monde entier. Ensuite, pour terminer cette soirée, l'"Héroïque" de Beethoven. A 10 h. du matin les stations des P.T.T. diffuseront le "Requiem" de Berlioz, écrit en plein apogée du Romantisme et dont la partition est d'une rare inspiration mélodique et d'une ingéniosité musicale hors pair.

Mercredi, pendant un concert de la Radio aux Aveugles donné à l'Ecole Supérieure à 15 h., "La Paix chez Soi," mordante comédie de Courteline et le soir un de ces Galas des vieux succès français, qui sont toujours suivis des auditeurs avec une attention particulière. A Radio-Paris à 15 h.45 quatre "Concertos" de Bach, Mozart, Schumann, Liszt (disques), et le soir le "Concerto pour violon et orchestre" de Tchaikovsky et la "Troisième Symphonie" de Brahms.

Jeudi, Radio-Paris présentera dans la série de ses courtes évocations historiques "La Vie dans les Cafés Littéraires," ces centres intellectuels de Paris, où artistes et auteurs se réunissent, discutent et travaillent, où se forment les grands courants littéraires et artistiques, où la vie est intense et l'art tout-puissant. Le concert qui suivra comprendra autres trois pièces pour piano d'Albeniz, délicieuses fantaisies empruntées à la musique populaire espagnole. Les P.T.T. donnent en soirée l'œuvre magistrale de Jean Richepin "Les Flibustiers," drame simple et fin, splendidement construit, drame de la mer, tout empreint de cette inspiration harmonieuse, de cette éloquence passionnée que le vent du large dicta plus d'une fois au généreux poète.

Le vendredi apporte sur l'onde des P.T.T. pendant le concert de midi deux Danses Slaves de Dvorák qui, plus encore que Smetana, est le grand musicien tchèque et dont la musique a une couleur de style, une richesse d'harmonies parfaitement ravissantes. En soirée cette station donne une opérette d'Audran, "Gilette de Nardonne," avec le concours de toute une troupe d'artistes de la Gaîté Lyrique. A Radio-Paris règne l'opéra. Sous la direction de M. Defosse est représentée "Mireille" de Gounod, qui vers le milieu du siècle dernier détermina un renouveau de l'art musical en France et créa "l'opéra de demi-caractère," genre nouveau, moins dramatique, plus familier et moins sévère, souvent léger et parfois comique. "Faust" excepté, "Mireille" est celle de ses œuvres qui est la plus fréquemment jouée et qui est une parfaite illustration de son génie.

En fin de semaine, le samedi 15 Novembre, un programme aussi varié que beau. Surtout à Radio-Paris qui commence la journée par une diffusion du concert du Conservatoire de Paris, dont les concerts bien que moins courus que les grandes manifestations de Colonne ou de Pásdeloup, ne s'en tiennent pas moins sur un niveau artistique d'une rare qualité. A 17 h. diffusion du Concert Colonne donné au Théâtre du Châtelet. Au programme "Saint François d'Assise," œuvre magistrale de Gabriel Pierné sous la direction de l'auteur et avec le concours de deux chœurs bruxellois et de membres du Conservatoire Royal de Bruxelles comme solistes. Près de 600 exécutants assureront à cette œuvre grandiose une interprétation sans précédent. Le soir au studio de Radio-Paris soirée consacrée à Jacques Offenbach précédée d'une conférence de l'éminent critique musical

L. Schneider. A l'Ecole Supérieure, ce jour là, comme tous les samedis, diffusion du concert Pásdeloup et au concert de l'Œuvre de la T.S.F. à l'Hôpital à 15 h. exécution au piano d'une Sonate de Mozart et du charmant "Reveil Matin" de Couperin, claveciniste de la chambre et organiste de la chapelle du Roi Soleil. B. G.

SPANISH

Una consulta sobre gramática

UNO de mis lectores escoceses me hace dos preguntas muy interesantes:—
(a) ¿Cómo se traduce *than that* al español en frases como la siguiente: "I would rather my son died *than that* he should betray his country"?

(b) ¿Qué interpretación se ha de dar a la frase: "El dependiente dijo que la caja *debía haber* llegado ya."? ¿Es que la caja *must have* or *ought to have* arrived?

Contesto en el mismo orden:—

(a) "Antes (o más bien) quisiera que muriese mi hijo *que no que* traicionara a su país." Nótese la introducción de *no* entre *que* (*than*) y *que* (*that*).

(b) Al trasladar (*change*) a tiempo pasado lo dicho (*what was said*) por el dependiente, resulta cierta ambigüedad. Pero ésta desaparece si se observa siempre la regla de *que deber* va seguido de (*is followed by*) la preposición *de* cuando significa probabilidad o suposición, y que sin *de* connota (implica—*implies*) obligación que no admite duda. Fijense bien mis lectores en los ejemplos siguientes:—

"Dijo que debía de haber llegado." (it *must have* arrived).

"Dijo que debía haber llegado." (it *ought to have* arrived).

"Cuando halló la carta, él debió de leerla" (he *must have* read it).

"Cuando halló la carta, él debió leerla" (he *ought to have* read it).

La radiodifusión en España

Hace pocos meses se celebró el quinto aniversario de la emisora EAJ7 de Madrid, con la cual Unión Radio, S.A. (Sociedad Anónima) inauguró sus servicios en España el día 17 de Junio de 1925. A los de mis lectores que acostumbren escuchar las emisiones de dicha estación y de la no menos importante EAJR de Barcelona, les ha de interesar saber algo de la historia de Unión Radio.

Si bien (aunque) no se estableció esta sociedad hasta, 1925, no se debe creer que en España no había aficionados a la radio (telefonía) antes de aquella fecha, pues de que los había, y muchos, tuve yo ocasión de enterarme en los años 1923 y 1924, cuando a raíz de (a base de) mis "charlas españolas" que en aquel entonces (*at that time*) se radiaban de Manchester, recibía casi a diario (diariamente) cartas de entusiastas radioyentes españoles que, con los complicados y costosos aparatos de aquellos días, escuchaban extasiados los programas de las ya numerosas estaciones británicas. Era muy grande el interés y entusiasmo con que se entregaban a la nueva ciencia. Porque el español culto es así, de temperamento impulsivo e imaginativo, y siempre dispuesto a dedicarse con energía al estudio de toda novedad en el mundo científico. Muchas, pues, fueron las solicitudes (peticiones) dirigidas al Gobierno por los que aspiraban a establecer estaciones emisoras, y por fin, el Gobierno se vió obligado a dar algún paso (*take some step*) en el sentido de reconocer oficialmente esta nueva actividad. Se convocó una reunión de personas interesadas en la radio: aficionados (*amateurs*), peritos (*experts*) y comerciantes, y las grandes empresas de electricidad quisieron establecer una especie de B.B.C. española. Pero el Gobierno se decidió a dar largas (*put off, delay*) al asunto,

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e hizo un arreglo provisional que redujo la radiodifusión en España a un estado caótico. A todo el que (*everyone who*) lo pedía se le concedía permiso para establecer una estación emisora, con tal que ésta satisficiera un mínimum de condiciones técnicas muy fáciles de llenar. En muy poco tiempo el Gobierno hizo nada menos que 26 concesiones de emisoras, pero ninguno de los concesionarios disponía de medios (*means*) suficientes para desarrollar (*develop*) un sistema de radiodifusión continuo y eficaz, ni tampoco, al solicitar las concesiones, habían tenido la menor intención de hacerlo.

Había, pues, un inminente peligro (*danger*) de que, pasada la primera gran oleada (*wave*) de entusiasmo, que invadió hasta (*even*) los rincones más recónditos de la Península, no quedara más que unos cuantos aparatos abandonados y unos centenares de radioescuchas (*radioyentes*) desilusionados. Tal era el estado de cosas en España cuando se fundó la sociedad Union Radio con el propósito de unificar las varias concesiones existentes y establecer la coordinación indispensable al desarrollo de un sistema radiodifusor que colocara a España a la altura de las naciones vecinas.

(continuará).

W. F. BLETCHER.

ESPERANTO

SUBE ni presigas la tekston de radio-parolado kiun s-ro Alfred Dormanns dissendos en Esperanto kaj aliaj lingvoj el stacioj Langenberg (635 kc/s, 473 m., 17 kW.) kaj Köln, München kaj Aachen, je la 7.30—8.0 atm., dimanĉon, la 9an de novembro, 1930. La legado estos tre interesa kaj utila por lernantoj de Esperanto, kaj ni rekomendas al ĉiu aŭskulti ĝin.

Naturscienco: La miriga mondo de la akvoguto; temp-lupea filmo kaj mikroskopo; 3000 rembatoj dum unu minuto; polifemo en la akvoguto.

La Viena universitata profesoro d-ro Otto Storch sukcesis kombini mikroskopon kaj templupean filmon kaj per tio pligrandigi space kaj tempe la mirigan mondon de la akvoguto. Ni scias, ke tia akvoguto enhavas senfine malgrandajn graciajn animaletojn. La temp-lupea filmo nun montras al ni iliajn rapidegan vivon kaj viglegajn movojn. Estas eble fari 100 ĝis 200 bildetojn dum unu sekundo per la templupeo. Ĉe tia rapideco ni ne povas rigardi ilin, ni vidus nur trembriletojn, ĉar nia okulo estas kapabla diferencigi nur 16 ĝis 18 bildojn dum unu sekundo. Pro tio, ĉe la projekcio, la rapideco estas malakcelata sep-ĝis ok-foje. Ankaŭ tio ankoraŭ ne sufiĉas, ĉar la movadoj de la mikroskopaj animaletoj estas tro rapidaj. Tial oni prezentas al ni unuopajn bildojn el diversaj filmoj, kiuj ebligas al ni diserigi en iliaj detaloj la movadojn ĝis nun nekonatajn. La rezulto estas jena: Kopepodo (rempiedulo aŭ saltetulo) faras 3000 batojn per siaj membroj dum unu minuto; tio signifas: en la sesdekona parto de unu sekundo ĝi faras unu rembaton. En akvoguto oni vidas animaleton, kiu estas nomata polifemo pro sia granda okulo, rapidanta zigzage tra la akvoguto. Tie ĉi tia animaleteto kunpuŝiĝas kun alia enloĝanto de la akvoguto, kaj jam post unu centdudekono de sekundo la trafito sin savis de sia malamiko. Sed plej mirige estas, ke oni povas vidi batantan koron en amfipodo tute diafana. Mirinde, ĉu ne?

NOTES: Rembato, stroke, as in rowing; space kaj tempe, in space and time; trembrileto, glimmering, flickering gleam; malakceli, to slow down (akceli, to accelerate); sep-ĝis ok-foje, seven or eight times; unuopaj bildoj, single pictures; diserigi, to split up into units (dis-, separate, apart; -er-, a unit; -ig-, to cause to be); sesdekona parto, a sixtieth part; kunpuŝiĝi, to collide; enloĝanto, inhabitant; centdudekono, a hundred-and-twentieth part.

RADIO-DUO.

Lights and Shadows

A Grim Contrast in Broadcasting

OCTOBER 25, 1930, will remain an outstanding date in broadcasting, for it showed in the space of a few hours a contrast of anguish and mirth, deadly pain and joy, mourning and gladness.

I was on the alert on that drizzling, cold morning when, at 8.30, all the German and Austrian wireless stations switched on to Langenberg for the broadcast of the funerals of the 262 victims of the Alsdorf pit disaster.

The mine speeches delivered before the tragic biers lasted exactly forty minutes.

A bell obstinately continued to ring far away, while the words of woe dropped, one by one, slowly, with that accent of grief so sorrowful in its German syllables.

As the speaker observed, this report was the most pitiable a German microphone has ever broadcast.

What struck me most was a phrase spoken by one of the orators, who said: "Leiden und Liebe haben sich hier gefunden" (Suffering and love have met here). They are characteristic of the German resignation.

Still more peculiar to Germans was that other strong exclamation: "We do not wail, we do not groan; we live with our dead."

Brevity was the note of each speech, the end of which was responded to with a heavy silence—only interrupted by a faint sob. A sob, a real sob through the loud speaker! Who would have dreamt of such a tragedy?

Would it not have been more decent to switch off? I do not know. But I listened on.

Then the Langenberg announcer again came to say they were loading the 262 coffins upon the coaches.

Solemn organ music was played during the sad work.

It took such a long time that the speaker had to come again and say that the last coffins were about to be put on the lorries.

At length—almost three-quarters of an hour afterwards—the eyewitness report was resumed.

Short phrases fell wearily in the heavy atmosphere surrounding the great mystery of death.

"... The 150 of Alsdorf's dead are now passing the main street of their town for the last time. . . ."

"... There are many wreaths, many . . . one carried by six men. . . . The sun has shyly come out. . . . Its rays are cold."

Next the service in the church, then the last journey to the cemetery, and the deep graves. The microphone did not lose one scene of the ceremony. It did not spare our awestricken curiosity and anxiety.

One hour later I was tuning in to Radio-Paris with the hope of hearing some invigorating music, when shouts and bravos filled the room.

A clear, warm, enthusiastic French voice told in quick syllables:

"... The Question Mark is taxi-ing towards us . . . it has now stopped. . . . The crowd mobs the victors of the Atlantic! . . . Costes is smiling. . . . Bravo! Bravo! Vive Costes! Vive Bellonte!"

Through the microphone exclamations and interjections, gay remarks and laughter mingled and danced.

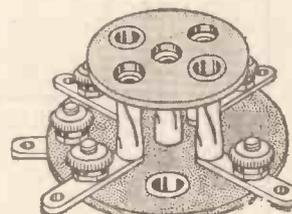
Three hours afterwards at the Hôtel de Ville, the reception ceremony of Costes and Bellonte was broadcast by Radio-Paris.

Nearer to us by thousands of miles, the airmen who had spoken to the world from Washington expressed their thanks with the same accents, with the same tones.

"... Au balcon! Au balcon!" shouted the multitude, massed on the Place de l'Hôtel de Ville.

(Continued on page 725.)

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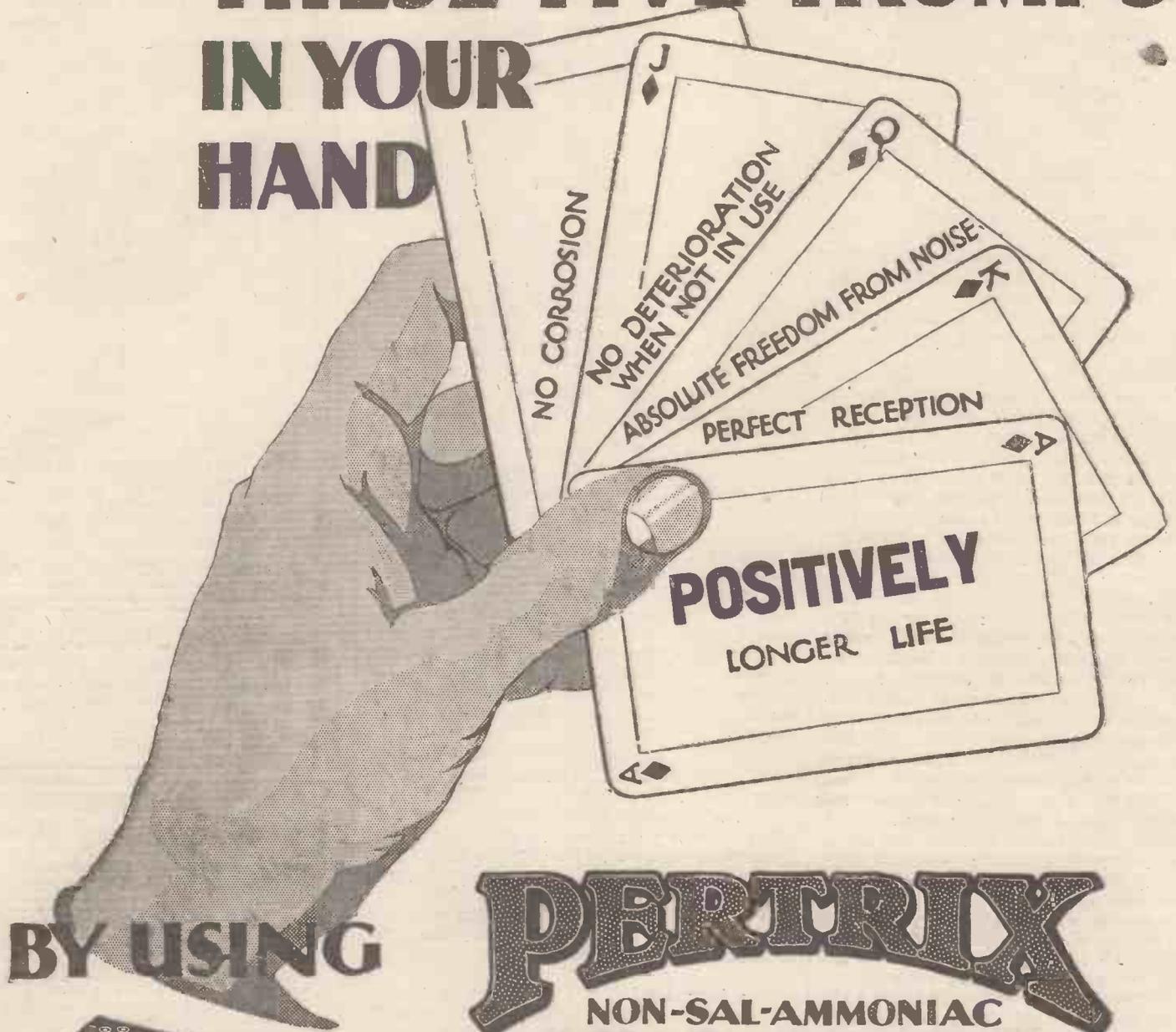
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TECHNICAL SECTION

A Short-Wave Superheterodyne Adaptor

THERE is often a desire on the part of listeners to use a normal broadcast receiving set on the short-wave band. With some receivers this can be done, more or less successfully, by the simple expedient of plugging in suitable coils. Many sets nowadays, however, especially factory-made sets, incorporate switching devices for wave-band changing, and if such a set, as is usually the case, has at least one H.F. stage, the only satisfactory method of operating it on the short-wave band is to use an adaptor of some kind. The ordinary type of short-wave adaptor permits only the L.F. stage, or stages, of the broadcast receiver to be utilised.

The following is a description of a simple short-wave superheterodyne attachment which has been found to work very well in practice, and which may be used with practically any receiver incorporating one, or more, H.F. stages, and which enables all valves in the set to be used.

If the adaptor is to be used with a fairly high H.T. voltage, say 200 volts, the circuit shown in Fig. 1 is recommended.

The oscillator valve is one of the H.L. class and consumes about 2½ m.a. anode current when working, the particular circuit arrangement used giving a very stable oscillation over the complete frequency range covered by the tuning condenser (0.0001 mfd.), which, in the case of the smallest coil used, is from 15½–25 metres.

The 50,000-ohm resistance in the oscillator plate circuit performs a triple function, it serves to de-couple the valve from the rest of the system, to avoid excessive H.T. voltage on the plate by means of the voltage drop across it, and, finally, it helps to stabilise the generation of H.F. oscillations.

The 100,000-ohm resistance in the detector valve plate circuit, which valve, incidentally, is one of the special detector class developed recently, de-couples the valve, gives the necessary voltage drop for the correct operation of the valve, and the super-sonic H.F. potential developed across it are passed on to the H.F. stage of the broadcast receiver by the 0.0003 mfd. coupling condenser.

As the detector valve of the adaptor operates on the bottom bend principle, a 4½-volt grid-bias battery (flashlamp size), tapped at 1½ and 3 volts, will be required. The best negative bias value for the type of valve indicated will

should be near to the valve so that the connections may be kept as short as possible.

If the available H.T. is considerably lower than 200 volts, the circuit shown in Fig. 2 should be adopted. The H.F. choke in the oscillator circuit may consist of 100 turns of No. 36 S.W.G.—d.s.c copper wire on a rin. diam. former, while the choke in the detector circuit should be of the standard long-wave pattern. In this case, the 5,000-ohm resistance, which is optional, serves to stabilise the oscillator.

A refinement, shown in Fig. 3, (page 722) is the addition of capacity controlled reaction to the detector valve, but, normally, the 0.0001 mfd. anode by-pass condenser, indicated in Fig. 1, will prevent a reduction in signal strength, which might occur owing to out-of-phase H.F. feedback from anode to grid.

The oscillator is coupled to the detector *via* the aperiodic aerial coil, which is the writer's own arrangement. With a good oscillator valve, the coupling of each

When the adaptor has been connected up, the broadcast set should be adjusted to the lower portion of the 200–550-metre range, say to 270 metres, observing that it is important not to tune the set exactly to the channel of a neighbouring broadcast station, as in this case the station will act as a separate heterodyne, and produce a whistle on all short-wave stations tuned in. If the broadcast receiver has some form of aperiodic aerial circuit, the calibration

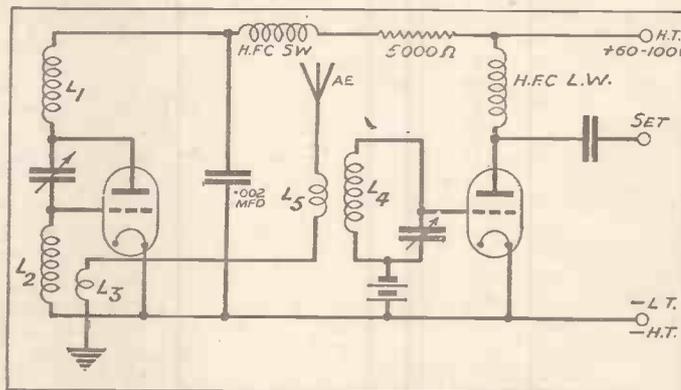


Fig. 2—Modified circuit for anode voltages of 60–100 volts

COIL SPECIFICATIONS

WAVELENGTHS Metres	OSCILLATOR		DETECTOR	
	Coil No.	Turns	Coil No.	Turns.
15–25	L ₁	3	L ₄	4
	L ₂	3	L ₅	2
	L ₃	2	L ₆	3
20–40	L ₁	5	L ₄	7
	L ₂	5	L ₅	3
	L ₃	2	L ₆	5
35–90	L ₁	8	L ₄	10
	L ₂	8	L ₅	4
	L ₃	2	L ₆	5

Spacing between oscillator coils, ½ inch, and between detector coils, ¼ inch. All coils wound on 2½ in ribbed former with No. 20 s.w.g.—d.c.c. copper wire, adjacent turns close together.

portion of the aerial coil to detector grid and oscillator grid circuits respectively can be made fairly loose.

The method of connection of this adaptor to the existing broadcast set is very simple; there are in all only five connections to make; three of them, L.T. and H.T. batteries, positive and negative, can be connected permanently if desired, and a switch can be provided in the L.T. positive lead for switching the adaptor on and off. If this is done, all that is required to put the adaptor into operation is to transfer the aerial from the broadcast set to the aerial terminal of the adaptor and join the terminal marked "Set" on the adaptor to the aerial terminal on the broadcast set. It is immaterial what kind of aerial circuit is in use in the broadcast

of the tuning condensers will only be upset slightly, and a satisfactory setting will result if both tuning condensers are adjusted to 5 degrees above, say, the London National channel.

If any doubt is felt about the accuracy of this method, adopt the alternative plan of causing the detector circuit of the broadcast receiver to oscillate feebly, and rotating the H.F. tuning condenser, with the attachment in circuit, until resonance is indicated by the characteristic "breathing" sound emitted by the loud speaker.

Tuning Operations

The next step is to start searching on the short-wave adaptor, beginning with the 20–40 metre waves, and using the coils specified in the accompanying table. The tuning of the oscillator will be found to be much more critical than that of the detector, and a slow-motion tuning dial will be found essential here, and, in fact, very desirable for both condensers. When first searching, the broadcast set should be just oscillating (there is very little danger of a set used in this manner radiating), then, as the tuning and oscillator dials are rotated, slowly, step by step, the short-wave stations tuned in will have the characteristic whistle of a C.W. station heard on an oscillating long-wave set. In this condition the adjustment of the S-W tuning (detector) condenser is not at all critical.

Having heard the "chirp" of the short-wave station's carrier wave, and adjusted both dials so as to obtain the loudest and lowest-pitched note, reduce reaction on the broadcast receiver to stop oscillation, and the short-wave transmission should be heard clearly. It must be remembered that there will be two settings on the oscillator condenser dial for every station tuned in, and, when making notes of the dial settings for future reference, it is as well to find and note these alternative adjustments which may be, say, from 10 to 30 degrees apart.

The tuning operations described, although they will be found quite simple when a little experience is gained, call for a certain initial patience. The adjustment of the oscillator dial is very critical, and this fact, together with

(Continued in column 3, page 722)

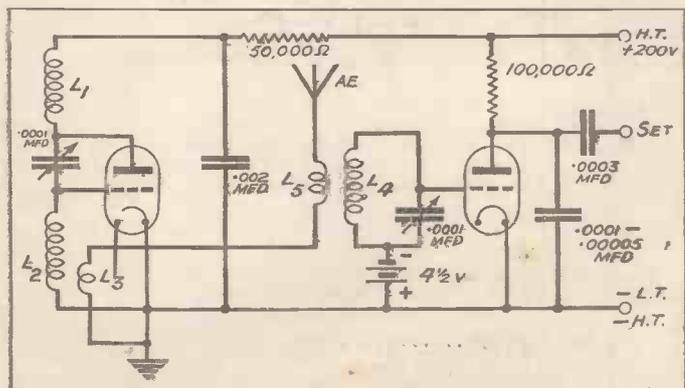


Fig. 1.—Circuit arrangement adopted with H.T. supply of 200 volts

generally be 4½ volts, but possibly with some valves, operated with a lower anode voltage, 3 volts may be found more advantageous. It is also important that the grid-bias battery

cast set, although most modern sets with an H.F. stage incorporate a so-called "aperiodic" aerial system, for which arrangement this adaptor was originally designed.

Kootwyk Short-Wave Station

(From our Correspondent at The Hague)

IN the issue of *World-Radio* dated August 3, 1928, there appeared a description of the Dutch-Indian Wireless Station at Kootwyk, Holland. Since then alterations and extensions have been in progress which are now nearing completion. At that time, so far as the short-wave transmitters were concerned, there existed only the old single-stage telegraph transmitters and the two telephone transmitters which possessed very simple, if not primitive, aerial systems. All the apparatus was then housed in a temporary wooden shed in which was also the locomotive engine belonging to the station.

All this has now been replaced by an entirely new short-wave station situated half-a-mile away from the still existing long-wave station, of which the architectural characteristics were described in the previous article referred to. The designer of this new station is Dr. N. Koomans, the chief of the Post Office Technical Service's wireless department, and, as far as possible, all the materials are Dutch and all the work has been done by Dutch people.

On the new site three stone buildings have been erected, all of a simple character, but well suited to the purpose, while the distance from towns and railways ensures freedom from disturbance. In the first of these buildings are four telephone transmitters; in the second, the new telegraph transmitters, while the third one, at present empty, will shortly accommodate a completely new short-wave station.

The four new telephone transmitters are intended to be used for traffic with the Netherlands East Indies, and can in an emergency be used also as telegraph transmitters. They are amongst the largest in the world, and each develops an anode energy of 80 kW in the last stage. Of the four transmitters, two may be used simultaneously. On the right of the entrance are the transmitters PCK (wavelength 16.3 metres) and PDK (wavelength 28.8 metres) which, having the same high-tension and modulation equipment, cannot be used at the same time. As a rule the shorter wavelength is employed, but the longer one is frequently used in the afternoons. On the other side of the building are the transmitters PCV (16.85 metres) and PDV (38.3 metres) which correspond,

the Heising (choke control) modulation system. The modulation transformer weighs no less than 4 tons and is erected behind the switch-board. This "stage" comprises six water-cooled valves, each of 15 kW, and there is a "sub-modulator," which comprises a 1.5 kW valve.

To ensure the safety of those in the building, the transmitters are entirely enclosed by metal casings so that it is impossible to come into contact inadvertently with any "live" parts. Moreover, in case anything has to be done to the gear inside any casing, pressure on a single knob cuts off the power immediately, while each stage may be cut off separately if desired. Similarly, in case of emergency, the whole of the power of the station can be cut off by a single movement. Should the cooling water cease to operate on a single valve the whole transmitter automatically stops.

The aerials for the beam transmissions, one for PCV and one for PCK, are both of the latest design emanating from the Dutch Post Office Technical Service. Each beam aerial consists of 32 horizontal "doublets" hung in four rows of eight, one row above another, between wooden frame-work masts 200 feet high, which, with those for the telegraph transmitters, give the landscape the appearance of a large oil-mine. The connection of the vertical feeders with the central feed is so arranged that the distance between this point and each of the vertical wires is the same.

At about a quarter wave-length behind this aerial, is a "reflector" which corresponds in every detail with the transmitting aerial itself.

at present in use, though it is expected that the other three will be working before the end of the year. Three transmitters, together with a long-wave transmitter which is still retained for use at those periods when short-wave transmission is difficult, are reserved for transmissions to North America, and the other two for transmissions to Buenos Ayres, which service, it is hoped, will shortly be in operation.

Very interesting, too, is the "Studio" or control and amplifier chamber, which is in a small building apart. The whole of the apparatus is protected within copper casings, as will be seen from the photograph (Fig. 2). Here are the amplifiers which give the incoming line-telephone messages the power necessary to actuate the transmitter, to which they are passed by means of cables. Here the modula-



Fig. 2.—The control and amplifying equipment

tion is controlled and the quality of the transmissions is checked, while in this building also are the tape machines which record both outgoing and incoming telegraphic messages.

Short-Wave Reception

Readers' Reports

WE are desirous of ascertaining whether, in view of the increasing interest which is being taken in short-wave reception, the publication in *World-Radio* of summarised reports, from readers in all parts of the world, would be of interest, and whether such reports would be forthcoming in sufficient numbers to make publication worth while. It is thought that the exchange of short-wave reception experiences, through the medium of our columns, will prove of considerable utility to owners of short-wave sets, both in the matter of comparison of results, and in the identification of transmitting stations.

To facilitate the collation and summarising of information, it is necessary that reports should be extremely brief, but complete in essential details, and readers desirous of co-operating are invited to send in reports, giving the required information on one side only of a sheet of letter paper, or on a post-card—addressed to the Editor of *World-Radio*, Savoy Hill, London, W.C.2.

Will readers please note that queries regarding the identification of stations will not be dealt with under this heading? We give below the form in which reports should be made, and, by way of example, a report is given in *italics*.

Date Nov. 1, '30.
 Time 11.0 p.m.
 Station Georgetown, British Guiana.
 Call heard VRY.
 Wavelength 43.86 metres.
 Programme Church-service.
 Strength Moderate L. S.
 Remarks Slow fading.
 Receiver (type) .. Super-Het. Adaptor and 1-v-1.
 Name and address

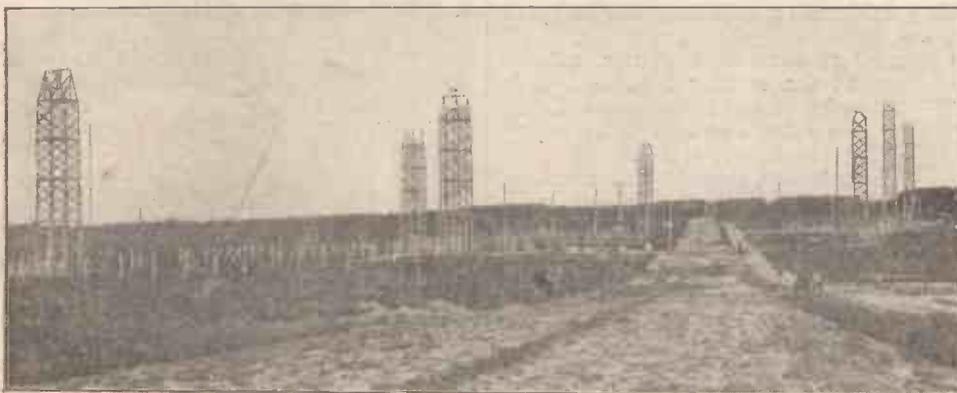


Fig. 1.—General view of the aerial masts at Kootwyk

constructionally, with the other two. The transmitters are all crystal-controlled, and each consists of five stages, the final stage comprising four water-cooled transmitting valves, each of 20 kW anode energy.

Just as in the old temporary wooden building, the telephone transmitters here are worked on

By this arrangement and by means of a change-over switch, the two beams which are normally directed towards the East Indies, may be reversed so that the direction becomes that of America and the West Indies.

In the second building are eight short-wave telegraph transmitters of which five only are

Ultra-Short Wave Experiments

By E. W. B. GILL and R. H. DONALDSON

The term "ultra-short" is applied to waves of 10 metres, or less, in length. The following article describes a method of generating such waves and of measuring their length with an ordinary rule.

EVERY experimenter who has tried to generate very short waves using ordinary circuits, finds that, even when the oscillatory circuits external to the valve are made as small as they possibly can be consistent with oscillations occurring, the wavelength is still about two metres or so. It is possible, however, to obtain much shorter waves by an entirely different arrangement, but unfortunately no one has ever managed to obtain oscillations of any appreciable strength. It is possible to detect the oscillations indirectly by the use of quite simple apparatus, but actually to measure the strength of the oscillating currents requires a thermo-couple and galvanometer.

A simple preliminary experiment can be performed with a milliammeter and a small transmitting valve. Instead of applying the H.T. positive potential to the anode, and the H.T. negative to the filament, with a grid bias of a few volts, as is usual, the H.T. positive, say 120 volts, is applied to the grid, the H.T. negative being connected, as usual, to the filament; while what may be called an anode bias, of about 1½ volts negative, is applied, the negative of the bias battery being joined to the anode and the positive to the filament.

The milliammeter must be connected in the lead to the anode, and the filament should be heated up gradually by the use of a rheostat, when it will be found that at a certain temperature the milliammeter shows current, indicating that electrons are reaching the anode from the filament. This result is rather more remarkable than appears at first sight because, if the only potential differences present are those applied, it is physically impossible for an electron to get from the filament to the anode, as the anode is more negative than the filament and the electrons, having a negative charge, are, in consequence, repelled from the anode. The fact that the grid is highly positive in no way affects this argument.

The Barkhausen Oscillations

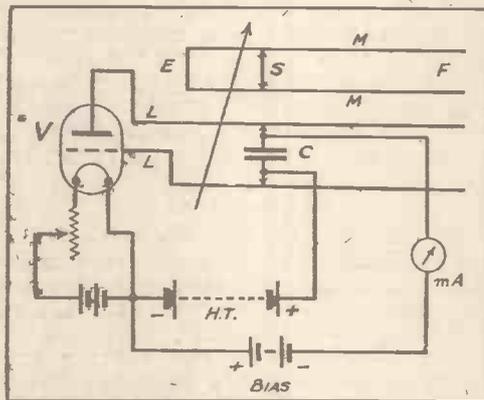
The reading of the milliammeter indicates therefore that something abnormal is occurring, and Barkhausen, the first to study this phenomenon, found that it was due to short-wave oscillations. The main capacity of the oscillating circuit is that between the grid and the anode of the valve, the remainder of the oscillating circuit comprising the leads inside the valve, and portions of the external leads. It is obviously undesirable to have oscillations running in unknown ways along the leads, and the next experiment involves the construction of the complete short-wave generator which is shown in the accompanying diagram.

Referring to the figure, L L are two parallel wires joined to the anode and grid respectively, of the valve V. The distance apart of the wires is not important, about 5 to 10 cms. is convenient, and their length should be about one metre. C is a fixed condenser, say 0.001 mfd., having really good insulation. This condenser should be arranged to slide along the wires so that each terminal makes continuous contact with one of them. The anode and grid battery leads are connected to the condenser as shown in the diagram; A being the milliammeter.

The previous experiment can now be repeated in a modified form. Adjust the filament current, gradually, until the milliammeter shows current, then slide the condenser C along the wires until the current shown by the milliammeter

is a maximum. The oscillations are then of greatest amplitude and the current oscillates from the valve, along the wires L L as far as the condenser C, but no farther. The position of the slider for maximum current depends solely on the voltage applied to the grid for any particular valve, which indicates the rather surprising result that the wavelength of the oscillations depends only on the grid voltage and type of valve, and not on the externally applied circuit.

Owing to the extreme weakness of the oscillations it is not easy to do much with them, but there is a simple method of measuring their wavelength. A circuit is arranged, as shown in the diagram, consisting of two parallel wires, M M, about 5 metres long and 5 cms. apart, joined at the end E, and open at the end F. This circuit is coupled, fairly closely, to the oscillating valve circuit. A metal strip S, bridging the wires, is placed close to the end E and gradually made to slide along them towards the open end F. As the bridging strip is moved towards F it will be found that at certain positions, equidistant from each other,



The ultra-short wave circuit

the reading of the milliammeter will fall to zero. In these positions the coupled circuit, or one of its harmonics, is in tune with the oscillating valve circuit and, owing to the damping due to the tight coupling, the valve is unable to maintain the weak oscillations. If the coupling is too tight the milliammeter reading will be reduced to zero for a considerable range of movement of the slider S, and the coupling should be reduced until this adjustment is more critical and the range is not more than half a centimetre.

The distance between any two consecutive positions of the slider measured along the parallel wires M M, for zero reading of the milliammeter, is half the wavelength of the oscillations generated by the valve. By this method the wavelength can be ascertained with great accuracy, and can actually be measured with an ordinary rule, graduated in centimetres.

With small transmitting valves and a grid voltage of 120 volts, the wavelength is about 80 cms., still shorter waves being obtainable by the use of higher voltages. Care should be taken that, with higher voltages, the grid of the valve does not get too hot and collapse.

(Continued from next column)

istics for either anode bend or gridleak rectification are features common to most types. Last, but by no means least important, practical tests show that delightfully smooth reaction control is obtainable with these valves.

To the long-distance man it is essential to have a first-rate detector, sensitive, non-microphonic and permitting smooth reaction. The introduction of one of the new valves will make a great difference to many receiving sets, and should prove particularly useful in the short-wave receiver.

R. W. H.

Ultra-Short Wave Transmitter for Berlin

AT the recent conference of the Heinrich Hertz Society for the Furtherance of Broadcasting, Professor Leithäuser announced that the latest results of the experiments with ultra-short waves, begun by Professor Esau, of Jena, were most promising.

The opinion of Professor Leithäuser, and of other experts connected with the above-mentioned Society, is that, owing to the restricted number of broadcasting wavelengths available, and the inherent difficulties of the common-wave system, bad reception conditions exist at present in many cities where there is no local transmitter, and one of the problems requiring attention is to find a means of providing such cities with a satisfactory broadcasting service.

Professor Esau, whose work in connection with short and ultra-short waves is well known, proposed, some time ago, to solve the problem by utilising for broadcasting the ultra-short waves, i.e., waves under ten metres in length. At the beginning of the year, laboratory work had advanced sufficiently to enable test transmissions to be started at Chemnitz, in the Central German district.

In practice, new difficulties were encountered. It was observed, for instance, that since the ultra-short waves travel in a kind of beam, somewhat similar to light, there were occasions when reception was restricted to one particular corner of a room, in any other position in the room reception was impossible. Also, in spite of considerable advances which have been made, the modulation of ultra-short wave transmitters remains a very difficult matter.

The latest results, however, have proved very encouraging. By repeated tests, favourable wavelengths have been found which overcome the previous difficulty of restricted directional reception and can be received perfectly anywhere within a radius of about eight miles. The wavelengths in question have the additional advantage of being comparatively free from interference by electrical machinery and apparatus.

The tests made at Chemnitz have been so successful that the German Post Office authorities have decided to take the matter in hand, and to carry on further research and experimental work. It is their intention to install, almost immediately, an ultra-short wave transmitter at Berlin and, in order to hasten the experiments, a number of observation posts have been organised, but these have not yet been equipped, because it was found that the necessary apparatus could not be obtained from manufacturers in the quantities required by the postal authorities.

Detector Valves

IN the past it has been necessary to use a valve of the medium impedance, or general purpose class, as detector in the wireless receiving set, for the simple reason that nothing else was available. The ideal valve for the purpose would combine a high magnification factor with a comparatively low impedance; it would, in other words, have an excellent mutual conductance figure. Further, the best characteristic would not be quite the same as that to be looked for in a high-frequency or a low-frequency amplifying valve. If the valve is intended for anode bend detection there should be very pronounced concavity in the lower part of the grid volts—plate current curve, while, for gridleak-and-condenser rectification, the shape of the grid current curve is of considerable importance.

Many valve makers have now paid particular attention to the production of special detector valves, and at the moment there are some excellent specialised types on the market. Improved suspension of the filament, high mutual conductance, and excellent character-

(Continued at foot of col. 2)

Choosing a Wireless Receiver

2.—Non-Portable or "Aerial" Sets

THIS year's exhibitions contained an extremely wide range of sets designed to work on either outdoor or indoor aeri-als, and it would, indeed, be a difficult task to pick out one set having overwhelming advantages over all others. The mains-driven type of set was particularly to the fore, and it seems certain that this type, and the mains-driven transportable type already discussed will be the most popular types of wireless receivers in the future, except, of course, in those districts where there is no electricity supply.

Aerial sets employing from two valves up to seven or eight valves can be obtained. For loud speaker reception of the "local" station, and possibly the occasional reception of a foreign station, the two-valve set is generally highly satisfactory. It is extremely simple to handle and very cheap to maintain. For those who aspire to receive a selection of more distant stations there are the three- and four-valve types. The three-valve sets are practically all similar technically, though not in appearance, to the two-valve type, with the addition of a stage of screen-grid high-frequency amplification. This, of course, gives them a much greater range, and also makes them extremely suitable for "local" reception under very adverse circumstances, such as in districts where reception conditions are poor, or in cases where it is difficult or impossible to erect a reasonably efficient aerial.

Receiving Distant Stations

Sets having four or more valves can be relied upon to provide satisfactory reception under almost any reasonable conditions, and, when used with an efficient aerial, are usually capable of receiving the programmes of a number of Continental stations at good loud speaker strength. They are, moreover, particularly suitable for use in districts where there is no "local" station, such as, for instance, certain parts of the West of England and Scotland.

It must not be taken for granted that a set having, say, four or five valves is necessarily capable of providing very large volume of reproduction on a loud speaker. The output of a set depends almost entirely on the design of the last stage of amplification and the valves employed; thus, one five-valve set may comprise two high-frequency stages, detector, and two stages of low-frequency amplification, while another has one high-frequency stage, detector, and one low-frequency stage, followed by two large power valves connected in "parallel," or in "push-pull." The former would almost certainly have a very high degree of sensitivity, and would be very suitable for the reception of comparatively weak signals at reasonable volume on a loud speaker. The latter, while, perhaps, less sensitive, would, if well designed, be capable of delivering very considerable volume with excellent quality of reproduction, and would be particularly suitable for use in connection with a loud speaker of the moving-coil type, or the larger of the reed-driven cone type.

Maintenance Costs

Aerial receivers of the types described may be obtained to work from batteries, or from the electric mains. The maintenance costs of a two- or three-valve set working on batteries, and designed to give a small output volume, will be even less than the figures given for battery-driven portable sets, while sets having four or more valves will, naturally, cost proportionately more, according to the type of valves fitted. It is not, however, an economical proposition to run a multi-valve set, using large power valves in the output stage, from dry batteries.

If it is desired to use such a set, and re-charging facilities are reasonably good, high-tension accumulators are suggested as a reliable and more economical source of high-tension current supply; ordinary low-tension accumulators being used for the supply of filament current.

The remarks regarding the maintenance of mains-driven transportable sets apply equally to aerial sets which derive their current supply from the electric light mains. Again, supposing the cost of current to be sixpence per unit, the cost of running a two-valve set will probably work out at about a penny for eight hours, while a five- or six-valve set with large output valves will not usually consume more than about 120 watts, the cost of current being less than a penny per hour.

As already mentioned, either an outdoor or indoor aerial may be used; it should be remembered, however, that the "pick-up" on the latter is very much less than on the former type, and to obtain similar results it will be necessary for the set to have a higher degree of amplification. Generally speaking, the extra signal strength obtained from a good outdoor aerial, as compared to an indoor one, is roughly comparable to that provided by an extra valve.

Headphone Reception

So far, reception on loud speakers only has been considered, and there still remains the type of set suitable for working headphones. There are many people who prefer the intimacy of listening with headphones, apart from the number of people who cannot use a loud speaker on account of the interference which may be caused to others. It is thought by many that a loud speaker is the natural corollary to a valve set, but actually a small valve set, with one or two valves, is eminently suitable for use with headphones, and, moreover, is usually capable of working a number of pairs.

A one-valve set usually provides perfectly satisfactory reception on headphones anywhere within the service area of a broadcasting station, when used with an outdoor aerial, or on an indoor aerial within, say, thirty to forty miles of a high-power station such as the London or Midland Regional. Where ample reserve of power is required, however, or if it is thought that it may be desired to use a loud speaker at a later date, a two-valve set will prove a good investment. There were several two-valve sets on exhibition at Olympia, at prices which, a year or two ago, would have seemed the height of optimism.

It is not recommended that headphones should be used with a mains-driven set of any kind, unless special precautions are taken. Mains receivers are perfectly safe when used with a loud speaker, as they are designed to be, but quite apart from the danger of shocks which may exist with the use of headphones, the power output is generally considerably more than is required for the satisfactory operation of headphones. The maintenance cost of a one- or two-valve set working headphones, and supplied from batteries, is very slight. A small two-volt cell costing only about five shillings to purchase, and not more than sixpence to re-charge, will run the set for at least a month, while a sixty-volt high-tension battery will last from six months to a year.

There were also several one- and two-valve portable sets at Olympia; these are intended for use with headphones, and, in at least one make, a compartment for 'phones was provided in the case. This probably forms the ideal type of set for people who desire headphone reception

(Continued at foot of next column)

A SHORT-WAVE SUPERHETERODYNE ADAPTOR

(Continued from page 719)

the complete absence of background noise may easily give the impression that the adaptor circuit is not working properly.

Failure to obtain results may be due to the oscillator valve not functioning. It is important to see that the grid and anode coils are connected up in the right "sense." If both coils are wound on the former in the same direction, the top end of the lower coil should go to the grid, and the bottom end of the other to the anode. The best way of ascertaining whether the valve is oscillating, is perhaps by connecting a pair of telephones, or a milliammeter, in the anode circuit, and listening for a "click" (or observing a deflection) when the grid terminal is touched with the forefinger, which stops the oscillation.

If reaction is used on the detector valve of the adaptor, as indicated in Fig. 3 (below), it should be adjusted to the minimum position when searching, at all events, until the user becomes familiar with the operation of the set, so as to avoid the slight complication in tuning

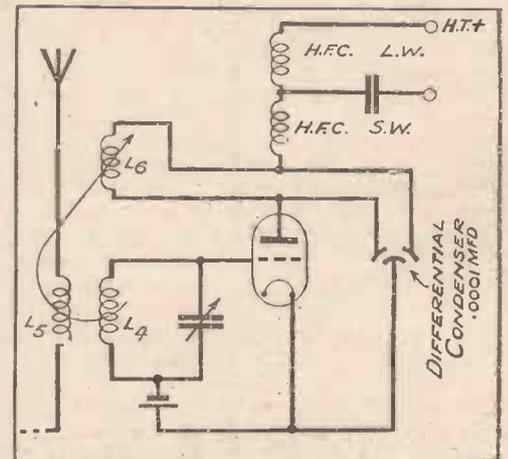


Fig. 3.—Method of obtaining reaction

which reaction introduces. Later, it will be found that by setting the reaction control below, but fairly close to oscillation point, a distinct "breathing" sound will be heard from the loud speaker when the two condenser dials of the adaptor are "in step." The short-wave receiver is then in its most sensitive condition, and a super-heterodyne adaptor, with reaction, in skilled hands, and a broadcast set comprising S.-G. stage—power grid detector—output stage, will bring in any short-wave station the field strength of which is above the noise level. The volume control on the broadcast set has often to be used on such stations as Zeesen, Rome, Bandoeng, and sometimes even W2XAD.

With standard six-pin ribbed formers, 2½ inches in diameter, the coils may be wound in accordance with the specification on page 719. The letters L1, etc., correspond to those in the diagrams, and the coils should be wound with No. 20 S.W.G.—d.c.c. copper wire.

E. J. A.

(Continued from previous column)

in different rooms, and for travellers. Even if it is found that the set has been taken to a district where it cannot receive the nearest station on its necessarily tiny frame aerial, this can easily be augmented by a small, temporary indoor aerial, slung from the picture rail or some other convenient support. The operation of these small valve sets, either the portable type just referred to, or the aerial type, is extremely simple, and no one need anticipate any difficulty in this direction. F. W. E.

Traders' Bulletin

No. 24 — The Simultaneous Broadcasting System

DURING the winter months, the system of simultaneous broadcasting by means of land lines calls forth a certain amount of criticism, mainly because it is more difficult to maintain the standard of performance to which listeners have become accustomed in the summer months. As traders may be questioned by their clients on this subject, it is thought that a survey of the present system of simultaneous broadcasting may be of interest.

It is well known that inter-station linking is effected normally by Post Office trunk lines, but transmissions before 6 p.m., except those of a very important nature, are relayed to provincial transmitters by wireless link. Permanent high-quality land line connections exist on a twenty-four hour basis between London and Daventry 5XX, and between certain other centres, such as Glasgow, Edinburgh and Dundee. The normal S.B. system is not usually employed before 6 p.m., owing partly to the greatly increased cost, and partly to certain technical difficulties due to interference being greater in periods of heavy traffic on the neighbouring conductors. It should be added, however, that an extension in the use of telephone circuits for more hours in the day may become advisable with the development of the Regional Scheme.

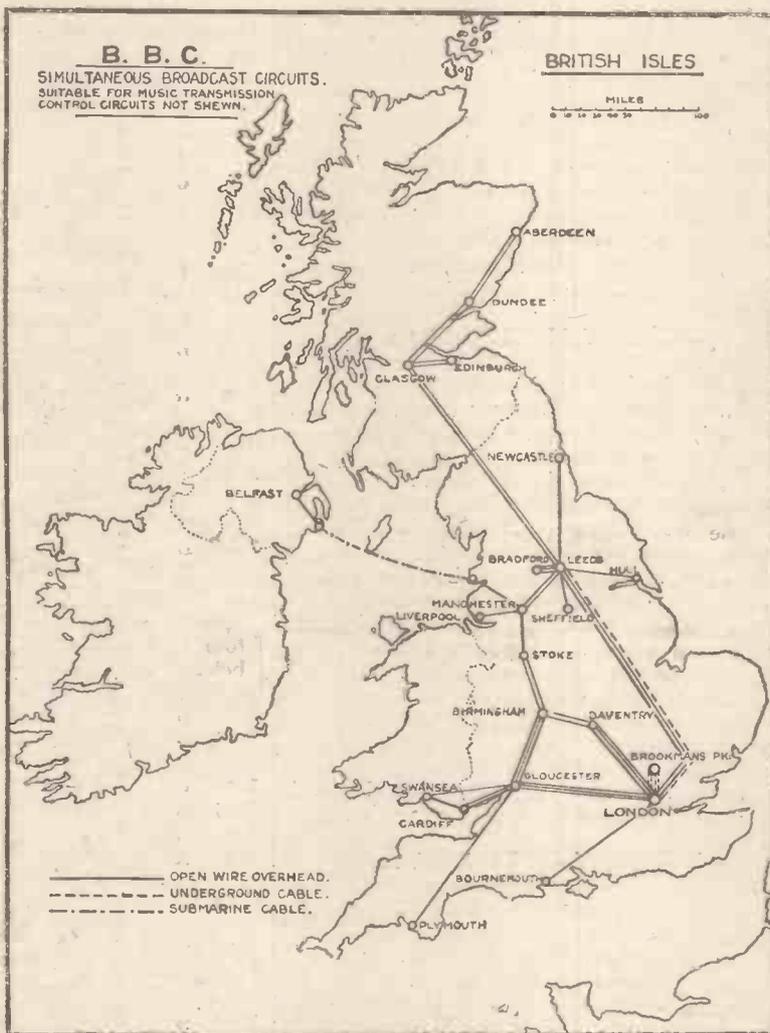
Two kinds of land line connection are now in use, namely, the buried cable route and overhead lines. The accompanying map indicates the present system of S.B. routes, the dotted lines showing the buried circuits, and the full lines the overhead circuits. For a broadcast service three main factors have to be considered: firstly, the reliability of the link; secondly, the ability to obtain a sensibly straight frequency response over the musical scale, and, thirdly, the absence, in the transmission, of line noise, cross-talk and other parasitic interference.

Considering the question of reliability, it is clear that buried routes are far less subject to faults than the overhead type of circuit, as they are free from such dangers as falling trees. On the other hand, it is only recently that it has been possible to use buried cables for linking over long distances.

It should be pointed out that a good frequency response over a far greater range of frequencies is demanded for the transmission of music than for ordinary telephone traffic, where intelligible speech is the main criterion of a satisfactory performance. A buried land line net-work having an over-all frequency response of, say, 400 to 2,500 cycles would in general be quite satisfactory for commercial

telephony, but almost useless for the transmission of music.

From this it will be observed that a choice has to be made between greater reliability on the one hand, and a practicable frequency response on the other. In the past this has resulted in the use of a far greater proportion of overhead than buried routes, but it has made it impossible to protect against sudden S.B. faults in abnormally bad weather, despite rapid changes from an overhead to a buried cable (with an inferior frequency response) when occasion demanded it. There is, at present, however, no buried cable between certain provincial cities, as, for example, Leeds and Newcastle, which could in any circumstances be used for the transmission of music,



and in such cases overhead lines, or wireless link, have been the only means of inter-station linking.

A new type of cable is now being laid by the General Post Office between certain important centres of population in the British Isles. This cable will be available very shortly for traffic between London and Manchester (via Leeds), and the system will subsequently be extended to Scotland and the West of England. It is anticipated that before long it will be available as a means of connection between all important centres. The construction of this cable differs from the old type of buried cable to an extent which enables it, after correction, to provide an almost straight frequency response characteristic from 50 to 7,000 cycles per

second. As "straight line" amplifiers or level raisers can be used, the loss due to equalisation can be made good without affecting quality.

At the present time 4,000 miles (8,000 miles of copper conductor) of G.P.O. telephone circuits are in use for S.B. purposes, approximately 85% of this being of the overhead type, 10% of the buried cable type, and 5% submarine. These circuits are in use for programme transmissions, exclusive of tests, for approximately 1,000 hours per week. The average number of faults reported per week for the whole system is fifty—i.e., one fault in every twenty hours of programme. The number of faults increases enormously in wet and windy weather, and at times has reached nearly three times the above figure. The average time taken to clear a fault is about four minutes, which is that necessary to bring a new circuit into use. In every transmission at least one stand-by circuit, with its correction, is available, although the better of the two circuits is in use for the transmission and is known as the "music line."

Outside Broadcast Lines

In addition to the long lines for inter-station linking, such as London to Leeds, or Leeds to Glasgow, short lines, usually of the buried type, are used for linking outside broadcast points to the central control rooms. Although usually short, these lines sometimes present peculiar difficulties of their own, and, in London especially, a number of different types of conductor are frequently encountered in linking together two points which may not be more than three miles apart. A circuit of this nature, perhaps five miles in length, is usually equivalent, electrically, to 100 miles of overhead circuit, so that they should be corrected to provide a uniform frequency response characteristic in much the same way as the long S.B. circuits. Nevertheless, these lines, being of the buried type, and fairly short in actual length, have an extremely high reliability factor.

Local Studio-to-Transmitter Lines

Facilities have, of course, to be provided for a highly reliable connection between local control rooms and their transmitters. In the past these transmitter lines were fairly short, as the transmitters were situated near the centres of the towns, and on an average not more than three miles from the local studios or control rooms. The new high power transmitters, however, are at a greater distance from the studios (e.g., Brookmans Park is seventeen miles from Savoy Hill, while the North Regional station is twenty-two miles from Piccadilly, Manchester). For reliability, buried cables will have to be employed and the availability of these high-quality buried circuits is one of the deciding factors in choosing the sites of the new transmitters. The Savoy Hill to Brookmans Park underground lines are, electrically, extremely long, 99.9% of the power input to the line being lost in the line and its associated corrector circuits. It may be of interest to note that, were correctors not used in this line, middle "C" on the piano would be received at Brookmans Park at thirty-two times the power of the top "F" on the piano. The distortion in the frequency response which would result needs no further explanation.

Space does not permit a description in the above Bulletin of the design of the various networks, corrector circuits, etc., which are employed in land line work. An article will appear in next week's issue of this journal dealing with networks of the type involved, to which we would refer any reader who wishes to go into the matter more deeply.

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PROGRAMME-SECTION

Continental Programme Events

SUNDAY, NOVEMBER 9

- Concerts**
11.0 a.m. Leipzig, Berlin, Breslau: Orchestral.
3.10 " Hilversum: Chamber Music.
7.0 " Oslo: Wagner Concert.
7.15 " Copenhagen: Orchestral.
8.0 " Milan, Turin: Orchestral and vocal.
8.0 " Munich: Siegfried Wagner concert.
8.15 " Brussels: Orchestral and vocal.
9.10 " Copenhagen: Orchestral.

- Operas and Operettas**
1.55 p.m. Frankfurt, Stuttgart: "The Pearl Fishers" (Bizet).
5.30 " Barcelona: Operatic relay.
7.0 " Berlin, Königs Wusterhausen, Leipzig: "Prince Igor" (Borodin).
7.0 " Breslau: Selections from "Tannhäuser."
7.0 " Hamburg: "Fidelio" (Beethoven).
7.0 " Langenberg: "The Shepherd King" (Mozart).
8.5 " Rome: "The Duchess of Chicago" (Kálmán).

MONDAY, NOVEMBER 10

- Concerts**
6.30 p.m. Budapest: Symphony concert.
7.0 " Algiers: Debussy chamber music.
7.0 " Copenhagen: Bach's "Christmas Oratorio."
7.0 " Frankfurt, Stuttgart: Mozart chamber music.
7.0 " Hamburg: Honegger's "King David."
7.0 " Vienna: Recital by Mr. Albert Spalding.
8.0 " Milan, Turin: Orchestral and vocal.
8.0 " Vienna: Symphony concert.
8.45 " Radio-Paris: Chamber music.
9.5 " Oslo: Chamber music.
10.0 " Barcelona: Chamber music.

- Operas and Operettas**
6.35 p.m. Munich: "Salome" (Richard Strauss).

TUESDAY, NOVEMBER 11

- Concerts**
6.15 p.m. Strasbourg: Mozart's "Requiem."
7.25 " Munich: Orchestral.
8.0 " Algiers: Oriental music.
8.5 " Rome: Chamber music.
8.15 " Brussels: Armistice Day concert.
8.30 " Leipzig, Königs Wusterhausen: Symphony concert.
8.40 " Vienna: Haydn chamber music.
9.30 " Radio-Paris: Beethoven's Symphony Eroica.

- Operas and Operettas**
8.0 p.m. Stuttgart, Frankfurt: "Ambition in the Kitchen" (Lortzing).
8.0 " Milan, Turin: "Turandot" (Puccini).

- Plays**
8.0 p.m. Langenberg: "Die Brautschau" (Gogol).
8.0 " Radio-Paris: Scenes from Raynal's play, "The Unknown Warrior."

- Other Events**
10.10 p.m. Brussels: Commemoration at the Menin Gate.

WEDNESDAY, NOVEMBER 12

- Concerts**
3.30 p.m. Hamburg, Königs Wusterhausen: Orchestral and vocal.
7.0 " Algiers: Symphony concert.
7.0 " Berlin, Königs Wusterhausen: Choral (Workers' Choral Society).
7.0 " Hamburg: Folk songs in old and modern settings.
7.30 " Oslo: Orchestral.
8.10 " Berlin, Königs Wusterhausen: Symphony concert.
8.15 " Brussels: Orchestral and vocal.
8.45 " Radio-Paris: Tchaikovsky's Violin Concerto.
9.5 " Oslo: Song recital by Mr. John Armstrong.

- Operas and Operettas**
6.0 p.m. Vienna: "Die rote Gred" (Bittner).
6.30 " Budapest: Relay from Opera House.
7.0 " Munich: "The Circus Princess" (Kálmán).
8.5 " Rome: "L'Africaine" (Meyerbeer).

THURSDAY, NOVEMBER 13

- Concerts**
7.0 p.m. Frankfurt, Königs Wusterhausen: Johann Strauss music.
7.45 " Hamburg: Choruses of five centuries.
8.0 " Langenberg: Symphony concert.
8.0 " Munich: Chamber music.
8.5 " Rome: Orchestral.

- Plays**
7.0 p.m. Hamburg: "Animals Accuse You" (Johannsen).
7.35 " Berlin, Leipzig: "Timon of Athens" (Shakespeare).

FRIDAY, NOVEMBER 14

- Concerts**
3.30 p.m. Leipzig, Königs Wusterhausen: Orchestral.
7.0 " Copenhagen: Orchestral and vocal.
7.0 " Hamburg, Königs Wusterhausen: Orchestral and vocal.
7.0 " Langenberg: Orchestral.
7.45 " Algiers: Gounod hour.
8.0 " Milan, Turin: Symphony concert.
8.0 " Vienna: Commemoration dedicated to C. M. Ziehrer.
8.10 " Brussels: "League of Nations" week, special concert.

- Operas and Operettas**
6.30 p.m. Berlin: "The Vice Admiral" (Millöcker).
7.15 " Breslau: "Violets from Montmartre" (Kálmán).
8.5 " Rome: "Paganini" (Lehár).
8.45 " Radio-Paris: "Mireille." (Gounod).

- Plays**
7.45 p.m. Munich: "Pygmalion" (G. B. Shaw).

SATURDAY, NOVEMBER 15

- Concerts**
6.30 p.m. Frankfurt, Stuttgart, Berlin, Königs Wusterhausen, Leipzig: Wagner concert.
8.15 " Budapest: Orchestral and vocal.
9.30 " Berlin, Breslau: Furtwängler concert.

- Operas and Operettas**
11.30 p.m. Langenberg, Königs Wusterhausen: "Entrez Messieurs, Mesdames" (Offenbach).

SHORT WAVE STATIONS

The times quoted are reduced to G.M.T.

M	Kcs	
80	3750	Constantine (Algeria) 8KR, MON., and FRI.
80	3750	Rome (Italy) 3RO, 9 kW. (aerial).
70.1	4280	Khabarovsk (U.S.S.R.), 9 a.m. to 12 noon.
61	4918	Radio LL (France), 0.5 kW.
58	5172	Prague (OKIMPT), TUES. and FRI., 7.30-9.30 p.m.
54.02	5550	New York City W2XBH, Relays WCGU.
52	5769	Bergedorf (Germany) AFL, 3 kW.
50	6000	Moscow, TUE., THUR. & SAT., 12 n.m.—1 p.m.
50	8000	Barcelona Radio Club EAJ25, SAT. 8-9 p.m. News and gram. rec.
49.83	6020	Chicago (Ill.) W9XF, Relays WENR, 5kW. SUN. 2-6.30 p.m. 9.30 p.m.—12 m't. 2-7 a.m. Weekdays, 4-5.45 p.m. 9.30 p.m.—1 a.m. and (ex. SAT.) 2.30-7 a.m.
49.83	6020	New York (W2XBR), Relays WBNY 1kW.
49.67	6040	New York (W2XAL), 0.25 kW. TUES., 12 m't.—5 a.m. WED., 12 m't.—2 a.m. FRI., 12 m't.—4 a.m. SAT., 12 m't.—3 a.m.
49.5	6060	Cincinnati (W2XAL) Relays WLW.
49.5	6060	Council Bluffs (Iowa) W9XU, 0.5 kW.
49.5	6060	Philadelphia (Pa.) W2XAU, 0.5 kW. Relays WCAU, Daily 2-9 p.m. THURS. and FRI., 2 p.m.—8 a.m.
49.4	6072	Vienna, 0.4 kW. TUES., 10 a.m.—12 noon. THURS., 2-3 p.m. SAT., 10 p.m.—12 m't.
49.34	6080	Chicago (Ill.) W9XAA, 0.5 kW. Relays WCFL, Daily 2-5 a.m.
49.34	6080	Newark (N.J.) W2XCX, Relays WSOR.
49.3	6085	Bangkok (Siam) HS2PJ.
49.22	6095	Toronto (Canada) VEGGW, 0.015 kW. Daily, 11.45 a.m.—5 p.m., 9 p.m.—5 a.m.
49.18	6105	Bound Brook (N.J.) W2XAL, 12 kW. Weekdays, 10-11 p.m. and 4-8 a.m.
49.02	6120	Richmond Hill, N.Y. (W2XE), 0.3 kW. Relays WABC, Dy., 1 p.m.—5 a.m. next day.
49	6122	Nairobi (Kenya) 7LO, Daily 4-7 p.m. Relays G5SW occasionally, 7-8 p.m.
48.86	6140	Pittsburgh East (W8XK), Relays KDKA, WED. and SAT., 10 p.m.—5 a.m.
48.8	6147	Manila (Philippine Islands) KZRM, Daily 8 a.m.—3 p.m. (Except Monday).
48.62	6170	Teguicgalpa (Honduras) HRB, 2.5 kW. Daily (except MON.), 1.30-5 a.m.
48.35	6205	Bogotá (Colombia) HKC, Daily, 3 p.m.
47	6382	Funchal (Madeira) CT3AG, THURS. and SAT., 10 p.m.—1 a.m.
44	6818	San Lazaro (Mexico) XDA, 3 kW, 1 a.m.
43.95	6840	Georgetown (British Guiana) VRY, 0.12 kW. SUN. 10.45 p.m.—2.15 a.m. THURS. 12.15 a.m.—2.15 a.m. Occasional evng. transmissions.
43	6976	Madrid (EAR10), TUES. and SAT., 10.30 p.m.—12 m't.
41.7	7194	Canary Islands, Testing nightly at 10.30 p.m.
41	7316	Radio Vitus, Testing.
40.2	7463	Lyons (Rhone) YR, Daily except SUN. from 4.30-5.30 p.m.
39.7	7556	Bogotá (Colombia) HKF.
37.02	8100	Bangkok (Siam) HS2PJ, TUES. 1-4 p.m. and 7-9 p.m. FRI., 1-4 p.m.
34.68	8550	Long Island (N.Y.) W2XV, Experimental. FRI., 11 p.m.—1.30 a.m.
32.5	9230	Paris, Eiffel Tower (FL), Time Signal 3.56 a.m. and 8.56 p.m.
32	9375	Berne (Switzerland) EH90C.
32	9375	San Lazaro (Mexico) XDA, 20 kW, 9 p.m.
31.51	9520	Lynghby (Denmark) OXY, 0.5 kW. Relays Copenhagen, Daily 7 p.m. to close down.
31.42	9530	Schenectady N.Y. (W2XAF), 10 kW. (Aer.), Relays WGY, Daily from 10.30 p.m. to 4 a.m. Advance Programme for W2XAF and W2XAD in morse, daily at 10.30 p.m.
31.38	9560	Zeesen (Germany), 8 kW. Relays Königs Wusterhausen, generally 1 p.m.—12.30 a.m.
31.35	9569	Springfield (Mass.) W1XAZ, 8-10 p.m.
31.4	9554	Manila K1XR, Relays KZRM.
31.28	9590	Eindhoven (Holland) PCJ, 25 kW. WED., 5-9 p.m. THURS., 7-9 p.m., 11-12 p.m. (fortnightly), 12 midnight-1 a.m. FRI., 1-4 a.m. 7-9 p.m. SAT., 1 a.m.—2 a.m. 2-5 a.m. 8-7 a.m.
31.28	9590	Philadelphia (Pa.) W2XAU, 0.5 kW. Daily (except THURS. and FRI.), 9 p.m.—6 a.m.
31.28	9590	Sydney VK2ME.
31.25	9600	Bergen LGN.
30.75	9756	Agon, TUES. and FRI., 9-10.15 p.m.
30.88	9715	Heredia (Costa Rica) NRH, 7.5 watts. Daily, 10-11 p.m. and 2-3 a.m.
30.5	9836	Poznań (Poland), 0.25 kW. TUES., 6.45-9.45 p.m. THURS., 6.30 p.m.—1 a.m.
30	10,000	Belgrade, MON. only, 8-9 p.m.
29.5	10,167	Bangkok (Siam) HS2PJ, 0.5 kW., MON., WED. and SAT., 1-4 a.m.
28.93	10,350	Buenos Aires, LSX, 4 kW. (Testing).
26.1	11,495	Manila K1XR, Relays KZRM.
25.6	11,718	Winnipeg (Canada) CJRX, 2 kW. Daily (except SUN.) from 11.30 p.m.—1.30 a.m.
25.53	11,751	Chelmsford (G5SW), 10 kW. (Aer.), Relays G5XX daily (except SAT. and SUN.) from 12.30-1.30 p.m., and from 7 p.m.—12 m't. Except News Bulletin.
25.42	11,800	Vienna, 0.24 kW. TUES., 2-4 p.m.; WED., 10 p.m.—12 m't.; THURS., 10 a.m.—12 noon.
25.25	11,880	Pittsburgh East (W8XK), 5 p.m.—3 a.m.
24.5	12,240	Manila (Philippine Islands) K1XR, Relays KZRM, Weekdays, 10 a.m.—2 p.m.
21.5	13,950	Bucharest (Romania), 0.25 kW. WED. and SAT., 7-10 p.m.
21.3	14,080	San Lazaro (Mexico), Daily at 4 p.m. News.
21	14,283	Rabat (Radio Maroc), (Relays main station.)
19.72	15,210	Pittsburgh East (W8XK), Relays KDKA, WED. and SAT., 1-5 p.m.
19.56	15,340	Schenectady (W2XAD), 20 kW. Relays WGY, Daily (except SAT.), 6-8 p.m.
16.9	17,750	Bangkok (Siam) HS2PJ, 20 kW. 12.30-2.30 p.m. SUN. only.
16.3	17,850	Bandoeng (Java) PLF, 30 kW.
16.3	18,404	Kootwyk (Holland), PCK, From 7 a.m.
16	18,750	San Lazaro (Mexico) XDA, 20 kW. 4 p.m.
15.94	18,818	Bandoeng (PLE), TUES., 1.40-3.40 p.m.
15.5	19,351	Nancy (France), 9-10 p.m.
15.02	19,937	Buenos Aires (Monte Grande) LSG.

For Long and Medium Wave Stations see p. 748.

Last Week's Log

(October 26 to November 1)
By "NORTHERNER"

WE are now approaching the best period of what may be called the etherial "season," and the favourable reception now obtained from many of the more distant Continental stations certainly bears out this fact. While few new stations have appeared in my log for the week between October 26 and November 1, those received have been more consistent in strength from day to day than during past periods, and atmospheric were only slight on most evenings, with, perhaps, the exception of the Saturday, when they were rather troublesome on the long-wave band.

Little comment is necessary upon reception of the long-wave transmitters, and Radio-Paris, Zeesen, Motala, and Kalundborg were all at excellent loud speaker strength, while Oslo now appears to be quite settled on his new wavelength, and is being heard very well. Huizen I find rather weak, and Leningrad, though usually a good signal, seldom, if ever, offers pleasurable reception on 1,000 metres owing to the morse interference mentioned in a previous report.

The portable set user will now be experiencing greatly improved conditions, for distant reception and the long evenings will afford ample opportunity to add several new stations to the list of programmes heard.

On the medium-wave band Stockholm has shown considerable improvement, and reception has, on most occasions, been excellent, with an entire absence of the abnormal variations in strength which so completely spoil results some weeks back, while Rome has lacked none of the usually splendid volume during the week.

Budapest can now be relied upon to provide a good signal, and has been well received each evening, but Vienna has offered a variable reception, being for the most part much below normal and always accompanied by fading. Riga, after his recent return to form, has been disappointing, and little was heard of him on any evening. Milan, although still a little below par, has provided a good, steady signal, and Prague has been heard at very good loud speaker strength, particularly on the nights of the 30th and the 31st. Langenberg has appeared in the log each evening at excellent strength, but is seldom at his best until about 9 p.m.; a strong heterodyne, by the way, was noted on the 29th.

Katowice shows little change, and generally provides good reception, while Barcelona has given a much better result than for some time, and was very powerful on the evening of the 31st. Lyons exceeded all previous records for strength on the night of the 31st, and although the heterodyning continues it was not sufficiently pronounced to spoil reception on that occasion, and quality too was excellent.

Toulouse is now probably as well received as any Continental station, and has been most reliable at all times during evening reception. Hamburg was a splendid alternative during the week, but Frankfurt has varied considerably on any one evening, making reception difficult and without pleasure. Hilversum is usually to be heard at very good strength, but my log shows constant change, and fading has on occasion been very marked. Turin gave splendid loud speaker results on several evenings, while Graz has been quite up to form. Brno, Bratislava, and Leipzig were also well received towards the end of the week, and Cork has given a very powerful signal on several evenings. Dublin has been only moderate, and the heterodyne interference continues.

Like my colleague, "The Searcher," I must again comment upon the annoying heterodynes, which seem to grow commoner as the winter evenings approach. I have, during the week

under review, used no fewer than five different types of receivers, but even with the most selective this form of interference is of course still present.

WHICH STATION WAS THAT?

(Continued from page 726)

regret that your details are too vague to identify transmission some indication of WL must be given. **DYOLL (Antwerp)**: (91) this was London Regional; interval item whilst waiting for news bulletin; (92) apparently an altered programme; cannot trace. **MENTON (Heston)**: Lahti relaying Helsinki. **FIBRE BILL (Penge)**: Flensburg relaying early morning gramophone concert from Hamburg. **B.M/VVXH (N.F.)**: Kharkov on 938 m. **DINKUM AUSSIE (Acton)**: Radio-Idzderia, The Hague; **SEARCHER (Gorton)**: Algiers. **MINER (Waf ebie)**: Apparently a relay, but we cannot trace the transmitter. **AUDITEUR (Liverpool)**: Trans-Atlantic telephony; may we remind you of the conditions of your listening licence? **GARTH MOORE (Bradford)**: Radio Normandie (Fécamp); a sponsored concert. **HILBEX (Ipswich)**: Turin is now on 206.2 m. **CYMR0 (Llanrug)**: Cannot trace; your details are too vague; some estimate of WL must be given. **H. V. T. (Coltingham)**: Radio Maroc (Rabat); gram. records. **COVER POINT (Manchester)**: Moscow (Trades' Unions); an international evening. **J. A. P. (Sandhurst)**: Apparently London National relayed by Stockholm and heard through Hörby. The violin and piano recital tallies with the latter's programme. **O. L. (Birchwood)**: Possibly Nice—Juan-les-Pins; details of programme were not published. **GWYDDOR (Maesteg)**: Apparently Breslau; altered programme, as the last broadcast advertised was dance music. **DINGLE WAY (West Row)**: No coupons were enclosed; on must be sent with each inquiry. Your condenser readings on "short waves" appear to be wrong, for if Copenhagen is on 20 degrees, London National cannot be on 80 degrees. We cannot trace transmissions from the information given. With regard to postscript, write to Nederlandsche Christelijke Radio Vereeniging, Huizen (Holland). **P. V. (Worcester)**: Königs Wusterhausen; a relay of concert by the Berlin Symphony Orchestra. Apparently an altered item in the programme. **WATERLOO (Cardiff)**: Turin on its new wavelength. **ISLASIDE (Keith)**: Experiments in relays are being carried out at irregular intervals by Vienna; possibly an attempt to relay the London broadcast of the Savoy Hotel speeches. **NOVARENSIAN (Newark)**: PTT Strasbourg testing; announcements and call in both French and German. **INQUIRER (Halifax)**: Katowice; answers to foreign correspondents by microphone; (2) from about 11 a.m. every Sunday morning. **MAGNET (Glasgow)**: Turin (see Wavelength List). **THRUMS (Kirriemuir)**: No, this was Katowice; see reply to **INQUIRER (Halifax)** above. **SCREENED GRID THREE (Amersham)**: See previous reply. The call was "Ici Radio Pologne, Katowice." **TINKER (Leeds)**: Langenberg relaying Savoy Hotel speeches (Prof. Einstein and Mr. G. B. Shaw). **J. T. S. (Portsmouth)**: Algiers. **WOODLEE (Harrogate)**: Not advertised in any European programme; possibly an American broadcast—say, from WJIC, Hartford, Conn., which would tally with wavelength. **MUDDLER (Budeigh Salterton)**: Langenberg relaying Cologne; altered item in programme. **ETHER (Wolverhampton)**: Lucia. **STUMPED (Harrow)**: Stockholm: the singer was Madame Charles Cahier. **LONG WAVE (Totton)**: Eiffel Tower; own broadcast of gram. records. **SPECTACLES (Bristol)**: Ljubljana; a relay of dance music from the Auto Club, Belgrade. **DESDON (Eastleigh)**: Oslo; dance music (gram. records). **COOK (Washington, co. Durham)**: This was a relay by Langenberg. **ASOR (S.E.25)**: **WAVELENGTH (Gt. Kendall)**: **HACRO (Glasgow)**: **GUGLIEMO (Leeds)**: **ROLLER (Chester)**: We have no definite information regarding this broadcast, which appears to have been picked up by a number of listeners. One correspondent states that he heard the call letters KPCG, Los Angeles or San Francisco, but we cannot trace it. Possibly relayed by a Continental station. **PEG (New Quay)**: **T. O. (Glasgow)**: Katowice; letter box. The French call heard was "Radio Pologne, Katowice." See reply to **INQUIRER (Halifax)**. **ALL NIGHT FOREIGN FAN (N.17)**: Moscow Komintern; early morning physical exercises. Eastern European time is two hours in advance of G.M.T. **ROVER (Coventry)**: We cannot estimate wavelength from the details you give; the figures stated are not metres or frequencies, but degrees on the condenser dial. Without some estimate of wavelength we cannot trace transmission. **ACME (Manchester)**: San Sebastian (EAJ 8) relaying gramophone records from Madrid (EAJ 7). **MURRAY TOM (Sheffield)**: Turin on its new wavelength. **K. S. O. (S.W.17)**: We cannot trace morse transmitters in these columns. **J. L. C. (Leytonstone)**: Dublin; children's hour. **BUSSER (Walsall)**: Huizen; gramophone records. **WORLD PROWLER (Geogness)**: If you are sure of the call, Rome direct, but that station advertised a relay of an operatic performance; on the other hand, Belgrade (also a lady announcer) broadcast Spanish dance music at that time. Of course, the Rome performance may have been cancelled. **BRUSHER (St. Leonards-on-Sea)**: This was Eiffel Tower; own concert followed by relay from Coliseum, Paris. **JAYDEE (Gateshead)**: Munich; night concert (Bach); organ and choir. **S. G. 3 (Bromley)**: Moravska-Ostava (gram. records). **CENTER TAP (Glanamman)**: Nürnberg relaying Munich; you heard the latter's interval signal. **CAULDCOTE (N.W.4)**: Cannot trace from your condenser readings; some estimate of wavelength must be submitted. **COULIN MOTH (Timoleague, co. Cork)**: Moscow (Trades' Unions). **ARIEL (Newark)**: Regret, cannot trace. Are you sure this was not G5SW, Chelmsford, which took the relay?

LIGHTS AND SHADOWS

(Continued from page 717)

Yielding to the fond wish of the good people of Paris, Costes and Bellonte stepped on to the balcony. An immense cheer arose, swelling like a powerful wave, and telling of the proud gratification of a whole nation.

I tuned in again to Langenberg. . . . Silence

LOUIS QUIÉVREUX.

Which Station Was That?

Answers to Correspondents.

CON (Stokefleming): The item heard was a gramophone record (e.g. military tattoo), in which chimes and striking of Big Ben are included. We cannot understand your wavelength, i.e. "550 other 1900," but according to programme at that time Motala relayed gramophone records from Stockholm. **PART (Edgbaston)**: Not Radio Stamboul, but Strasbourg. The new PTT station testing; French and German announcements. **GUGLIEMO (Headingley)**: (1) no, this was Hörby relaying General Election results from Stockholm; (2) possibly Croydon comparing wavelengths with French aerodrome (900 m.); this is done daily. **K. G. P. (Hadley, Salop)**: Yes, apparently W8XK E. Pittsburg relaying KDKA; (2) advise you to write to Radio Society of Great Britain, 53, Victoria Street, London, S.W.1. **A. C. H. (E. 14)**: Bucharest. Outside broadcasts are seldom advertised in programmes. **A. Y. Z. (Great Yarmouth)**: Augsburg; relay of the Munich symphony concert. **HAGO (Manchester)**: Riga. **CARLTON (Sefton Park, Liverpool)**: Most Continental stations were giving dance music at that time; possibly Schaerbeek (Brussels). **MOORE (Tonbridge)**: Eiffel Tower; broadcast of gramophone records. **EFISHER (Clacton)**: Croydon aerodrome calling Belgian airplane. **WIRELESS ENTHUSIAST (Birmingham)**: (1) Algiers; (4) yes, Radio Strasbourg testing; formal opening on November 11 next; (2) Radio Maroc (Rabat); (3) Marseilles. **LA KYRIELLE (Bournemouth)**: (1) cannot understand your estimated wavelength; if Oslo is on 50° (1,071 m.), 1,000 metres could not be on 13°; (2) Kharkov on 938 m.; (3) Fécamp (Radio Normandie); (4) Moscow (Trades Unions). **MIKI (Bristol)**: (1) yes, WABC, Essex County, N.J. (U.S.A.); (2) cannot trace definitely; only station on that WL is WSB (Atlanta, Ga). **MEDIUM WAVE (Bristol)**: (1) Bremen relaying Hamburg; (2) Poznań. **MALT (Sevenoaks)**: San Sebastian (E.A.8) relaying Madrid. **FORESTER (Guernsey, C.I.)**: Radio Maroc (Rabat). You probably misunderstood the call as regards WL; surely "Quatre-cent-seize, virgule [.] quatre metres." **VELOCITAS (Wallasey)**: **DEXTERITY (South Shields)**; **NOSEY (Peasehaven)**; **RED DRAGON (Newton)**; **D.X. (Glasgow)**: Radio PTT Strasbourg, new French state transmitter, testing. **WADIA (Bombay)**: Apparently W2XAF, relaying WGY, Schenectady, N.Y. (U.S.A.); (2) Stamboul or Ankara; Oriental concerts are broadcast at that time. **E. G. D. (London)**: Rabat (Morocco) working with Ste Assise (France). **BEAUFORT (Bath)**: Bucharest. **ELEVE (Littlehampton)**: (1) CTIAA, Lisbon (Portugal); was on 45 m.; possibly wavelength has been slightly altered; (2) cannot confirm, possibly W0XAL, Westminster, Cal. (U.S.A.). **HOLLAND (E.12)**: Dutch amateur experimental transmitter at Utrecht (Holland); sometimes relays A.V.R.O. programmes from Hilversum. **SELKIRK (Bradford)**: Tallies with Warsaw programme. **EARLY BIRD (Salford)**: Kiel; relay of early gramophone broadcast from Hamburg. **LIZ (Holborn)**: You hear the combined transmissions, but possibly from Bournemouth as this is the most powerful of the relay stations. **REDHEAD (Swansea)**: Write to Broadcasting Station VRY, Georgetown, British Guiana. **VICOT (East Cowes)**: Apparently harmonic of Radio Toulouse, with which the programme partly tallies. **R. B. L. (Hawick)**: (1) no time stated, so cannot trace; presume 230 metres, not ke's if close to Nürnberg; it was not the latter station; (2) a pick-up

on your set of the Midland Regional transmission, at the bottom of your long-wave coil; (3) yes, back on its old wavelength. **MIKE (Margate)**: (1) very vague, but might tally with Brussels No. 2; (2) Turin. **PILLS (Blundellsands)**: Eiffel Tower, (Paris). **SEARCHER 2 (Poplar)**: Nürnberg relaying from the Café Luitpold, Munich. **STREETS (Bulford)**: Not advertised, but apparently Bucharest. **TUBS (Princes Risborough)**: Eiffel Tower. **NIL DESPERANDUM**: Bremen relaying Hamburg; imitation American cabaret. **ONE ONE SEVEN (Hull)**: This transmission was reported by many listeners, but we possess no definite information regarding the station. **MAYWOOD (Bournemouth)**: Could be only Kiev on that wavelength; (2) Moscow (Trades Unions); (3) Radio-Normandie (Fécamp). **C. G. J. (Portsmouth)**: **GARÇON (Bridgewater)**; **YELDUD (Portsmouth)**; **UNLUCKY (Battersea)**; **THREE VALVER (Manchester)**; **WICK (Devizes)**: The station appears to have returned to its old wavelength. **MILO (Worthing)**: Radio-Normandie (Fécamp); a relay of the reception given to the French aviators (Costes and Bellonte) on their arrival at Havre from U.S.A. **PUZZLED (Uxbridge)**: Eiffel Tower; a relay of PTT, Paris. As you do not state date we cannot give you the further information desired. **MOI-MEME (Brentford)**: Apparently altered Stockholm programme (via Hörby). **RADNOR**: Trans-Atlantic telephony. **ROSSO (Rathnagly)**: Radio-Idzerda, The Hague. **SPIDER (Burnham)**: Moscow Komintern; early morning physical exercises. Eastern European time is two hours in advance of G.M.T. **GOLDLOCKS (Streatam)**: (1) British experimental amateur transmitter; write to Radio Society of Great Britain, 53, Victoria Street, London, S.W.1; (2) cannot trace, but most certainly not Japanese. According to call, this would have been a German station. **HAPPY (Greenock)**: Experimental television transmission by the Baird process (sound on London National wavelength). **YOUNG INQUIRER (Liverpool)**: (1) possibly a German experimental transmission; (2) surely 3RO, Rome; (3) we do not know definitely, but believe about 300 watts. **NIPPY (Glasgow)**: Regret, cannot trace. We do not know of a transmission on 1,022 metres actual. **NIGHT HAWK (Barnes)**: (1) Lyon-la-Doua; (2) Moscow (Trades Unions); broadcasts in French, German, etc. **SEDAN (Barnes)**: Surely a test by Radio Toulouse; there is no other French transmitter near that WL. **EXPLORER (Poplar)**: (1) Radio-Idzerda, The Hague, Holland; gram. records; (2) W2XAF, relay of WGY, Schenectady. **REGENA (New Barking)**: Regret, cannot trace any transmission on that WL at that time; possibly a test. **ELECTRIC (Tolworth)**: **DOUGLAS (Leicester)**: Apparently an alteration in the Stockholm programme; received via Hörby. The item was not advertised. **U.S. LISTENER (Striplay)**: We do not know the call letters KBRM. Are you sure this was not KZ (zee) RM, Manila, with which WL almost tallies? **NIGHT HAWK (Dover)**: Please number your queries. (1) CTIAA, Lisbon on 43 m.; (2) possibly Rome (3RO); (3) W2XE, relaying WABC, Richmond Hill; (4) surely W2XAF, relaying WGY, Schenectady. **FIN (Cardiff)**: Kosice; relay of a play. **ROMAINE**: (1) one of the Swedish relays; the broadcast was followed by a choral concert from Stockholm; (2) according to programme, Béziers; (3) yes, Lyon-la-Doua; (4) Moravská-Ostrava relaying performance of *Prince Igor*. **J. T. (S.E.5)**: Nürnberg relaying Munich. **RASTUS (Pontypriid)**: Bordeaux-Lafayette; relay of a play from (PTT) Paris. **A.B.G. (Newcastle-on-Tyne)**: Please number your queries. (1) Hörby relaying English lesson from Stockholm; (2) Langenberg; relay of concert. **R. von E. (Oxford)**: We

(Continued on column 3, page 725)

The Alternative Postal Service

In addition to the free service of "Which Station was That?" printed in these columns, replies to queries can be obtained within forty-eight hours of receipt of details on payment of 6d. in stamps or P.O., accompanied by coupon and stamped addressed envelope. Each query should be numbered and the questions on the coupon carefully answered. Letters must be addressed to the Editor, *World-Radio*, Savoy Hill, W.C.2. Envelopes (containing *paid postal queries* only) to be marked in left-hand top corner "Postal Query Service."

IDENTIFICATION COUPON (No. 94.)

This coupon is valid for ONE QUESTION only, and should be cut out and attached to a separate sheet, upon which the following questions should be answered in the order shown. No coupon more than one month old is valid.

1. Time and Date of reception.
2. Approximate frequency in kilocycles per sec. (or wavelength in metres).
3. Nearest known stations, above and below.
4. Call or interval signal, if heard.
5. Language.
6. Type of receiver in use and strength of signal.
7. Details of programme or signal received.
8. Name and address.
9. Nom de plume. (*Proprietary names must not be used.*)

Schedule of Advance Programmes

(STRICTLY COPYRIGHT)

For the benefit of traders who may wish to make arrangements for demonstrating, we are printing each week a schedule of the programmes to be transmitted by the National, London Regional, and Midland Regional stations. It will be noticed that these schedules concern programmes to be transmitted a fortnight hence, and it is felt that they will also be of particular service to those of our readers living abroad who will be able to use them in connection with the reception of the Experimental Short Wave Station G5SW, which relays the National (5XX) Programme from 7 p.m.

SUNDAY, NOVEMBER 23

	NATIONAL	LONDON REGIONAL	MIDLAND REGIONAL
AFTERNOON	Church Cantata St. Cecilia's Day Programme	Military Band	Studio Orchestra
EVENING PROGRAMME	Hotel Orchestra	Symphony Concert	As London Regional

MONDAY, NOVEMBER 24

	NATIONAL	LONDON REGIONAL	MIDLAND REGIONAL
MORNING	Organ Recital	Ballad Concert	As London Regional
AFTERNOON	Orchestral Concert Dance Music Studio Concert	Restaurant Music As Midland Regional	As London Regional Cinema Orchestra
FIRST EVENING PROGRAMME	Talk Vaudeville	Light Orch. Concert French Talk	Band Concert As London Regional
SECOND EVENING PROGRAMME	Talk Chamber Music Outside Dance Music	Orchestral Concert Dance Music	As London Regional As London Regional (till 11 p.m.)

TUESDAY, NOVEMBER 25

	NATIONAL	LONDON REGIONAL	MIDLAND REGIONAL
MORNING	Ballad Concert Cinema Organ	Instrumental Music Organ Recital	As London Regional Cinema Organ
AFTERNOON	Restaurant Music Talks	As Midland Regional	Studio Orchestra
FIRST EVENING PROGRAMME	Talks Light Music	Brass Band Mus. Comedy Programme	Studio Orchestra As London Regional
SECOND EVENING PROGRAMME	Talk Outside Dance Music	Play Outside Dance Music	As London Regional As London Regional (till 11 p.m.)

WEDNESDAY, NOVEMBER 26

	NATIONAL	LONDON REGIONAL	MIDLAND REGIONAL
MORNING	Gramophone Records	Organ Recital Gramophone Records	As London Regional As London Regional
AFTERNOON	Restaurant Music Symphony Concert	As Midland Regional As National	Studio Orchestra
FIRST EVENING PROGRAMME	Talks Symphony Con. (Pt. 1)	Vaudeville German Talk	As London Regional As London Regional
SECOND EVENING PROGRAMME	Symphony Con. (Pt. 2) Outside Dance Music	Light Music Outside Dance Music	Military Band As London Regional (till 11 p.m.)

THURSDAY, NOVEMBER 27

	NATIONAL	LONDON REGIONAL	MIDLAND REGIONAL
MORNING	Studio Concert Organ Recital	Cinema Orchestra	As London Regional
AFTERNOON	Abbey Evensong Restaurant Music	As Midland Regional	Orchestral Concert
FIRST EVENING PROGRAMME	Talks Play	Talk Light Music	As London Regional Light Music
SECOND EVENING PROGRAMME	Military Band Studio Dance Music	Orchestral Studio Dance Music	Vaudeville As London Regional (till 11 p.m.)

FRIDAY, NOVEMBER 28

	NATIONAL	LONDON REGIONAL	MIDLAND REGIONAL
MORNING	Sonata Recital Organ Recital	As Midland Regional	Studio Orchestra
AFTERNOON	Gramophone Records Talks Hotel Orchestra	Restaurant Music As Midland Regional As National	As London Regional Dance Music
FIRST EVENING PROGRAMME	Talks Vaudeville	Gramophone Records Light Music	Military Band Chamber Music
SECOND EVENING PROGRAMME	Talk String Orchestra Outside Dance Music	Light Orch. Concert Outside Dance Music	As London Regional As London Regional (till 11 p.m.)

SATURDAY, NOVEMBER 29

	NATIONAL	LONDON REGIONAL	MIDLAND REGIONAL
MORNING	Cinema Orchestra	As National	
AFTERNOON	Band Concert Cinema Organ	Opera	Outside Broadcast
FIRST EVENING PROGRAMME	Talks Orchestral Concert	Military Band	Studio Orchestra
SECOND EVENING PROGRAMME	Talk Diversions Outside Dance Music	As National Chamber Music Outside Dance Music	As National Studio Orchestra As London Regional (till 11 p.m.)

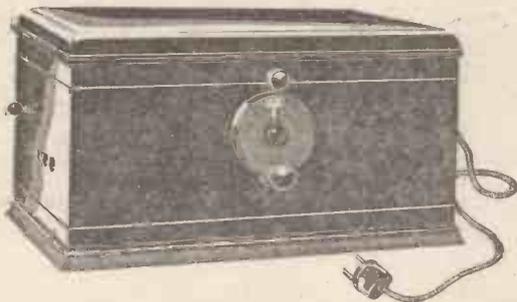
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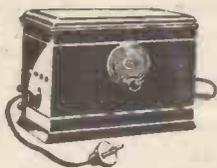
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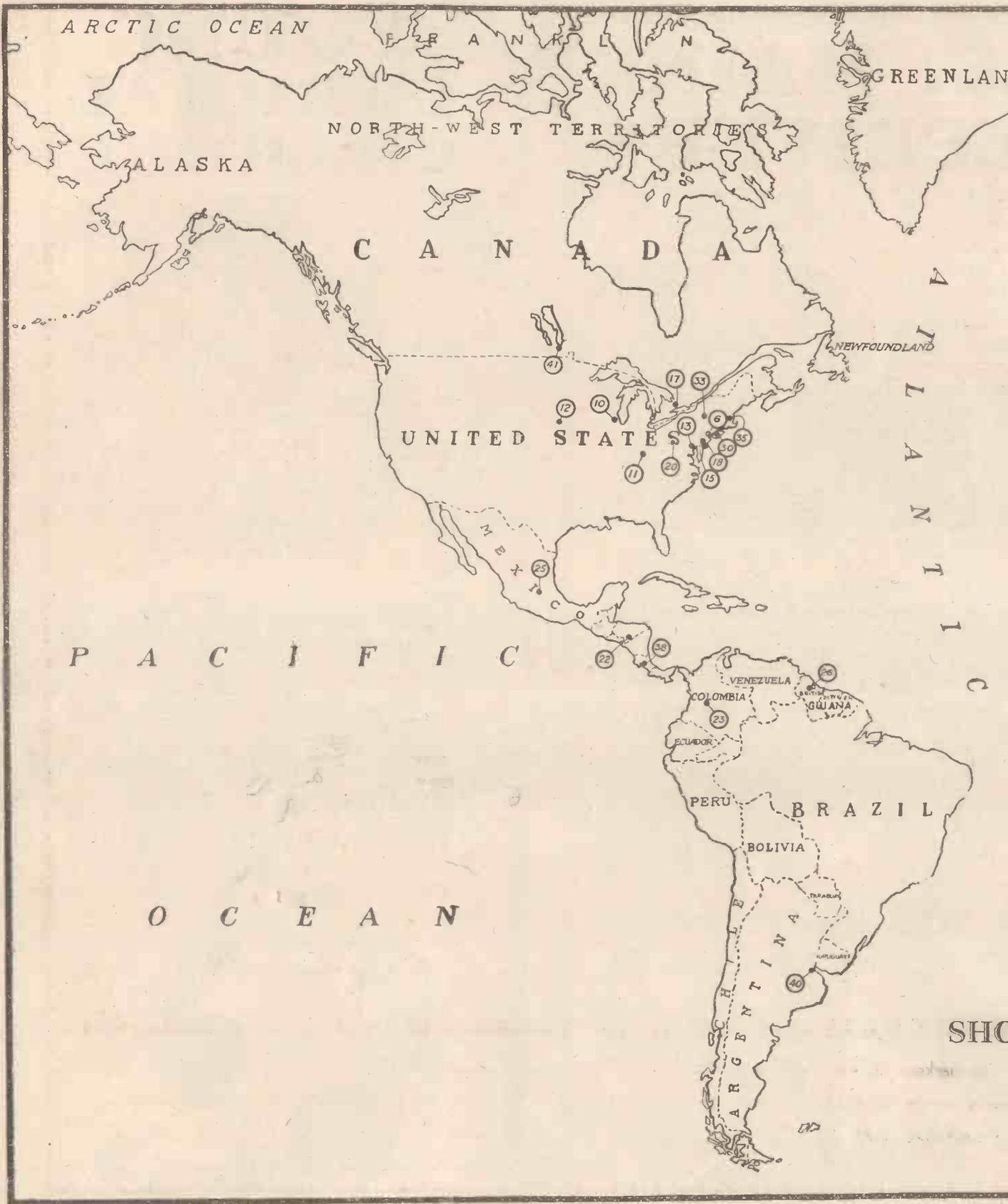
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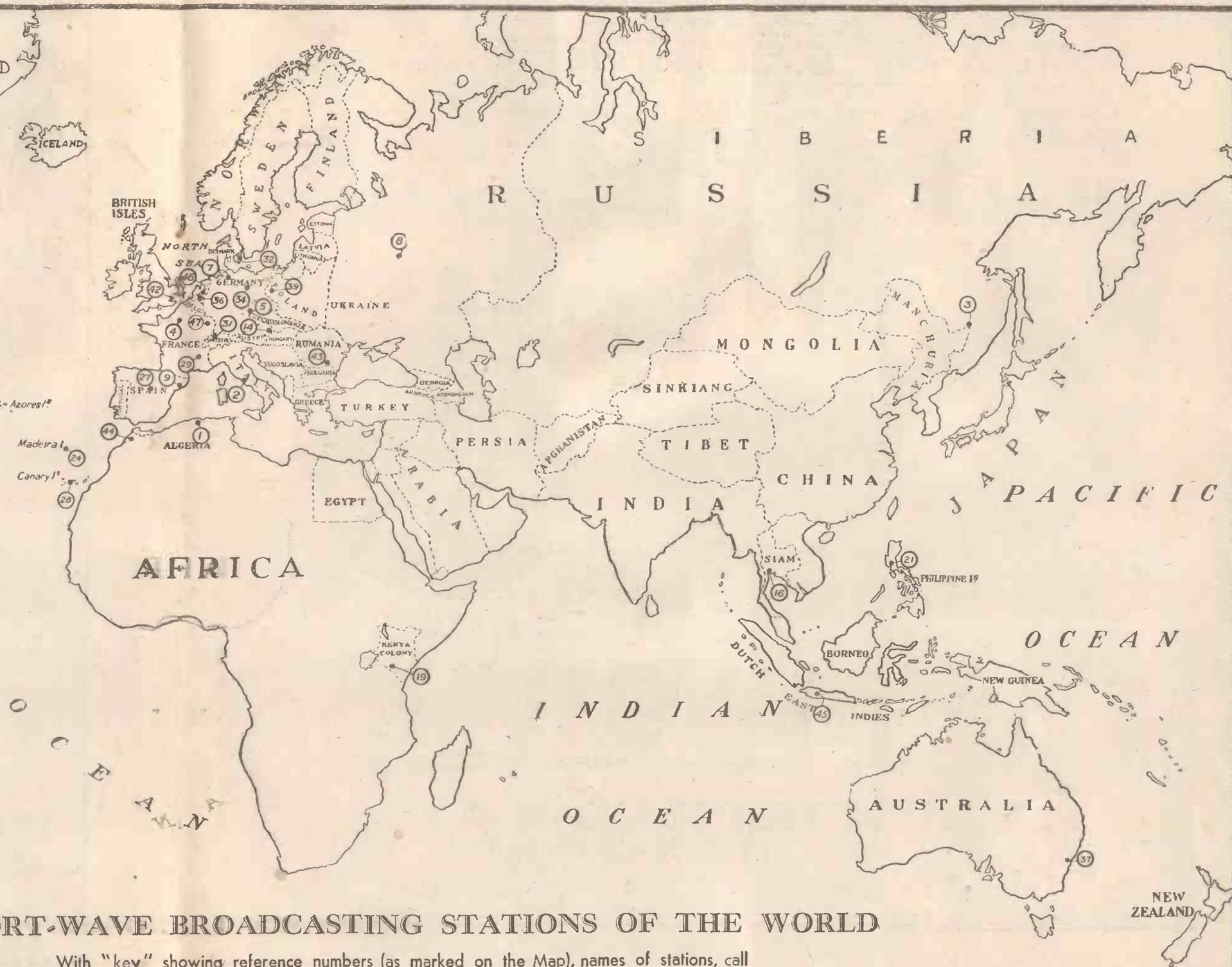
BRITISH SUPERSENSITIVE TELEPHONES.



Ref.	Station	Call	M.	kW.
1	Constantine (Algeria) ..	8KR	80	—
2	Rome (Italy)	3RO	80	9
3	Kharbarovsk (Russia) ..	—	70.1	—
4	Radio LL (France)	—	61	0.5
4	Radio Vitus (France) ..	—	41	—
4	Eiffel Tower (France) ..	FL	32.5	—
5	Prague (Czechoslovakia) ..	OK1MPT	58	—
6	New York City (U.S.A.) ..	W2XBH	54.02	—
6	New York (U.S.A.) ..	W2XBR	49.83	1
6	New York (U.S.A.) ..	W2XAL	49.67	0.25

Ref.	Station	Call	M.	kW.
6	Richmond Hill	W2XE	49.02	0.3
7	Bergedorf (Germany) ..	AFL	52	3
8	Moscow (Russia)	—	50	—
9	Barcelona Radio Club (Spain) ..	EAJ25	50	—
10	Chicago (U.S.A.)	W9XF	49.83	5
10	Chicago (U.S.A.)	W9XAA	49.34	0.5
11	Cincinnati (U.S.A.)	W8XAL	49.5	—
12	Council Bluffs (U.S.A.) ..	W9XU	49.5	0.5
13	Philadelphia (U.S.A.) ..	W3XAU	40.5	0.5
13	Philadelphia (U.S.A.) ..	W8XAU	31.28	0.5

Ref.	Station	Call	M.	kW.
14	Vienna (Austria)	—	49.4	0.4
14	Vienna (Austria)	—	25.42	0.24
15	Newark (U.S.A.)	W2XCX	49.34	—
16	Bangkok (Siam)	HS2FJ	49.3	—
16	Bangkok (Siam)	HS2PJ	29.5	0.5
16	Bangkok (Siam)	HS1PJ	16.9	20
17	Toronto (Canada)	VE9GW	49.22	0.015
18	Bound Brook (U.S.A.) ..	W8XAL	49.18	12
19	Nairobi (Kenya)	7LO	49	—
20	Pittsburgh East (U.S.A.) ..	W8XK	48.80	—
20	Pittsburgh East (U.S.A.) ..	W8XK	25.25	—



SHORT-WAVE BROADCASTING STATIONS OF THE WORLD

With "key" showing reference numbers (as marked on the Map), names of stations, call letters, wavelengths in metres (M), and aerial power (kW), in accordance with "World-Radio" Short-Wave List.

From World Sketch Map by Edward Stanford, Ltd., 12-14, Long Acre, London, W.C.2.

Ref.	Station	Call	M.	kW.
20	Pittsburgh East (U.S.A.)	W8XK	19.72	—
21	Manila (Philippine Islands)	KZRM	48.8	—
21	Manila (Philippine Islands)	KA1XR	31.4	—
21	Manila (Philippine Islands)	K1XR	26.1	—
21	Manila (Philippine Islands)	K1XR	24.5	—
22	Teguicigalpa (Honduras)	HRB	48.62	2.5
23	Bogotá (Colombia)	HKC	48.35	—

Ref.	Station	Call	M.	kW.
23	Bogotá (Colombia)	HKF	39.7	—
24	Funchal (Madeira)	CT8AG	47	—
25	San Lazaro (Mexico)	XDA	44	3
25	San Lazaro (Mexico)	XDA	32	20
25	San Lazaro (Mexico)	XDA	21.3	—
25	San Lazaro (Mexico)	XDA	16	20
26	Georgetown (British Guiana)	VRY	43.86	0.12
27	Madrid (Spain)	EAR110	43	—
28	Tenerife Radio Club (Canary Islands)	EAR58	41.6	0.05

Ref.	Station	Call	M.	kW.
29	Lyons (France)	YR	40.2	—
30	Long Island (U.S.A.)	W2XV	34.68	—
31	Berne (Switzerland)	EH90C	32	—
32	Lyngby (Denmark)	OXY	31.51	0.5
33	Schenectady (U.S.A.)	W2XAF	31.48	10
33	Schenectady (U.S.A.)	W2XAD	19.56	20
34	Zeesen (Germany)	—	31.38	8
35	Springfield (U.S.A.)	W1XAZ	31.35	—
36	Eindhoven (Holland)	PCJ	31.28	25
37	Sydney (Australia)	VK2ME	31.28	—
38	Heredia (Costa Rica)	NRH	30.88	0.00

Ref.	Station	Call	M.	kW.
39	Poznań (Poland)	—	30.5	0.25
40	Buenos Aires (Argentina)	LSX	28.98	4
41	Winnipeg (Canada)	CJRK	25.8	2
42	Chelmsford (England)	G5SW	25.53	10
43	Bucharest (Romania)	—	21.5	0.25
44	Rabat (Radio Maroc) (Morocco)	—	21	—
45	Bandoeng (Java)	PLF	16.8	30
45	Bandoeng (Java)	PLE	15.94	—
46	Kootwyk (Holland)	PCK	16.3	—
47	Nancy (France)	—	15.5	—

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Daventry 5XX

NATIONAL PROGRAMME

193 kc/s (1,554.4 metres) (35 kW.)

(November 9-15)

SUNDAY (NOV. 9)

10.30-10.45 a.m. (app.)—Time Signal (Greenwich). Weather Forecast. 3.0 p.m.—Church Cantata (No. 38) (Bach). Aus tiefer Noth schrei ich zu dir (Downcast and poor, I cry to Thee). Singers: Mary Hamlin (Soprano), Doris Owens (Contralto), Eric Greene (Tenor), The Wireless Chorus. Players: Michael Mullinar (Harpichord), Leslie Woodgate (Organ), The B.B.C. Orchestra (Trumpet, 3 Trombones, 2 Oboes, Strings), conducted by Stanford Robinson. 3.55 p.m. (from Cardiff)—For the Children. 4.15 p.m.—Major-General Sir Fabian Ware, K.C.V.O., K.B.E., C.B., C.M.G., LL.D., Chairman of the War Graves Committee of the Imperial Conference: "The Nations and their Common Heritage." 4.30 p.m.—The Gershwin Parkington Quintet. Risph Goodacre (Contralto). 5.45-6.15 p.m.—"Science and Religion"—VII. The Rev. Canon B. H. Streeter, D.D. 7.55 p.m.—St. Martin-in-the-Fields. Address, The Rev. W. Russell Maltby, D.D. 8.45 p.m.—The Week's Good Cause. Appeal on behalf of The British Legion by Admiral of the Fleet, Earl Jellicoe, G.C.B., G.C.V.O. 8.50 p.m.—"The News." Weather Forecast, General News Bulletin; Shipping Forecast. 9.5 p.m.—Tom Jones and the Grand Hotel, Eastbourne, Orchestra, from the Grand Hotel, Eastbourne. Olive Groves (Soprano). 10.30 p.m.—Epilogue. 10.40-11.0 p.m.—The Silent Fellowship.

7.45 p.m.—H.R.H. The Prince of Wales: "Poppy Day." 8.0 p.m.—"Brigade Exchange." A Sound Picture by Ernst Johannsen. Based on the novel "Four Infantrymen on the Western Front." English version made by I. D. Benzie and Dulcima Glasby. 9.0 p.m.—Speech by the Prime Minister, The Rt. Hon. J. Ramsay MacDonald, following the Lord Mayor's Banquet, relayed from The Guildhall. 9.20 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 9.45 p.m.—"The Future of Medicine."—IV. Professor Sidney Russ, D.Sc., Professor of Physics, Medical School, Middlesex Hospital: "Radiology." 10.5 p.m.—Shipping Forecast; New York Stock Market Report. 10.10 p.m.—The Victor Olof Sextet. Eveline Stevenson (Soprano). 11.0 p.m.—12 midnight.—Dance Music.

TUESDAY (11)

10.15 a.m.—Weather Forecast. 10.30 a.m.—Time Signal (Greenwich). 10.30-11.0 a.m.—Cenotaph Service. Relayed from Whitehall. 12 noon—Victorian Ballad Composers—IV. Alexander Carey (Contralto), Rene Soames (Tenor). 12.30 p.m.—Edward O'Henry at the organ. 1.0 p.m.—Light Music. Leonardo Kemp and his Piccadilly Orchestra. 2.0 p.m.—Experimental Transmission for the Radio Research Board by the Fultograph Process. 2.5 p.m.—East Anglian Herring Fishing Bulletin. 2.10 p.m.—For the Schools. Mr. Eric Parker: "Out of Doors Week by Week—VII. Rain and Floods: Erosion and Accretion in Landscape." 2.25 p.m.—Interlude. 2.30 p.m.—Sir Walford Davies: "Music—VIII. Reading a Rhythm at Sight." 3.30 p.m.—Interlude. 3.35 p.m.—Monsieur E. M. Stéphan: Early Stages in French—VIII. 4.0 p.m.—Interlude. 4.5 p.m.—Special Talk for Secondary Schools: "Modern Scientific Achievements"—IV. Dr. Franklin Kidd: "Cold Storage of Fruit." 4.25 p.m.—Interlude. 4.30 p.m.—The Prince of Wales Orchestra, conducted by Frank Westfield. 5.15 p.m.—The Children's Hour. 6.0 p.m.—"Ixion," of The Motor Cycle: "The 1930 Cycle and Motor Cycle Show." 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin. 6.35 p.m.—London Stock Exchange Report; Fat Stock Prices for Farmers. 6.40 p.m.—The Foundations of Music. Mozart Quartets. Played by The International Spring Quartet. 7.0-7.20 p.m.—"The Month in Scotland." Major Walter Elliot. 7.25 p.m.—"At or C3—The Future of the Race"—I. Major Leonard Darwin: "Our Nation in the Future." 7.45 p.m.—Interval. 8.0 p.m.—British Legion Festival of Remembrance. From The Albert Hall. 9.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 9.15 p.m.—Shipping Forecast; New York Stock Market Report. 9.20-10.20 p.m. (app.)—In Memoriam, 1914-1918. A Chronicle. Summer, 1914—"Now, God be thanked who has matched us with His hour." Spring, 1915—"I have a rendezvous with Death." 1916—"Where do you halt now?"

SATURDAY (15)

10.15-11.0 a.m. (London).—National Programme.

Winter, 1917—"What passing-bells for those who die as cattle." Autumn, 1918—"Lift not thy trumpet, Victory, to the sky." November 11, 1930—The Menin Gate at Ypres.

WEDNESDAY (12)

10.15 a.m.—The Daily Service. 10.30 a.m.—Time Signal (Greenwich), Weather Forecast. 10.45-11.0 a.m.—Lady Cynthia Mosley, M.P.: "The Week in Westminster." 12 noon—Speech of His Majesty the King Emperor in opening The Indian Round Table Conference, together with subsequent speeches, including that of the Prime Minister of the United Kingdom, relayed from The Royal Gallery of the House of Lords. 1.0 p.m.—Light Music. Frascati's Orchestra, directed by Georges Haeck. 2.0 p.m.—Beethoven Songs. Doris Bonsor (Soprano), William Barrand (Bass). 2.25 p.m.—Interlude. 2.30 p.m.—For the Schools—Professor Winifred Cullis, C.B.E., "Biology and Hygiene for Senior Schools—Your Body Every Day: VIII. How the Transport System is Worked—I." 2.55 p.m.—East Anglian Herring Fishing Bulletin. 3.0 p.m.—Mr. J. C. Stobart and Miss Mary Somerville: "Children in Books—VIII." 3.25 p.m.—Interlude. 3.30 p.m.—Symphony Concert. The Bournemouth Symphony Orchestra, conducted by Sir Dan Godfrey. (Soloist, Cyril Smith.) 4.45 p.m.—Reginald New at the Organ of The Beaufort Cinema. Relayed from Washwood Heath, Birmingham. 5.15 p.m.—The Children's Hour. 6.0 p.m.—Ministry of Agriculture Fortnightly Bulletin. 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin. 6.35 p.m.—London Stock Exchange Report; Fat Stock Prices for Farmers. 6.40 p.m.—The Foundations of Music. Mozart Quartets. 7.0-7.20 p.m.—"Girls and a Career Overseas"—A Dialogue between two Headmistresses (Under the Auspices of The Oversea Settlement Department). 7.25 p.m.—Industry Looks Ahead. 7.35 p.m.—Sir Josiah Stamp, G.B.E., D.Sc.: "Modern Directorship and Management"—II. 7.45 p.m.—Interval. 8.0 p.m.—B.B.C. Symphony Concert—IV. Relayed from The Queen's Hall, London. Arthur Catterall (Violin), Robert Murchie and Frank Almgill (Flutes), Alec Whittaker, J. Panting, T. McDonagh (Oboes), Richard Newton (Bassoon), Aubrey Brain-ton (Trumpet), Leon Goossens (Oboe d'Amore), Harold Samuel (Pianoforte), Keith Falkner (Bass). The B.B.C. Symphony Orchestra (Leader, Arthur Catterall). Conducted by Sir Henry Wood. 9.5 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 9.20 p.m.—Symphony Concert. Part II. 10.5 p.m.—Topical Talk. 10.20 p.m.—Shipping Forecast; New York Stock Market Report. 10.25 p.m.—12 midnight.—Dance Music.

THURSDAY (13)

10.15 a.m.—The Daily Service. 10.30 a.m.—Time Signal (Greenwich), Weather Forecast. 10.45-11.0 a.m.—"The Trials of a Family"—IX. Miss Muriel Payne; "The Ordinary Child,"—II, The Schoolchild." 12 noon.—Reginald Foort at the Organ. 1.0 p.m.—A Concert. Constance Hope (Soprano), Belle Davidson (Violin), Nancy Reed (Pianoforte). 2.0 p.m.—East Anglian Herring Fishing Bulletin. 2.10 p.m.—For the Schools. Dr. Ernst Deissmann and Dr. Heinz Walz: German Dialogue—IV. "Was gibt es heute Neues in der Zeitung?" (What is there in the Newspaper to-day?) 2.25 p.m.—Interlude. 2.30-2.45 p.m.—Mr. A. Lloyd James: "English Speech—VIII." 3.0-3.45 p.m.—Evensong. From Westminster Abbey. 4.5 p.m.—Mr. C. Armstrong Gibbs: "The Music of some Great Composers"—VIII. 4.25 p.m.—Interlude. 4.30 p.m.—Light Music. The Grosvenor House Orchestra. Directed by Joseph Meuss. 5.15 p.m.—The Children's Hour. 6.0 p.m.—A Reading by V. C. Clinton Baddeley. From "David Copperfield," by Charles Dickens. 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin. 6.30 p.m.—London Stock Exchange Report. 6.35 p.m.—Market Prices for Farmers. 6.40 p.m.—The Foundations of Music. Mozart Quartets. 7.0-7.20 p.m.—"New Novels." Mr. A. Duff Cooper. 7.25 p.m.—"What is Liberty?"—I. Professor Ernest Barker, Litt.D., LL.D., Professor of Political Science, Cambridge University. 7.45 p.m.—The Wireless Military Band. Conducted by B. Walton O'Donnell. Lila Boddam (Mezzo-Soprano), John Perry (Tenor). 9.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 9.15 p.m.—Shipping Forecast; New York Stock Market Report. 9.20 p.m.—Topical Talk. 9.40 p.m.—"Give Me New York." Book and Lyrics by Holt Marvell. Musical Numbers by George Posford. At the two Pianos: Harry S. Pepper and Doris Arnold. 10.20 p.m.—12 midnight.—Dance Music. 12 midnight-12.5 a.m. (Friday).—Experimental Transmission for the Radio Research Board. By the Fultograph Process.

10.15 a.m.—The Daily Service. 10.30 a.m.—Time Signal (Greenwich), Weather Forecast. 10.45-11.0 a.m.—Lady Cynthia Mosley, M.P.: "The Week in Westminster." 12 noon—Speech of His Majesty the King Emperor in opening The Indian Round Table Conference, together with subsequent speeches, including that of the Prime Minister of the United Kingdom, relayed from The Royal Gallery of the House of Lords. 1.0 p.m.—Light Music. Frascati's Orchestra, directed by Georges Haeck. 2.0 p.m.—Beethoven Songs. Doris Bonsor (Soprano), William Barrand (Bass). 2.25 p.m.—Interlude. 2.30 p.m.—For the Schools—Professor Winifred Cullis, C.B.E., "Biology and Hygiene for Senior Schools—Your Body Every Day: VIII. How the Transport System is Worked—I." 2.55 p.m.—East Anglian Herring Fishing Bulletin. 3.0 p.m.—Mr. J. C. Stobart and Miss Mary Somerville: "Children in Books—VIII." 3.25 p.m.—Interlude. 3.30 p.m.—Symphony Concert. The Bournemouth Symphony Orchestra, conducted by Sir Dan Godfrey. (Soloist, Cyril Smith.) 4.45 p.m.—Reginald New at the Organ of The Beaufort Cinema. Relayed from Washwood Heath, Birmingham. 5.15 p.m.—The Children's Hour. 6.0 p.m.—Ministry of Agriculture Fortnightly Bulletin. 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin. 6.35 p.m.—London Stock Exchange Report; Fat Stock Prices for Farmers. 6.40 p.m.—The Foundations of Music. Mozart Quartets. 7.0-7.20 p.m.—"Girls and a Career Overseas"—A Dialogue between two Headmistresses (Under the Auspices of The Oversea Settlement Department). 7.25 p.m.—Industry Looks Ahead. 7.35 p.m.—Sir Josiah Stamp, G.B.E., D.Sc.: "Modern Directorship and Management"—II. 7.45 p.m.—Interval. 8.0 p.m.—B.B.C. Symphony Concert—IV. Relayed from The Queen's Hall, London. Arthur Catterall (Violin), Robert Murchie and Frank Almgill (Flutes), Alec Whittaker, J. Panting, T. McDonagh (Oboes), Richard Newton (Bassoon), Aubrey Brain-ton (Trumpet), Leon Goossens (Oboe d'Amore), Harold Samuel (Pianoforte), Keith Falkner (Bass). The B.B.C. Symphony Orchestra (Leader, Arthur Catterall). Conducted by Sir Henry Wood. 9.5 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 9.20 p.m.—Symphony Concert. Part II. 10.5 p.m.—Topical Talk. 10.20 p.m.—Shipping Forecast; New York Stock Market Report. 10.25 p.m.—12 midnight.—Dance Music.

FRIDAY (14)

10.15 a.m.—The Daily Service. 10.30 a.m.—Time Signal (Greenwich), Weather Forecast. 10.45-11.0 a.m.—"Strange People and Places"—VI. Lady Chatterjee: "India"—II. 12 noon.—A Sonata Recital. Ruth Araujo (Violin), Denise Durbce (Pianoforte). 12.30 p.m.—Organ Recital. By Leonard H. Warner. Joan de Ferrars (Soprano). 1.30 p.m.—Gramophone Records. 2.25 p.m.—Interlude. 2.30 p.m.—For the Schools. "Rural Science." Mr. C. E. Hudson. 2.55 p.m.—East Anglian Herring Fishing Bulletin. 3.0 p.m.—Peoples and Lands of the British Empire—VIII, The Antarctic." 3.20 p.m.—Interlude. 3.25 p.m.—Mr. Frank Roscoe: Friday Afternoon Stories and Talks—VIII. 3.40 p.m.—Interlude. 3.45 p.m.—Dramatic Reading—IV. Scenes from "Antony and Cleopatra" (Shakespeare).

By Owen Rutter. Declaimed by Gordon Bailey. Supported by The Midland Studio Male Voice Chorus and The Birmingham Military Band, conducted by W. A. Clarke. Adapted and Produced by Charles Brewer. 7.15 p.m. (London).—Music of Edward German. Marian Carew (Soprano), The Victor Olof Sextet. 7.15 p.m. (Midland).—An Interlude. By George Hackford (Xylophone and Vibraphone). 7.30 p.m. (Midland).—An Organ Recital. By G. D. Cunningham. 8.30 p.m.—"The Spirit of Adventure"—VII, Sir John Franklin. 9.0 p.m. (London).—Chamber Music. Mark Raphael (Baritone), Victor Hely-Hutchinson (Pianoforte). The London Wind Quintet. Robert Murchie (Flute); Leon Goossens (Oboe); Haydn Draper (Clarinet); Fred Wood (Bassoon); Edmund Chapman (Horn). 9.0 p.m. (Midland).—The Duds' Concert Party. In a Programme of Mirth and Melody. 10.15-10.30 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 10.30-10.35 p.m. (Midland).—Experimental Transmission for the Radio Research Board by the Fultograph Process. 10.30-12 midnight (London).—Dance Music.

4.15 p.m.—For Schools. Specially Selected Gramophone Records. 4.30 p.m.—Light Music. Moschetto and his Orchestra. 5.15 p.m.—The Children's Hour. 6.0 p.m.—Mrs. Leslie Menzies: "Furnishing the Winter Table." 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin. 6.35 p.m.—London Stock Exchange Report; Fat Stock Prices for Farmers. 6.40 p.m.—The Foundations of Music. Mozart Quartets. 7.0-7.20 p.m.—"This Surprising World." Mr. Gerald Heard. 7.25 p.m.—"The Dark Continent"—VII. Mrs. Ruxton: "Black and White: Two Civilisations Meet." 7.45 p.m.—An Orchestral Concert. The National Orchestra of Wales. (Leader, Louis Levitus.) Conducted by Warwick Braithwaite. (Solo Violin, Louis Levitus.) Helen de Frey (Soprano). 9.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 9.15 p.m.—Shipping Forecast; New York Stock Market Report. 9.20 p.m.—"People and Things." The Hon. Harold Nicolson. 9.35 p.m.—A Light Orchestral Concert. George Parker (Baritone). The London String Quartet: John Pennington (Violin); Thomas Petre (Violin); William Primrose (Viola); C. Warwick Evans (Violoncello). 10.45-11.0 p.m.—Reading. 11.0 p.m.—12 midnight.—Dance Music.

SATURDAY (15)

10.15 a.m.—The Daily Service. 10.30 a.m.—Time Signal (Greenwich), Weather Forecast. 10.45-11.0 a.m.—"Hobbies and Handicrafts"—IX. Mrs. J. Webb: "Christmas Presents from Remnants." 1.0-2.0 p.m.—Light Music. The Commodore Grand Orchestra, directed by Joseph Muscant. 3.25 p.m.—East Anglian Herring Fishing Bulletin. 3.30 p.m.—The Luton Red Cross Band. Mario de Pietro (Mandoline). 4.45 p.m.—Reginald New at the Organ. 5.15 p.m.—The Children's Hour. 6.0 p.m.—A Programme by the Winners of the Boy Scouts' Musical Festival. 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin; Football Results; Fat Stock Prices for Farmers. 6.40 p.m.—London Sports Bulletin. 6.45 p.m.—The Foundations of Music. Mozart Quartets. 7.0 p.m.—Topical Talk. 7.20 p.m.—The Week's Work in the Garden, by the Royal Horticultural Society. 7.30 p.m.—A Recital of Cyril Scott's Songs by Kate Winter. 7.45 p.m.—"The Ridgeway Parade"—VI. Music arranged by Dorothy Hogben. Devised, Written and Produced by Philip Ridgeway. 9.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 9.15 p.m.—Shipping Forecast. 9.20 p.m.—"The Edges of the World"—XI. Mrs. Rogers: A Missionary's Wife in Tristan da Cunha. 9.35 p.m.—An Orchestral Concert. The B.B.C. Orchestra, conducted by Joseph Lewis. Alfred Cave (Violin). 10.30 p.m.—12 midnight.—Dance Music.

(Continued from page 733) 6.40 p.m. (London).—The St. George's Singers. 6.40 p.m. (Midland).—"Paddy Pools." A Fantasy by Miles Malleson. 7.10 p.m.—The Ridgeway Parade—VI. 8.25 p.m.—Regional News. 8.30 p.m.—"Electricity in our Bodies"—I. Mr. Bryan H. C. Matthews: "Animal Electricity." 9.0 p.m. (London).—The Wireless Military Band, conducted by B. Walton O'Donnell. Katharine Arkandy (Soprano). 9.0 p.m. (Midland).—The Midland Studio Orchestra, under the direction of Frank Cantell. Kenneth

and George Western will entertain. 10.15 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 10.30-11.0 p.m. (Midland).—As London. 10.30 p.m.—12 midnight (London).—Dance Music. 12 midnight-12.30 a.m. (Saturday) (London).—Experimental Television Transmission by the Baird Process (356.3 m., Vision; 261.3 m., Sound).

1.0-2.0 p.m. (London).—National Programme. 3.30 p.m. (London).—National Programme. 3.30 p.m. (Midland).—The Midland Studio Orchestra. Under the direction of Frank Cantell. James Coleman (Bass). 4.45 p.m.—Reginald New at The Organ. 5.15 p.m. (London).—Dance Music. 5.15 p.m. (Midland).—Children's Hour. 6.0 p.m. (Midland).—As London. 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin; Football Results. 6.40 p.m.—Sports Bulletin. 6.45 p.m.—"The Song of Tiadatha."

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The "Wireless Trader" test report on the **GAM-BRELL A.C. THREE**, said:—

"TOULOUSE, clear of LONDON REGIONAL, LANGENBURGH clear of MIDLAND REGIONAL, KOENIGSWUSTERHAUSEN clear of 5XX and RADIO PARIS, a feat not generally performed by a set of this nature under these conditions of test."

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Page 674 of last week's "World-Radio" gave some interesting information regarding The Radio Novogram and the Buckingham Models.

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REGIONAL PROGRAMMES

(November 9-15)

Midland

626 kc/s (479.2 m.) (38 kW.)

SUNDAY (NOV. 9)

3.30 p.m. (London).—Callender's Band. Doris Vane (Soprano), Dale Smith (Baritone). 3.30 p.m. (Midland).—A Military Band Concert. The Birmingham Military Band, conducted by W. A. Clarke. John Adams (Tenor), Judith de Leeuw (Pianoforte). 5.0-5.15 p.m.—Bible Reading. The Letters of St. Paul—XV. I Timothy, i, ii and iii. 7.55 p.m. (London).—National Programme. 8.45 p.m. (Midland).—National Programme. 8.50 p.m.—"The News." Weather Forecast, General News Bulletin. 9.0 p.m.—Regional News. 9.5 p.m.—Sunday Orchestral Concert—III. Harold Williams (Baritone), Paul Hindemith (Viola), The B.B.C. Orchestra (Leader, Arthur Catterall), conducted by Sir Henry Wood.

MONDAY (10)

10.15-11.0 a.m. (London).—National Programme. 11.0-11.30 a.m. (London).—Experimental Television Transmission by the Baird Process (356.3 m. Vision; 261.3 m. Sound). 12 noon.—A Ballad Concert. Mendelssohn's Songs and Duets. Josephine Malone (Soprano), Murray Fisher (Contralto). 12.30 p.m.—Margery Rainbow (Violin), Maud Randle (Pianoforte). 1.0 p.m.—Light Music. The Piccadilly Restaurant Orchestra, directed by Max Jaffa. 2.0-3.0 p.m.—Lozell's Picture House Orchestra, conducted by Ernest Parsons. 3.20 p.m. (London).—National Programme. 5.15 p.m. (London).—Jack Payne and his B.B.C. Dance Orchestra. 5.15 p.m. (Midland).—The Children's Hour. 6.0 p.m. (Midland).—As London. 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin. 6.40 p.m.—"The First News." Weather Forecast, First General News Bulletin.

ther Forecast, First General News Bulletin.

6.40 p.m. (London).—The Gershom Parkinson Quintet. Sidney Northcote (Tenor). 6.40 p.m. (Midland).—The Midland Studio Orchestra, under the direction of Frank Cantell. Howard Fry (Baritone), Frank Venton (Viola). 7.45 p.m. (London).—H.R.H. the Prince of Wales. "Poppy Day." 8.0 p.m.—Monsieur E. M. Stéphan: French Talk. 8.30 p.m.—Regional News. 8.35 p.m. (London).—A Pianoforte Recital by Shepherd Munn. 8.35 p.m. (Midland).—"Come, Pipe a Song." The Midland Studio Chorus, under the direction of Nigel Dallaway. 9.0 p.m.—National Programme. 9.30 p.m.—Vaudeville. 10.15 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 10.30 p.m.—12 midnight (London).—Dance Music. 10.30-11.0 p.m. (Midland).—As London Regional Programme.

TUESDAY (11)

10.30-11.10 a.m. (approx.).—The Cenotaph Service. 12 noon.—An Instrumental Concert. Marion Knight (Contralto); W. L. Trytel and his Octet. 1.0 p.m. (London).—Reginald Foot at the Organ. 1.0 p.m. (Midland).—Reginald New at the Organ. 2.0-3.0 p.m.—The Midland Studio Orchestra. Directed by Frank Cantell. 4.30 p.m. (London).—National Programme. 5.15 p.m. (London).—Jack Payne and his B.B.C. Dance Orchestra. 5.15 p.m. (Midland).—The Children's Hour. 6.0 p.m. (Midland).—As London. 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin. 6.40 p.m.—(London).—The Wireless

Military Band. Conducted by B. Walton O'Donnell. Tom Kinniburgh (Bass).

6.40 p.m. (Midland).—Light Music. Pattison's Salon Orchestra. Under the direction of Norris Stanley. 7.30 p.m. (Midland).—A Lieder Recital by Robert Maitland (Baritone). 7.55 p.m.—Regional News. 8.0 p.m. (London).—An Orchestral Concert: Stiles Allen (Soprano). The B.B.C. Orchestra. Conducted by Joseph Lewis. 8.30 p.m. (Midland).—The Midland Studio Orchestra, under the direction of Frank Cantell. Grace Field (Soprano). 9.0-10.20 p.m.—National Programme. 12 midnight-12.30 (Wednesday) (London).—Experimental Television Transmission by the Baird Process (356.3 m. Vision; 261.3 m. Sound).

WEDNESDAY (12)

10.15-11.0 a.m. (London).—National Programme. 11.0-11.30 p.m. (London).—Experimental Television Transmission by the Baird Process (356.3 m. Vision; 261.3 m. Sound). 12 noon.—Speech of His Majesty the King Emperor in opening the Indian Round Table Conference together with subsequent Speeches. Relayed from The Royal Gallery of the House of Lords. 1.30-3.0 p.m.—The Midland Studio Orchestra. Under the direction of Frank Cantell. Albert Townsend (Bass); Walter Heard (Flute). 5.15 p.m. (London).—Jack Payne and his B.B.C. Dance Orchestra. 5.15 p.m. (Midland).—The Children's Hour. 6.0 p.m. (Midland).—As London. 6.15 p.m.—"The First News." Weather Forecast; First General News Bulletin. 6.40 p.m. (London).—Reginald King's Orchestra. Arthur Hosking (Baritone). 6.40 p.m. (Midland).—The Midland Studio Orchestra. Under the

direction of Frank Cantell. Iris Hoddell (Contralto); Jan Berenska (Violin).

8.0 p.m.—Mr. Otto Siepman: German Talk. 8.30 p.m.—Regional News. 8.35 p.m. (London).—A Brass Band Concert. Newcastle-upon-Tyne City Police Band. Conducted by Mr. W. A. Crosse. A. E. Rogers (Baritone). 8.35 p.m. (Midland).—The City of Birmingham Police Band Annual Concert. Conducted by Richard Wassell; Stiles Allen (Soprano); Tudor Davies (Tenor). 9.35 p.m.—"Give Me New York." Book and Lyrics by Holt Marvell. Musical Numbers by George Posford. 10.15 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 10.30 p.m.—12 midnight (London).—Dance Music. 10.30-10.35 p.m. (Midland).—Experimental Transmission for the Radio Research Board by the Fultograph Process.

THURSDAY (13)

10.15-11.0 a.m. (London).—National Programme. 11.0-11.30 a.m. (London).—Experimental Television Transmission by the Baird Process (356.3 m. Vision; 261.3 m. Sound). 12 noon.—A Ballad Concert. Leonard Barraclough (Tenor), Gwendoline Welborn (Pianoforte), Dorothy Browning (Contralto), Peter Howard (Baritone), Stanley Lowe (Violin). 1.0 p.m.—The Shepherd's Bush Pavilion Orchestra, conducted by Louis Levy. 2.0-3.0 p.m.—The Midland Studio Orchestra, directed by Frank Cantell. 4.30 p.m. (London).—National Programme. 5.15 p.m. (London).—Jack Payne and his B.B.C. Dance Orchestra.

5.15 p.m. (Midland).—The Children's Hour.

6.0 p.m. (Midland).—As London. 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin. 6.40 p.m.—"Food Supply and the Future"—I, Dr. J. B. Orr. 7.0 p.m. (London).—The J. H. Squire Celeste Octet, Lucille Long (Contralto). 8.10 p.m. (London).—A Discussion on the National Theatre, between Mr. Geoffrey Whitworth, Secretary of the British Drama League, and Mr. Michael Sadleir. 8.55 p.m.—Regional News. 9.0 p.m.—The London String Players (Leader, Jean Pougnet), conductor, Herbert Menges. Eda Kersey (Violin). 10.15 p.m.—"The Second News." Weather Forecast, Second General News Bulletin. 10.30 p.m.—12 midnight (London).—Dance Music.

FRIDAY (14)

10.15 a.m. (London).—National Programme. 11.0-11.30 a.m. (London).—Experimental Television Transmission by the Baird Process (356.3 m. Vision; 261.3 m. Sound). 12 noon.—The Midland Studio Orchestra, directed by Frank Cantell, Horace Priestley (Tenor). 1.15 p.m.—Light Music. Moschetto and his Orchestra, from the May Fair Hotel. 2.15-3.0 p.m.—Dance Music. Jack Kerr and his Band. 4.30 p.m. (London).—National Programme. 5.15 p.m. (London).—Jack Payne and his B.B.C. Dance Orchestra. 5.15 p.m. (Midland).—The Children's Hour. 6.0 p.m. (Midland).—As London. 6.15 p.m.—"The First News." Weather Forecast, First General News Bulletin.

(Continued on page 732)

PROGRAMMES FOR SUNDAY (November 9)

The Frequencies and Wavelengths given in the following programmes are those published by the stations in question. For more accurate measurements, readers are referred to our Table of Frequencies and Wavelengths.

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

ALGIERS (N. Africa) 825.3 kc/s (363.4 m.); 13 kW. 12.30 p.m.—Gramophone Concert. 8.30 p.m.—Vocal and Orchestral Concert.

BARCELONA (Spain) Radio-Barcelona (EAJ1). 860 kc/s (349 m.) 1-8 kW. 8.0-9.0 a.m.—Topical Review. 11.0 a.m.—Chimes and Weather. 1.0 p.m.—Sextet Selections and Gramophone Records. 3.0 p.m.—Programme for Hospitals and Benevolent Institutions. 4.0-5.30 p.m.—Interval. 5.30 p.m.—Agricultural Programme, followed by Part Relay of an Opera from El Gran Teatro del Liceo, Barcelona. 8.15 p.m.—Orchestral Concert. 9.5 p.m.—Gramophone Records. 12 midnight (approx.).—Close Down.

BERLIN (Germany) Königs Wusterhausen. 183 kc/s (1,635 m.); 35 kW. 6.0 a.m.—5.0 p.m.—See Berlin (Witzleben). 5.0 p.m.—Rural Programme. 5.30 p.m.—Talk: Hunting Experiences in Kashmir. 6.0 p.m.—Talk: The Contemporary Theatre. 6.30 p.m.—Jacob Martin Dolata reads from his own Poems. 7.0-11.30 p.m.—Programme relayed from Berlin (Witzleben). 11.30 p.m. (approx.).—Close Down.

BERLIN (Germany) Witzleben. 716 kc/s (418 m.); 1.7 kW. 6.0 a.m.—Wireless Gymnastics, followed by Concert. 7.0 a.m.—Agricultural Programme.

7.50 a.m.—Chimes from the Garrison Church, Potsdam, followed by Vocal and Instrumental Music and Recitations. After the Recital, Berlin Cathedral Chimes. 9.5 a.m.—Weather Forecast. 10.0 a.m.—"Nur Jedem das Seine"—Cantata No. 163 for Soprano, Contralto, Tenor and Bass (Joh. S. Bach). 10.30 a.m.—Talk for Parents. 11.0 a.m.—Programme from Leipzig. 1.0 p.m.—Programme for Young People: "The Fire Brigade"—A Memory of Childhood (Friedrich Wolf).

1.40 p.m.—Talk by Charlotte von der Trenck: Siegfried von der Trenck. 2.5 p.m.—Tenor Song Recital. 2.20 p.m.—Talk: Voyages of Exploration to Java, Sumatra and Bali. 2.40 p.m.—Handball Match, Berlin v. Hamburg, relayed from the Old SCC Ground. 3.10 p.m.—Concert of Popular Orchestral Music. 4.30 p.m.—Willi Schaeffers and his Studio. 5.30 p.m.—Portraits of Actors—Elizabeth Bergner. 6.0 p.m.—Pianoforte Recital. Sonata in F Major, Op. 10 (Beethoven); Burlesque in G Minor, and Sonata in C Major (Scarlatti) Caprice (David-Liszt).

6.30 p.m.—Talk: November 9th. 7.0 p.m.—"Prince Igor"—Opera in Four Acts and a Prologue (Borodin), relayed from the Opera House, Unter den Linden. 9.5 p.m. (in the interval).—News and Sports Notes. 10.15 p.m.—Weather, News, Sports Notes and Dance Music. In the interval: Report on the Six Days' Racing. 11.30 p.m. (approx.).—Close Down.

BERNE (Switzerland) Radio-Bern. 743 kc/s (403 m.); 1.1 kW. Transmits at intervals from 9.30 a.m. 6.28 p.m.—Time and Weather.

6.30 p.m.—Reading from the Works of Leo Tolstol. 7.0 p.m.—The Kreutzer Sonata (Beethoven). 7.30 p.m.—Reading: "Die Flucht zu Gott" (Stefan Zweig). 8.40 p.m.—Concert from the Kursaal Schänzli. 9.0 p.m.—Sports Notes, News, Weather and Close Down.

BRATISLAVA (Czechoslovakia) 1,076 kc/s (279 m.); 14 kW. 7.30 a.m.—Agricultural Report. 8.0 a.m.—Programme from Prague. 9.0 a.m.—Programme from Brno. 11.0 a.m.—Programme from Prague. 5.0 p.m.—A Play in the Studio. 5.40 p.m.—Gramophone Records. 5.55 p.m.—Programme from Prague. 6.0 p.m.—Programme from Brno. 6.30 p.m.—Programme from Prague. 7.10 p.m.—Programme from Brno. 8.10 p.m.—Slovakian Programme. 9.0 p.m.—Programme from Prague. 9.15 p.m.—Programme Announcements. 9.20 p.m.—Programme from Moravská-Ostrava.

BRESLAU (Germany) 923 kc/s (325 m.); 1.7 kW. Relayed by Gleiwitz, 1,157 kc/s (259 m.). 7.45 a.m.—Gramophone Concert. 8.15 a.m.—Christ Church Chimes. 8.30 a.m.—Concert (continued). 10.0 a.m. (from Gleiwitz).—Catholic Service. 11.0 a.m.—Programme from Leipzig. 1.0 p.m.—Midday Report. 1.10 p.m.—Guessing Competition. 1.20 p.m.—Talk for Chess Players. 1.35 p.m.—Talk on Sports. 1.45 p.m.—Talk: The Great International Philatelic Exhibition in Berlin. 1.55 p.m.—Talk: Wills and Death Duties. 2.10 p.m.—Talk on Communication Questions. 2.20 p.m.—Talk for Farmers. 2.35 p.m.—Orchestral Concert.

3.20 p.m.—Music for Children. 3.50 p.m.—Review of Books. 4.5 p.m.—Relay of the Water Polo Match, Charlottenburg v. Breslau, from the Breslau Swimming Baths. Gramophone Records in the intervals. 4.45 p.m.—Vocal and Orchestral Recital from the Works of Arnold Mendelssohn, relayed from the Evangelical Church, Ratibor, Upper Silesia. 5.25 p.m.—Weather for Farmers. 5.27 p.m.—Concert by the Breslau Male Voice Choir. 6.0 p.m.—Talk on Music—a Musical Evening in the Goethe House at Weimar. 6.25 p.m.—Weather for Farmers. 6.30 p.m.—See Berlin (Witzleben). 7.0 p.m.—Music from "Tannhäuser" (Wagner), by the Soloists and Choir of the Breslau Municipal Theatre and the Silesian Philharmonic Society. 8.10 p.m.—Offenbach Ballet Suite for Orchestra (Rudolf Senger). 9.10 p.m.—Time, Weather, News, Sports Notes and Programme Announcements. 10.35 p.m.—Dance Music from Berlin (Witzleben). 11.30 p.m. (approx.).—Silent Night.

BRNO (Czechoslovakia) 878 kc/s (342 m.); 3 kW. 7.30 a.m.—Agricultural Talk. 8.0 a.m.—Programme from Prague. 9.0 a.m.—Symphony Concert, relayed from the Municipal Theatre. 11.0 a.m.—Programme from Prague. 1.0 p.m.—Talk: The Life of Italian Women. 1.30 p.m.—Programme from Prague. 5.45 p.m.—Story Readings. 5.55 p.m.—Programme from Prague. 6.0 p.m.—Brass Band Concert. 6.50 p.m.—Violin Recital. 7.10 p.m.—"The Maid of Elizondo"—Comic Opera in One Act (Offenbach). 8.10 p.m.—Programme from Bratislava. 9.0 p.m.—Programme from Prague. 9.15 p.m.—Theatre Review. 9.20 p.m.—Programme from Moravská-Ostrava.

BRUSSELS (Belgium) Radio-Belgique. 590 kc/s (508.5 m.); 1.2 kW. 5.0 p.m.—Gramophone Concert. 6.0 p.m.—Dance Music from the Armenonville Tea-Room. 6.30 p.m.—Gramophone Concert. 7.30 p.m.—Le Journal Parlé. 8.10 p.m.—Talk: The Humanitarian Work of the League of Nations. 8.15 p.m.—Orchestral Concert. Overtures "L'annhäuser" (Wagner) Song. Ballet Music from "Patrie" (Paladilhe). "Cello Solo: Kol Nidrei" (Bruch). Selection from "Cavalleria Rusticana" (Mascagni). Songs. Ballet Music from "Le Cid" (Massenet). Song. Wedgwood Blue (Ketelbey). Songs. Joyeuse marche (Chabrier). 10.15 p.m.—News Bulletin.

BRUSSELS (No. 2) (Belgium) 887 kc/s (338.2 m.); 12 kW. 5.0 p.m.—Programme for Children. 7.15 p.m.—Gramophone Records. 7.45 p.m.—Programme by the "Fogen" Club. 9.0 p.m.—Concert of Hunting Horn Music. 9.20 p.m.—Recital of Roma.

BUCHAREST (Romania) Radio-Bucarest. 761 kc/s (394 m.); 16 kW. Transmits at intervals from 9.15 a.m. 7.0 p.m.—Pianoforte Recital. 7.30 p.m.—Talk (to be announced). 7.45 p.m.—Recital of Songs. 8.15 p.m.—Violin Recital. 8.45 p.m.—The Letter Box. 9.0 p.m.—News Bulletin.

BUDAPEST (Hungary) 545 kc/s (550 m.); 21 kW. 8.0 a.m.—News and Beauty Hints. 9.0 a.m.—Divine Service from the Coronation Church. 10.15 a.m.—Evangelical Service, followed by Orchestral Concert. 1.0 p.m.—Gramophone Records. 2.30 p.m.—Agricultural Talk. 3.0 p.m.—Hungarian Folk Songs for String Quartet. In the interval, Talk. 4.15 p.m.—Military Band Concert. 5.30 p.m.—Reading.

Programmes for Sunday—(Cont.)

6.15 p.m.—Orchestral Concert of Operetta Music and-Waltzes, followed by Concert by a Tzigane Orchestra from the Hotel Gellert.

COLOGNE (Germany) Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 1.7 kW. See Langenberg Programme.

COPENHAGEN (Denmark) 1,067 kc/s (281 m.); 1 kW. Relayed by Kalundborg, 260 kc/s (1,153 m.).

10.30 a.m.—Weather and News. 11.0 a.m.—Town Hall Chimes. 11.2 a.m.—Instrumental Concert. 12 noon—1.0 p.m.—Language Lessons.

12 noon.—English: Talk on Shakespeare. 12.20 p.m.—Talk in German: The Weimar Classics—Goethe and Schiller.

12.40 p.m.—Talk in French: Alfred de Vigny. 1.0 p.m.—Wind Instrument Concert, with Pianoforte Solos. 3.0 p.m.—Talk for Children. 4.0 p.m.—Divine Service from Elias Church.

CORK (Ireland) (6 CK) 1,337 kc/s (225 m.); 1.5 kW. 8.30—11.0 p.m.—See Dublin.

CRACOW (Poland) Polskie Radio. 1,229 kc/s (244 m.); 1.5 kW. Transmits at intervals from 9.15 a.m.

DUBLIN (Ireland) (2RN). 725 kc/s (413 m.); 1.5 kW. 8.30 p.m.—Time Signal. 8.32 p.m.—Concert. The Civic Guard Band.

FRANKFURT-am-MAIN (Germany) 770 kc/s (390 m.); 1.7 kW. Relayed by Cassel, 1,220 kc/s (246 m.).

1.0 p.m.—Programme for Children. 1.50 p.m.—Talk on the following Transmission. 1.55 p.m.—"The Pearl Fishers"

Sketches—Pater Martin von Cochem. 5.55 p.m.—Programme arranged by the Frankfurter Zeitung. 6.20 p.m.—Sports Notes. 6.30 p.m.—A Hundred Minutes of Austria

HAMBURG (Germany) Norag (ha, in Morse). 806 kc/s (372 m.); 1.7 kW. Relayed by Bremen, 950 kc/s (315.8 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 530 kc/s (566 m.)

10.0 a.m.—Talk: German Farmers in Central America. 10.30 a.m.—Concert from the Ostermann Restaurant.

11.55 a.m. (in an interval).—Weather Report. 12 noon.—Sponsored Concert. 12.45 p.m.—Midday Concert. 1.25 p.m.—Programme for Children.

4.0 p.m.—Choral Concert from the Parkhaus, Bremen. 5.0 p.m. (from Hanover).—Recital of Operatic Arias. Selections from "Marion Delorme" and "La Gioconda"

6.40 p.m.—Sports Notes and Weather. 7.0 p.m.—"Fidelio"—Opera in Two Acts (Beethoven).

9.50 p.m.—Concert. Overture, "Light Cavalry" (Suppe). Dance of the Dervishes (Bendix). Waltz, Hofflebe der Tanz (Waldteufel). Selection from "The Czarevitch" (Léhar).

HILVERSUM (Holland) 1,004 kc/s (308.8 m.); 8.5 kW. 8.40—11.0 a.m.—Programme of the Workers' Radio Society (V.A.R.A.).

11.0 a.m.—Relay of the Opening of the Exhibition of Modern Scenic Art. 11.15 a.m.—Morning Concert. 1.0 p.m.—Lesson in Chess.

LANGENBERG (Germany) Westdeutscher Rundfunk. 635 kc/s (473 m.); 1.7 kW. Relayed by Aachen, Cologne, and Münster, 1,319 kc/s (227 m.).

from "Les Saltimbanques" (Ganne). 9.40 p.m.—Performance of a Play. 10.10 p.m.—Orchestral Concert. 10.40 p.m.—Gramophone Records. 11.40 p.m. (approx.).—Close Down.

HUIZEN (Holland) 160 kc/s (1,875 m.); 8.5 kW. 8.5—9.0 a.m.—Programme of the Christian Radio Society (N.C.R.V.). Morning Recital. 9.40 a.m.—4.40 p.m.—Programme of the Catholic Radio Society (K.R.O.).

11.40 a.m.—Sextet Concert. 1.10—2.10 p.m.—Two Talks. 2.10 p.m.—Orchestral Concert. 4.10 p.m.—Programme for Hospitals.

KALUNDBORG (Denmark) Kalundborg Radio. 260 kc/s (1,153 m.); 10 kW. See Copenhagen Programme.

KATOWICE (Poland) Polskie Radio. 734 kc/s (408 m.); 16 kW. Transmits at intervals from 9.0 a.m.

9.0 p.m.—Talk by Mr. Mar. 9.15 p.m.—Musical Programme. 9.50 p.m.—Meteorological Report, Programme Announcements in French, Sports Notes and News. 10.0 p.m.—Dance Music.

KAUNAS (Lithuania) Radio Kaunas. 155 kc/s (1,935 m.); 7 kW. Transmits at intervals from 9.0 a.m.

KÖNIGSBERG (Germany) Ostmarken Rundfunk. 1,085 kc/s (276 m.); 1.7 kW. Relayed by Danzig, 662 kc/s (453 m.).

11.0 a.m.—Relay of the Opening of the Exhibition of Modern Scenic Art. 11.15 a.m.—Morning Concert. 1.0 p.m.—Lesson in Chess.

LAHTI (Finland) 167 kc/s (1,796 m.); 54 kW. Relayed by Helsingfors, 1,355 kc/s (221 m.). Transmits at intervals from 6.45 a.m.

LANGENBERG (Germany) Westdeutscher Rundfunk. 635 kc/s (473 m.); 1.7 kW. Relayed by Aachen, Cologne, and Münster, 1,319 kc/s (227 m.).

5.45 a.m.—Lesson in Self-defence. 6.0 a.m.—Programme from Hamburg. 7.0 a.m.—Gramophone Concert. 7.30 a.m.—Esperanto for Beginners—Programme Announcements.

10.55 a.m.—Gramophone Records of the Milan Scala Artistes and Orchestra in "La Bohème" (Puccini).

12 noon.—Orchestral Concert. 1.30 p.m.—Wireless Literature. 1.50 p.m.—Shorthand Speed Dictation. 2.25 p.m.—Talk for Girls: Little Presents.

LEIPZIG (Germany) Mitteldeutscher Rundfunk. 1,184 kc/s (253 m.); 2.3 kW. Relayed by Dresden, 941 kc/s (319 m.).

11.0 a.m.—Orchestral Concert. 11.55 a.m.—Time Signal. 12 noon.—Gramophone Concert. 1.0 p.m.—Weather, Time and Topical Programme.

MADRID (Spain) Union Radio (EAJ7). 707 kc/s (424 m.); 2 kW. 8.0 a.m.—Topical Review. 11.30 a.m.—Concert by the Municipal Band from the Retiro (Weather permitting).

MILAN (Italy) Ente Italiano Audizioni Radiofoniche. 590 kc/s (501 m.); 8.5 kW. Programme relayed by Torino, 1,008 kc/s (273.2 m.) and Genova, 788 kc/s (381 m.).

MILAN (Italy) Ente Italiano Audizioni Radiofoniche. 590 kc/s (501 m.); 8.5 kW. Programme relayed by Torino, 1,008 kc/s (273.2 m.) and Genova, 788 kc/s (381 m.).

MILAN (Italy) Ente Italiano Audizioni Radiofoniche. 590 kc/s (501 m.); 8.5 kW. Programme relayed by Torino, 1,008 kc/s (273.2 m.) and Genova, 788 kc/s (381 m.).

MILAN (Italy) Ente Italiano Audizioni Radiofoniche. 590 kc/s (501 m.); 8.5 kW. Programme relayed by Torino, 1,008 kc/s (273.2 m.) and Genova, 788 kc/s (381 m.).

5.0 p.m.—Concert (continued). 5.30 p.m.—Sports Notes. 5.40 p.m.—(from Turin).—Light Variety Items.

6.20 p.m.—Announcements. 6.30 p.m.—Concert of Light Music. 7.10 p.m.—Giornale Radio. 7.30 p.m.—Time Signal. 7.32 p.m.—Dance Music Programme. 8.0 p.m.—Concert. Selection from "Il Guarany" (Gomes). Prelude, Sicilienne and Brindisi for Tenor, Choir and Orchestra, from "Cavalleria Rusticana" (Mascagni). Bucchanal from "Philemon and Baucis" (Gounod). Talk (to be announced). Prelude to "Lohengrin" (Wagner). Aria and Duet for Soprano and Tenor from "Madame Butterfly" (Puccini). Talk by L. Antonelli. Three Selections from "William Tell" (Rossini). Duet for Tenor and Soprano from "André Chénier" (Giordano). Selection from "Luca Miller" (Verdi). After the Concert: Dance Music from the Café Alfieri, Turin.

MORAVSKÁ-OSTRAVA (Czechoslovakia) 1,139 kc/s (263 m.); 11 kW. Transmits at intervals from 8.0 a.m.

MOTALA (Sweden) 222.5 kc/s (1,348 m.); 40 kW. See Stockholm Programme.

MUNICH (Germany) 563 kc/s (533 m.); 1.7 kW. Relayed by Augsburg, 536 kc/s (560 m.); Kaiserslautern, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (239 m.).

12.10 p.m.—Time, Weather and Programme Announcements. 12.15 p.m. (from Nürnberg).—Talk The 1930 Vintage. 12.40 p.m.—Gramophone Records of Russian Music.

OSLO (Norway) Kringkastingslaget 280 kc/s (1,071 m.); 75 kW. Relayed by Fredrikstad, 815 kc/s (368 m.); Hamar, 511 kc/s (587 m.); Notodden, 674 kc/s (445 m.); Porsgrund, 662 kc/s (453 m.); and Rjukan, 674 kc/s (445 m.).

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Programmes for Sunday—(Cont.)

4.50 p.m.—Chimes and Divine Service from St. Saviour's Church.
6.15 p.m.—Weather and News.
6.30 p.m.—Literary Review.
7.0 p.m.—Time Signal.
7.2 p.m.—Concert from the Works of Wagner.
8.0 p.m.—Talk: Whaling in the South Seas.
8.30 p.m.—News, Weather; Press Review.
8.50 p.m.—Topical Talk.
9.5 p.m.—Concert of Trio Music.
9.35 p.m.—Gramophone Dance Music.
11.0 p.m. (approx.)—Close Down.

PARIS (France)
Eiffel Tower (FL). 207 kc/s (1,445 m.); 15 kW.
7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
6.0 p.m.—Le Journal Parlé.
7.10 p.m.—Meteorological Forecast.
7.20 p.m.—Evening Concert. At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)
Poste Parisien. 914 kc/s (329 m.); 1.2 kW.
9.0 a.m.—Transmission of Pictures.
8.45 p.m.—Gramophone Records, Talk and News Bulletin.
9.0 p.m.—Concert. Overture, "Athalie" (Mendelssohn). Invitation to the Waltz (Weber-Berlioz). Hungarian Rhapsody, No. 12 (Liszt)—M. Casadesus conducting. Divertissement (Lalo). Romance for Viola and Orchestra (Bruch). Waltz No. 1 (Dvorak). La Fée polonoise from "Le roi m'agrè lui" (Chabrier).

PARIS (France)
Radio-Paris. (CFR). 174 kc/s (1,725 m.); 17 kW.
8.0 a.m.—News and Press Review.
8.30 a.m.—Physical Culture Lesson.
11.0 a.m.—Elementary Book-keeping Lesson.
11.15 a.m.—Gramophone Records.
12 noon.—Religious Address by Canon Lieutier.
12.30 p.m.—Gramophone Concert. In the intervals, News Bulletin and Bilboquet at a Lottery.
2.0 p.m.—Concert of Decca Records.

4.30 p.m.—The Five O'Clock Odéon.
5.30 p.m.—Concert from the Sarah Bernhardt Theatre.
7.0 p.m.—Agricultural Report and Racing Results.
7.15 p.m.—Economic and Social Notes and News.
7.30 p.m.—Radio-Paris Guignol.
8.0 p.m.—Musical Programme.
8.30 p.m.—Sports Notes and News.
8.45 p.m.—Radio Paris Music Hall. In the interval at 9.15 p.m.—Press Review, News and Time Signal.

POZNAN (Poland)
896 kc/s (335 m.); 1.9 kW. Also relayed on 9,830 kc/s (30.5 m.) from 4.15—5.15 p.m.; 6.0—7.0 p.m., and 9.15—11.0 p.m.
Transmits at intervals from 7.30 a.m.—Programme from Warsaw.
9.0 p.m.—Time, News, Sports and Police Notes.
9.15 p.m.—Dance Music from the Wielkopolska Café.
11.0 p.m. (approx.)—Close Down.

PRAGUE (Czechoslovakia)
Stranice. 617 kc/s (487 m.); 5.4 kW.
7.0 a.m.—Gramophone Records.
7.30 a.m.—Agricultural Report.
8.0 a.m.—Concert of Sacred Music of the 16th and 17th Centuries.
9.0 a.m.—Programme from Brno.
11.0 a.m.—Time and Chimes.
11.5 a.m.—Orchestral Concert.
12.30 p.m.—Agricultural Report.
1.30 p.m.—Relay from the National Theatre: "In the Well"—Opéramique (Blodek), followed by "I Pagliacci"—Opera in One Act (Leoncavallo).

4.30 p.m.—Talk for Workers.
5.0 p.m.—German Transmission. Selections from "Carmen"—Opera (Bizet).
5.55 p.m.—Sports Notes.
6.0 p.m.—Programme from Brno.
6.30 p.m.—Saxophone and Pianoforte Recital.
7.10 p.m.—Programme from Brno.
8.10 p.m.—Programme from Bratislava.
9.0 p.m.—Time, News and Sports Notes.
9.15 p.m.—News, Theatre Notes and Programme Announcements.
9.20 p.m.—Programme from Moravská-Ostrava.

RIGA (Latvia)
Radio Riga. 572 kc/s (525 m.); 13 kW. Transmits at intervals from 8.0 a.m.
6.3 p.m.—Vocal and Instrumental Concert. In the interval at 7.0 p.m.—News, and at 8.0 p.m.—Meteorological Report.
8.30 p.m.—Dance Music Programme.
10.0 p.m. (approx.)—Close Down.

ROME (Italy)
Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 75 kW. Relayed by Naples, 905 kc/s (332 m.); and Prato Smeraldo, 11,804 kc/s (25.4 m.).
9.0 a.m.—Reading from the Bible.
9.15 a.m.—Gramophone Records of Sacred Music.
9.45—10.0 a.m.—Sports Notes and Amusement Guide.
12.15 p.m.—Quintet Concert.
3.30 p.m. (from Naples)—Programme for Children; Weather Report.
4.0 p.m.—Time Signal.
4.2—6.0 p.m.—Concert, followed by Talk on Art and Dance Music Items.

6.50 p.m.—News; Sports Notes.
7.0 p.m.—Announcements and Press Review.
7.30 p.m.—Time Signal.
7.32 p.m.—Dance Music Programme.
8.5 p.m.—"The Duchess of Chicago"—Operetta in Three Acts (Kálmán).
Talk and Miscellaneous Notices in the intervals.

STOCKHOLM (Sweden)
Radiotjänst (SASA). 689 kc/s (436 m.); 75 kW. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 222.5 kc/s (1,348 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).
9.30 a.m.—Topical Talk.
10.0 a.m.—Divine Service Relay.
11.45 a.m.—Weather Report.
12.30 p.m.—Symphony Concert, relayed from Malmö, 1,301 kc/s (231 m.).
2.30 p.m.—Programme for Boys.
3.10 p.m.—Light Vocal and Instrumental Concert and Talk, relayed from Orsa, Falun.
4.30 p.m.—Talk on Swedish Artists: A. U. Wertmüller.
4.55 p.m.—Town Hall Chimes.
5.0 p.m.—Evensong.
6.10 p.m.—Reading from "The Clown Jac"—Serial Story (Bergman).

6.45 p.m.—An Extract from the "Oresteia"—Trilogy (Aeschylus), translated by Emil Zilliacus. Music by Hilding Rosenberg.
8.40 p.m.—Orchestral Concert.
10.0 p.m. (approx.)—Close Down.

STUTTGART (Germany)
Städtischer Rundfunk. 833 kc/s (360 m.); 1.7 kW. Relayed by Freiburg, 527 kc/s (570 m.).
6.0 a.m.—Gramophone Concert.
7.0 a.m.—Morning Gymnastics.
9.0 a.m.—Catholic Service from the Festhalle, Freiburg.
10.0 a.m.—Chamber Music.
11.0 a.m.—Promenade Concert from the Schlossplatz.
12 noon.—Topical Talk.
12.10 p.m.—Gramophone Records.
1.0—4.0 p.m.—See Frankfurt.
4.0 p.m.—Talk: A Visit to the Capital of Brazil.
4.30 p.m.—Orchestral Concert.
5.30 p.m.—Hans von Hülsen reads from his own Works.
6.0 p.m.—Time and Sports Notes.
6.10 p.m.—Alfred Auerbach reads Humorous Stories.
6.30—11.30 p.m.—Programme from Frankfurt. In the interval at 9.45 p.m.—Programme Announcements, News and Sports Notes.
11.30 p.m. (approx.)—Close Down.

TOULOUSE (France)
Radiophonie du Midi. 779 kc/s (385 m.); 8 kW.
1.20 p.m.—Divine Service followed by Concert.
1.30 p.m.—Agricultural Report.
1.45 p.m.—Divine Service.
5.0 p.m.—Dance Music Programme.
5.45 p.m.—Transmission of Pictures.
6.0 p.m.—Kolster Brandes Concert. Overture, Une fête à Aranjuez (Demersermann). Au trot de mon âne (Caludi). Sicilienne (Kunc). Ballet Music from "Hérodiade" (Massenet). Selection from "Les Mousquetaires de la Reine" (Halévy). Dance Music. Overture, Leonora (Beethoven). Ballet Music from "Henry VIII." (Saint-Saëns). Les fées au clair de lune (Langlois). Selection from "The Tales of Hoffmann" (Offenbach). Finale from the Fifth Symphony (Beethoven).
8.0 p.m.—News Bulletin.
8.15 p.m.—Concert by a Viennese Orchestra.
8.55 p.m.—Fashion Notes.

9.0 p.m.—Time Signal.
9.2 p.m.—Concert of Operetta Music.
10.0 p.m.—Hawaiian Guitar Music.
10.15 p.m.—North African News.
10.30 p.m.—Violin Solos.
10.40 p.m.—Concert of Broadcast Records, given by the Vocalio Gramophone Company.
12 midnight.—Late News and Close Down.

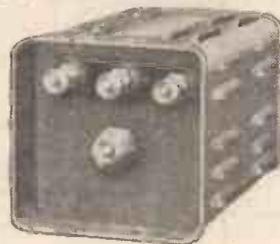
VIENNA (Austria)
Radio-Wien. 581 kc/s (516.3 m.); 20 kW. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
9.30 a.m.—Concert by the Vienna Boys' Choir.
10.5 a.m.—Orchestral Concert.
12 noon.—Time Signal and Programme Announcements.
12.5 p.m.—Gramophone Concert of Symphony Music.
2.0 p.m.—Time Signal.
2.5 p.m.—Vocal and Instrumental Concert.
3.45 p.m.—Talk on Bridge.
4.0 p.m.—Travel Talk: Through the South Seas.
4.30 p.m.—Concert of Chamber Music.
5.30 p.m.—Talk: India, her Language and Literature, with Gramophone Illustrations.
6.0 p.m.—Erich Kästner reads from his own Works, with Introductory Talk by Dr. E. Singer.
6.40 p.m.—Concert of Light Music.
7.35 p.m.—"Der ledige Hof"—Play in Four Acts (Ludwig Anzengruber).
9.30 p.m. (approx.)—First Results of the Austrian National Council Elections, News, and Concert of Light Music, followed by Gramophone Records. In the intervals: Results of the Austrian National Council Elections.

WARSAW (Poland)
Polskie Radio. 212 kc/s (1,411 m.); 14 kW.
Transmits at intervals from 9.15 a.m.
7.30 p.m.—Vocal and Instrumental Concert. In the interval at 8.10 p.m.—Literary Programme.
9.0 p.m.—Talk by Mr. Mar.
9.15 p.m.—Pianoforte Recital from the Works of Moniuszko.
9.50 p.m.—Weather, Police and Sports Notes.
10.0 p.m.—Dance Music Programme.
11.0 p.m. (approx.)—Close Down.

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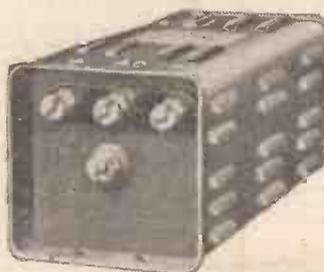
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PROGRAMMES FOR MONDAY (November 10)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

ALGIERS (N. Africa)

825.3 kc/s (363.4 m.); 13 kW.
Transmits at intervals from 12.30 p.m.
7.15 p.m.—Gramophone Records.
7.45 p.m.—News Bulletin.
8.0 p.m.—Concert from the Works of Debussy.
9.0 p.m.—Variety Concert—to suit all Tastes.
10.30 p.m.—Talk in Esperanto: The Native Population of Algiers.

BARCELONA (Spain)

Radio-Barcelona (E.A.J.); 860 kc/s (349 m.); 8 kW.
Transmits at intervals from 11.0 a.m.
6.0 p.m.—Trio Music and News.
7.0 p.m.—Gramophone Records.
8.30 p.m.—Talk: Great Spanish Humorous Writers—Enrique Garcia Alvarez.
9.0 p.m.—Chimes Weather, and News.
9.5 p.m.—Humorous Review of the Week's Events in Verse.
9.20 p.m.—Sardanas Recital by the Cobia Barcelona.
10.0 p.m.—News Bulletin.
10.5 p.m.—Concert of Chamber Music.
10.30 p.m.—Symphony Concert on Gramophone Records.
11.20 p.m.—Gramophone Records.
12 midnight (approx.)—Close Down.

BERLIN (Germany)

Königs Wusterhausen. 183 kc/s (1,635 m.); 35 kW.
Transmits at intervals from 5.25 a.m.
3.30 p.m.—See Berlin (Witzleben).
4.30 p.m.—Talk: The Harz Mountains in Poetry and Song, with Illustrations.
5.0 p.m.—Health Talk: The Care of Children—The Prevention of Deformity.
5.30 p.m.—Talk: The German Constitution.
6.0 p.m.—Elementary English Lesson.
6.30 p.m.—Agricultural Talk: German Agriculture and the South European Grain Problem.
6.55 p.m.—Weather for Farmers.
7.0 p.m.—Programme from Langenberg.
9.0 p.m.—Programme from Berlin (Witzleben).
11.30 p.m. (approx.)—Close Down.

BERLIN (Germany)

Witzleben. 716 kc/s (418 m.); 1.7 kW.
Transmits at intervals from 6.0 a.m.
3.30 p.m.—Pianoforte Trio in A Minor, Op. 50 (dedicated to Rubinstein) for Pianoforte, Violin and Cello (Tchaikovsky).
4.30 p.m.—Stories for Children.
4.50 p.m.—Talk: The Economic Importance of Social Insurance.
5.15 p.m.—Talk: Hygiene and Fashion.
5.40 p.m.—Tenor Song Recital from the Works of Franz Grothe, accompanied by the Composer.
6.15 p.m.—Labour Market Report.
6.50 p.m.—Reading of Anecdotes.
6.30 p.m.—Choral Concert from the Singakademie, Halle. Mass in C Major (Mozart). Vesperae solennes de confessoro (Mozart). Psalm 68 for Soprano, Contralto, Tenor and Bass (Händel).
7.35 p.m. (in the interval)—News and Sports Notes.
8.15 p.m.—An Acoustic Tour—What does Germany transmit?
9.20 p.m.—Weather, News and Sports Notes, followed by Dance Music Programme. In the interval: Report on the Six Days' Racing.
11.30 p.m. (approx.)—Close Down.

BERNE (Switzerland)

Radio-Berne. 743 kc/s (403 m.); 1.1 kW.
Transmits at intervals from 11.43 a.m.
6.28 p.m.—Time and Weather.
6.30 p.m.—Talk: The Cult of the Dead from its Beginnings up to the Carolingian Age.
7.0 p.m.—Ocarina Selections.
7.30 p.m.—Choral Concert.
9.0 p.m.—News and Weather.
9.15 p.m.—Orchestral Concert.
9.45 p.m. (approx.)—Close Down.

BRESLAU (Germany)

923 kc/s (325 m.); 1.7 kW. Relayed by Gleiwitz, 1,157 kc/s (259 m.).
Transmits at intervals from 8.5 a.m.
7.0 p.m.—Weather for Farmers.
7.2 p.m.—Talk: The Constitution.
7.30 p.m.—Juan Manén Violin Recital. Sonata in B Flat Major (Mozart). Rondo et Badinerie (Bach-Manén). Gavotte célèbre (Martini-Manén). Ballet lento (Gluck-Manén). Arieta española—18th Century Melody

(Laserna-Manén). Two Selections (Manén): (a) Song, Op. 8a, (b) American Folk Dance, Turkey in the Straw.

8.30 p.m.—Discussion: Religion and Socialism.
9.10 p.m.—Time, Weather, News, Sports Notes and Programme Announcements.
9.30 p.m.—Talk on the Theatre.
9.45 p.m.—Answers to Correspondents on Technical Questions.
10.0 p.m. (approx.)—Silent Night.
BRNO (Czechoslovakia)
878 kc/s (342 m.); 3 kW.
Transmits at intervals from 10.15 a.m.
6.20 p.m.—Talk: The Life and Work of the Moravian Writer Jiri Mahen.
6.40 p.m.—Cabaret Concert.
8.0 p.m.—Concert from the Works of Novak.
9.0 p.m.—Programme from Prague.
9.15 p.m.—News, Theatre Review and Programme from Moravská-Ostrava.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1.2 kW.
Transmits at intervals from 5.0 p.m.
6.30 p.m.—Gramophone Concert.
7.30 p.m.—Le Journal Parle.
8.10 p.m.—Talk: The League of Nations and Political Problems.
8.15 p.m.—Concert. Overture, "Light Cavalry" (Suppé). Songs: (a) Cavatina from "Mireille" (Gounod), (b) Aubade from "Le Roi d'Ys" (Lalo), (c) Cavatina from "Prince Igor" (Borodin). Selection from "The Love Parade" (Schertzingler). Suite for Orchestra (Lacôme). Selection from "A Waltz Dream" (O. Strauss). Songs: Les Millions d'Arlequin (Drigo). Selection from "Rose Marie" (Friml). Divertissement for Clarinet (Marvet). 1930 (Nicholls). Selection from "Phi-Phi" (Christiné). In the interval at 9.0 p.m.—Topical Review.
10.15 p.m.—News Bulletin.

BRUSSELS (No. 2) (Belgium)

887 kc/s (338.2 m.); 12 kW.
7.30 p.m.—Talk on Holidays.
7.45 p.m.—Gramophone Records.
8.15 p.m.—Concert. Hungarian Overture (Kéler-Béla). Réverie du Soir (Saint-Saëns). Ave-Maria (Gounod). Introduction, Theme and Variations (Arband). Caucasian Sketches (Ippolitoff-Ivanoff). Six Songs. Selections from "Cavalleria Rusticana" (Mascagni). Nocturne and Miniature Serenade (Vandersmissen). Aria from "Martha" (Flotow). Hindu Song (Bemberg). Ballet égyptien (Luizini).

BUCHAREST (Romania)

Radio-bucarest. 761 kc/s (394 m.); 16 kW.
Transmits at intervals from 11.0 a.m.
6.35 p.m.—German Language Lesson.
7.0 p.m.—Chamber Music: Quartet (Dohnanyi).
7.30 p.m.—Talk (to be announced).
7.45 p.m.—Recitations by Mr. Stroici.
8.15 p.m.—Musical Sketch.
8.45 p.m.—News Bulletin.

BUDAPEST (Hungary)

545 kc/s (550 m.); 23 kW.
Transmits at intervals from 8.15 a.m.
6.0 p.m.—Recital of Japanese Folk Songs.
6.30 p.m.—Orchestral Concert, followed by Concert from the Café Ostende.

COLOGNE (Germany)

Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 1.7 kW.
See Langenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 1 kW. Relayed by Kalundborg, 260 kc/s (1,153 m.).
Transmits at intervals from 6.30 a.m.
2.35 p.m.—Instrumental Concert.
3.20 p.m. (in the interval)—Reading.
4.40 p.m.—Exchange: Fish Market Prices.
4.50 p.m.—Talk in Swedish.
5.20 p.m.—English Language Lesson.
5.50 p.m.—Weather and News.
6.15 p.m.—Time Signal.
6.16 p.m.—Talk (to be announced).
6.30 p.m.—Talk on Spectacles.
7.0 p.m.—Town Hall Chimes.
7.2 p.m.—The Caecilia Society's First Concert relayed from the Odd Fellows' Hall. "The Christmas Oratorio," for Soloists, Choir and Orchestra (Bach).
9.0 p.m.—News and Report of the Workers' Radio Society.
9.20 p.m.—Dance Music from the Hotel d'Angleterre.
11.0 p.m.—Town Hall Chimes; Close Down.

CORK (Ireland)

(6CK). 1,337 kc/s (225 m.); 1.5 kW.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.

CRACOW (Poland)

Polskie Radio. 1,229 kc/s (244 m.); 1.5 kW.
Transmits at intervals from 10.40 a.m.
7.0 p.m.—Review of New Books.
7.15 p.m.—Programme from Warsaw.
9.15 p.m.—Gramophone Records.
9.50 p.m.—News from Warsaw.
10.0 p.m.—Concert of Light Music.
11.0 p.m. (approx.)—Bugle Call from the Tower of St. Mary's Church.

DUBLIN (Ireland)

(2RN). 725 kc/s (413 m.); 1.5 kW.
1.30 p.m.—Time Signal, Weather, Stock Report and Gramophone Records.
6.0 p.m.—Gramophone Records.
6.15 p.m.—Programme for Children.
7.0 p.m.—Gramophone Records.
7.20 p.m.—News Bulletin.
7.30 p.m.—Time and Irish Lesson.
7.45 p.m.—Mrs. E. M. Burke: Recitations.
8.0 p.m.—Concert: "Mozart in Theatre and Temple." The Station Orchestra: Overture, "Don Juan." Robert Irwin (Baritone): Songs from "Don Juan." The Station Orchestra: Selection from "Cosi fan tutte." Robert Irwin: Recitative and Aria from "Cosi fan tutte." The Station Orchestra: Sacred Music. Renée Flynn (Soprano): Sacred Songs.
9.0 p.m.—Mary O'Hea and Company in a Sketch.
9.30 p.m.—Sponsored Programme.
10.30 p.m.—Time Signal, News, Weather and Close Down.

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.7 kW. Relayed by Cassel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.15 a.m.
6.5 p.m.—English Language Lesson.
6.30 p.m.—Talk: Autumn and Cider in Old Frankfurt and in Dialect Literature.
7.0 p.m.—Chamber Music—Unfamiliar Works by Mozart. Sonata for Organ, Two Violins and Bass. Soprano Solos: (a) Daphne, Deine Rosenwägen, (b) Geheime Liebe. Twelve Variations for Pianoforte on "Je suis Lindor"—Romance from Beaumarchais' "Barber of Seville." Quintet for Violin, Two Violas, Horn and Cello. Two Soprano Solos: (a) Komm, liebe Zither, with Mandoline accompaniment, (b) Gesellen-Reise. Serenade for Two Oboes, Two Clarinets, Two Horns and Two Bassoons.
8.0 p.m.—Report by Paul Laven: The Needs of Youth.
8.30 p.m.—Dancing Lesson.
9.10 p.m.—News, Sports Notes and Weather.
9.30 p.m.—Songs to the Lute.
10.0 p.m.—Dance Music from Berlin (Witzleben).
11.0 p.m. (approx.)—Close Down.

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.7 kW. Relayed by Bremen, 950 kc/s (315.8 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 530 kc/s (566 m.); and Kiel, 1,292 kc/s (232.2 m.).
Transmits at intervals from 5.20 a.m.
6.0 p.m.—See Königs Wusterhausen.
6.30 p.m.—(from Bremen)—Talk for Workers: What does the Worker read?
6.50 p.m.—Frankfurt Exchange and Hamburg Market Prices.
6.55 p.m.—Weather Report.
7.0 p.m.—(from Hanover)—Concert by the Hanoverian Teachers' Choral Society, relayed from the Town Hall. Cantata No. 80, "Ein feste Burg" (Bach). "King David"—Symphonic Psalm for a Speaking Voice, Soloists, Choir and Orchestra (Honegger).
8.40 p.m.—"Author and Automobile"—A Pneumatic Potpourri (Hans Harbeck).
9.30 p.m.—Weather, Political and Miscellaneous Announcements, Sports Notes and Local News.
10.0 p.m.—Concert relayed from the Ostermann Restaurant.

HILVERSUM (Holland)

1,004 kc/s (298.8 m.); 8.5 kW.
7.40—11.40 a.m.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.).
7.40 a.m.—Time and Gramophone Records.

9.40 a.m.—Time and Daily Service.
10.10 a.m.—Quintet Concert.
11.40 a.m.—Time Signal.
11.41 a.m.—Concert. Overture: "The Magic Flute" (Mozart). Ballet Music from "Rosamunde" (Schubert). Marche Militaire No. 1 (Schubert). Cello and Pianoforte Selections: (a) Gesangzene (Kaun), (b) Sicilienne (Faure). Overture, "The Barber of Seville" (Rossini). Saxophone Solo: Suite No. 1 from "L'Arlesienne" (Bizet). Hungarian March (Berlioz). Cello and Pianoforte Selections: (a) Aria (Hurf), (b) Cradle Song (Aubert), (c) Chanson napolitaine (Rabey). Overture, "Egmont" (Beethoven). Selection from "Kovanchina" (Moussorgsky). Waltz, Künstlerleben (Joh. Strauss).
1.40—2.0 p.m.—Interval.
2.10 p.m.—Organ Recital and Songs.
3.10 p.m.—Concert relayed from the Carlton Hotel, Amsterdam.
4.15 p.m.—Programme for Children.
5.10 p.m.—Military Band Concert.
6.40 p.m.—Gramophone Records.
7.10 p.m.—Weekly Book Talk.
7.40 p.m.—Time Signal.
7.41 p.m.—Choral and Orchestral Concert.

8.40 p.m.—Orchestral Concert. Overture, "Raymond" (Thomas). Waltz, Amoretentänze (Gangl). Serenade (Pierne). Soprano Solos. Selection from "La Traviata" (Verdi). International Waltz Potpourri (Robrecht). Selection from "Böhmische Musikanten" (Grün). Waltz, Flott durch's Leben (Translator). Selection from "A Waltz Dream" (O. Straus). Hoch und Deutschmeistermarsch (Erl).
10.40 p.m.—Gramophone Records.
11.40 p.m. (approx.)—Close Down.

HUIZEN (Holland)

160 kc/s (1,875 m.); 8.5 kW.
7.55 a.m. till Close Down.—Programme of the Christian Radio Society (N.C.R.V.).
7.55—9.10 a.m.—Morning Concert.
10.10 a.m.—Service for Hospitals.
10.40 a.m.—Reading by Miss Doyen.
11.10 a.m.—Gramophone Records.
11.40 a.m.—Police Notes.
12.10 p.m.—Organ Recital from a Church in Amsterdam.
1.25 p.m.—Gramophone Records.
1.40 p.m.—Programme for Schools.
2.15 p.m.—Gramophone Records.
2.55 p.m.—Dressmaking Lesson.
3.25 p.m.—Gramophone Records.
3.40 p.m.—Programme for Hospitals.
4.40 p.m.—Instrumental Concert.
6.10 p.m.—Home League Half-Hour, arranged by the Salvation Army. Address and Music.
6.40 p.m.—Lesson in Christian Philosophy.
7.25 p.m.—Police Notes.
7.40 p.m.—"Joshua"—Oratorio (Händel), by the Zaanstreek Christian Oratorio Society of Zaandam.

KALUNDBORG (Denmark)

Kalundborg Radio. 260 kc/s (1,153 m.); 10 kW.
See Copenhagen Programme.

KATOWICE (Poland)

Polskie Radio. 734 kc/s (408 m.); 16 kW.
Transmits at intervals from 10.40 a.m.
7.0 p.m.—Two Talks.
7.30 p.m.—Operetta Transmission.
9.0 p.m.—Talk (to be announced).
9.15 p.m.—Gramophone Records.
9.50 p.m.—Meteorological Report, Programme Announcements in French and News.
10.30 p.m.—Talk in English: Polish Literature in the Nineteenth Century.

KÖNIGSBERG (Germany)

Ostmarken Rundfunk. 1,085 kc/s (276 m.); 1.7 kW. Relayed by Danzig, 662 kc/s (453 m.).
Transmits at intervals from 5.30 a.m.
6.0 p.m.—(from Danzig)—Talk: What can the Public demand of a Lawyer?
6.25 p.m.—Weather Forecast.
6.30 p.m.—Evening Concert.
7.45 p.m.—Concert of Old Chamber Music on Historic Instruments, relayed from Königsberg University.
8.30 p.m.—Hermann Stehr reads his own Poems.
9.15 p.m.—Weather, News and Sports Notes.
9.30 p.m.—Concert of Light Music.
10.30 p.m. (approx.)—Close Down.

LAHTI (Finland)

167 kc/s (1,796 m.); 54 kW. Relayed by Helsingfors, 1,355 kc/s (221 m.).

Transmits at intervals from 10.0 a.m.
5.50 p.m.—Orchestral Concert.
6.30 p.m.—Talk by Prof. Klemetti.
7.0 p.m.—Pianoforte Recital.
7.25 p.m.—Orchestral Selections: Songs and Hungarian Dances (Leopold).
7.45 p.m.—News in Finnish and Swedish and Close Down.

LANGENBERG (Germany)

Westdeutscher Rundfunk, 635 kc/s (473 m.); 17 kW. Relayed by Aachen, Cologne, and Münster, 1,319 kc/s (227 m.).
Transmits at intervals from 5.45 a.m.
6.0 p.m.—Economic Notes, Weather and Sports Notes.
6.15 p.m.—Spanish Conversation.
6.40 p.m.—Talk: The International Unwrought Steel Corporation.
7.0 p.m.—Orchestral Concert of Viennese Music. Hoch-und Deutschmeister-Marsch (Jurek). Ballet Overture (Kremser). Waltz, Märchen aus Alt-Wien (Ziehrer). Song, Wien, du Märchen aus 1001 Nacht (Stolz). Viennese Waltz (Benatzky). Hallo! Hallo! Die grosse Eysler-Revue (Eysler). Interlude: "St. Martin"—Four Pictures from West German Folk Life after Old Rhymes by F. P. Kürten. Music by Gustav Kneip. Waltz, Die Schönbrunner (Lanner). Wiener Blut (Joh. Strauss). Dorf-schwalben aus Österreich (Jos. Strauss). Fesche Geister (Ed. Strauss). Wiener Bürger (Ziehrer). Balsirenen (Lehar).
8.0 p.m. (approx.)—News Bulletin. After the Concert, News, Sports Notes, and Concert from the Café Wien, Dortmund.
11.0 p.m. (approx.)—Close Down.

LEIPZIG (Germany)

Mitteldeutscher Rundfunk. 1,184 kc/s (253 m.); 2.3 kW. Relayed by Dresden, 941 kc/s (319 m.).
Transmits at intervals from 9.0 a.m.
6.15 p.m.—Military Band Concert.
7.15 p.m.—Choral Concert, relayed from the Schauburg Concert Hall, Chemnitz.
8.0 p.m.—"Luise Miller"—Wireless Drama after Schiller's "Kabale und Liebe" (Arranged by Dr. Carl Hagemann).
9.0 p.m.—Time, Weather, News and Sports Notes, followed by Concert of Light Music and Dance Items.
11.0 p.m. (approx.)—Close Down.

LJUBLJANA (Yugoslavia)

Radio Ljubljana. 522 kc/s (574.7 m.); 2.8 kW.
Transmits at intervals from 11.15 a.m.
6.30 p.m.—Talk on Health.
7.0 p.m.—Programme from Brno.
8.0 p.m.—Programme from Prague.
9.0 p.m.—Weather and News.

MADRID (Spain)

Union Radio (E.A.J. 7). 707 kc/s (424 m.); 2 kW.
Transmits at intervals from 11.45 a.m.
7.0 p.m.—Chimes, Exchange Quotations, Market Prices and Topical Review—Sport.
7.30 p.m.—Dance Music Programme.
8.15 p.m.—Bull-fighting Notes.
8.25 p.m.—News Bulletin.
8.30 p.m. (approx.)—Close Down.

MILAN (Italy)

Bnte Italiano Audizioni Radiofoniche. 590 kc/s (501 m.); 8.5 kW. Programme relayed by Turin, 1,098 kc/s (273.2 m.); and Genoa, 1,288 kc/s (381 m.).
Transmits at intervals from 7.15 a.m.
6.20 p.m.—Announcements and Report of the Royal Geographical Society.
6.30 p.m.—Concert of Light Music.
7.15 p.m.—Giornale radio; Weather.
7.30 p.m.—Time Signal.
7.32 p.m.—Dance Music Programme.
8.0 p.m.—Concert of Variety Music.
8.50 p.m.—Talk on Science.
9.0 p.m.—Symphony Concert. Overture, "Les Abencerages" (Cherubini). Concerto grosso for Strings (Corelli-Toni). "L'infedele," for Soprano and Orchestra (Clausetti). Topical Review. Scherzo, Nocturne and Country Dance from "A Midsummer Night's Dream" (Mendelssohn), followed by Dance Music from the Cova Restaurant.
10.0 p.m. (in an interval)—Giornale radio.
10.55 p.m.—News Bulletin.
11.0 p.m. (approx.)—Close Down.

MORAVSKÁ-OSTRAVA (Czechoslovakia)

1,739 kc/s (263 m.); 11 kW.
Transmits at intervals from 10 a.m.
6.20 p.m.—Programme from Brno.
8.0 p.m.—Programme from Prague.
9.15 p.m.—Programme Announcements and Theatre Review.
9.20 p.m.—Orchestral Concert.

Programmes for Monday—(Cont.)

MOTALA (Sweden)
222.5 kc/s (1,348 m.); 40 kW.
See *Stockholm* Programme.

MUNICH (Germany)
563 kc/s (533 m.); 1.7 kW.
Relayed by *Augsburg*, 536 kc/s (560 m.); *Kaiserslautern*, 1,112 kc/s (270 m.); and *Nürnberg*, 1,256 kc/s (239 m.).
Transmits at intervals from 5.45 a.m. to 6.0 p.m.—Technical Report—the Railway, the Sea, the Wireless, the Motorist and Topicalities.
6.30 p.m.—Talk on the following transmission.
6.35 p.m.—“*Salome*”—Drama in One Act (R. Strauss), relayed from the National Theatre.
8.15 p.m.—An Interview—Christel-marielle Schultes.
9.20 p.m.—Time, Weather, News and Sports Notes.

OSLO (Norway)
Kringkastingselskapet. 280 kc/s (1,071 m.); 75 kW. Relayed by *Fredrikstad*, 815 kc/s (368 m.); *Hamar*, 511 kc/s (587 m.); *Notodden*, 674 kc/s (445 m.); *Porsgrund*, 662 kc/s (453 m.); and *Rjukan*, 674 kc/s (445 m.).
Transmits at intervals from 10.10 a.m. to 6.15 p.m.—Weather and News.
6.30 p.m.—German Language Lesson.
7.0 p.m.—Time Signal.
7.2 p.m.—Talk: Civilisation in Norway about the Year-1800.
7.30 p.m.—Pianoforte Recital.
8.0 p.m.—Literary Review.
8.30 p.m.—Weather and News.
8.50 p.m.—Topical Talk.
9.5 p.m.—Concert of Chamber Music.

PARIS (France)
Eiffel Tower (FL). 207 kc/s (1,445 m.); 15 kW.
7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
5.45 p.m.—*Le Journal Parlé*.
7.10 p.m.—Meteorological Forecast.
7.20 p.m.—Concert. Selection from “*Ciboulette*” (Hahn-Salabert).
Paysage (Hahn-Mouton). D'une prison (Hahn-Mouton). Waltz, Gold and Silver (Lehár). Waltz from “*The Count of Luxemburg*” and Selection from “*Paganini*” (Lehár-Salabert). Selection from “*Véronique*,” and Selection

from “*La Basoche*” (Messenger-Delsaux). Selection from “*Iso-line*” (Messenger-Auvray). Chant Birman (Messenger-Salabert). At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)
Poste Parisien. 914 kc/s (329 m.); 1.2 kW.
8.45 p.m.—Gramophone Records, Talk and News.
9.0 p.m.—Concert. Overture, Jeanne, Jeannette et Jeanneton (Lacôme). Sous un ciel bleu (Hirschmann). Ballet Music from “*La petite Fonctionnaire*” (Messenger). Demande et réponse (Coleridge-Taylor). Selection from “*La Fête du Zamkoulouk*” (Grassi). Second Barcarolle for Pianoforte (Fauré). Selection from “*Madame l'Archiduc*” (Offenbach). Florentine Serenade (Moret). Selection from “*Le Pré aux clercs*” (Hérold). Staccato-valse (Godard). Selection from “*Guernica*” (Vidal).

PARIS (France)
Radio-Paris. (CFR). 174 kc/s (1,725 m.); 17 kW.
Transmits at intervals from 6.45 a.m. to 12.30 p.m.—Gramophone Concert. In the intervals at 1.0 p.m.—Exchange Quotations and News, and at 1.30 p.m.—Exchange Quotations.
2.0 p.m.—Exchange; Market Prices.
3.30 p.m.—Exchange Quotations.
3.45 p.m.—Gramophone Concert.
4.55 p.m.—News and Exchange Quotations.
6.0 p.m.—Agricultural Report and Racing Results.
6.25 p.m.—New York Exchange Rates.
6.30 p.m.—Gramophone Concert.
7.0 p.m.—Talk: The International Sanitary Organisation.
7.30 p.m.—Literary Reading: “*The Childhood of Anatole France*” (Paul Reboux).
7.45 p.m.—Commercial Prices, Economic and Social Notes and News.
8.0 p.m.—Historical Documents: “*The Return from the Island of Elba*” (arranged by René Arnaux), by M. Roger Monteaux and his Company.

8.30 p.m.—Sports Review.
8.45 p.m.—Concert. Quartet in A Minor (Schumann). Dialogue for Viola and Piano (Bouserez). Songs: (a) Farewell Song (Mozart), (b) Air (Issouire), (c) Reliques, and (d) Chanson (Rabaud). Quartet (Ravel). In the interval at 9.15 p.m.—Press Review, News and Time Signal.

POZNAŃ (Poland)
896 kc/s (335 m.); 1.9 kW.
Transmits at intervals from 6.15 a.m. to 7.0 p.m.—Talk by Stanislaw Wasylevsky.
7.15 p.m.—Soprano Song Recital.
7.30 p.m.—Programme from *Warsaw*.
9.0 p.m.—Time, News, Sports and Police Notes.
9.15 p.m.—Talk: On Board.
9.30 p.m. (approx.)—Close Down.

PRAGUE (Czechoslovakia)
Stranice. 617 kc/s (487 m.); 5.5 kW.
Transmits at intervals from 10.15 a.m. to 6.20 p.m.—Programme from *Bmo*.
8.0 p.m.—Recital of Norwegian and Jewish Songs.
8.30 p.m.—Concert by a Russian Orchestra.
9.0 p.m.—Time, News and Sports Notes.
9.15 p.m.—News, Theatre Notes and Programme Announcements.
10.0 p.m.—Time, News and Chimes.

RIGA (Latvia)
Radio Riga. 572 kc/s (525 m.); 13 kW.
Transmits at intervals from 10.0 a.m. to 5.30 p.m.—English Language Lesson.
6.0 p.m.—Meteorological Report.
6.3 p.m.—Chamber Music. Trio in D Minor (Arensky). Serenade (Braunfels). Selections (Grieg).
7.0 p.m.—News Bulletin.
7.30 p.m.—Songs and Flute Solos.
8.0 p.m.—Meteorological Report, followed by Orchestral Music.

ROME (Italy)
Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 75 kW. Relayed by *Naples*, 905 kc/s (332 m.); and *Prato Smeraldo*, 11,804 kc/s (25.4 m.).
Transmits at intervals from 7.15 a.m. to 6.45 p.m.—Giornale Radio, News, Sports Notes, Announcements and Press Review.
7.30 p.m.—Time Signal.
7.32 p.m.—Dance Music Programme.
8.5 p.m.—Concert of Light Vocal

and Instrumental Music, including a Short Comedy in Dialect.
9.55 p.m. (approx.)—News Bulletin.

STOCKHOLM (Sweden)
Radiotjänst (SASA). 689 kc/s (436 m.); 75 kW. Relayed by *Boden* 250 kc/s (1,200 m.); *Göteborg*, 932 kc/s (322 m.); *Höiby*, 1,166 kc/s (257 m.); *Motala*, 222.5 kc/s (1,348 m.); *Ostersund*, 389 kc/s (770 m.); *Sundsvall*, 554 kc/s (542 m.).
Transmits at intervals from 6.15 a.m. to 6.0 p.m.—Elementary English Lesson, relayed from *Jönköping*, 1,490 kc/s (202 m.).
6.30 p.m.—Choral Concert, relayed from *Habstad*, 1,391 kc/s (216 m.).
7.0 p.m.—Martinmas Goose Cabaret, relayed from *Malmö*, 1,301 kc/s (231 m.). Programme of Dialogues, Poetry and Songs.
7.45 p.m.—(from *Göteborg*).—Talk: Domestic Animals as Companions.
8.15 p.m.—Weather and News.
8.40 p.m.—“*A Dispute*”—A Sketch (Gustaf Collin).
9.5 p.m.—Concert of Light Music.
10.0 p.m. (approx.)—Close Down.

STUTTGART (Germany)
Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.7 kW. Relayed by *Freiburg*, 527 kc/s (570 m.).
Transmits at intervals from 5.15 a.m. to 6.0 p.m.—Time Signal.
6.5—10.0 p.m.—Programme from *Frankfurt*.
9.10 p.m. (in an interval).—Programme Announcements and News.
10.0 p.m.—Dance Music from *Berlin (Witzleben)*.
11.0 p.m. (approx.)—Close Down.

TOULOUSE (France)
Radiophonie du Midi. 779 kc/s (385 m.); 8 kW.
Transmits at intervals from 1.0 p.m. to 6.15 p.m.—Exchange Quotations.
6.30 p.m.—Dance Music Programme.
6.45 p.m.—Market Prices.
6.55 p.m.—Selections by an Argentine Orchestra.
7.30 p.m.—News Bulletin.
7.45 p.m.—Mandoline Solos.
8.0 p.m.—Concert of Operetta Music.
8.25 p.m.—Gramophone Concert.
8.55 p.m.—Fashion Notes.
9.0 p.m.—Time Signal.
9.2 p.m.—Variety Concert.
10.0 p.m.—Military Band Music.
10.15 p.m.—North African News.
10.30 p.m.—Concert of Light Music.

11.0 p.m.—Concert. *La Lettre de Manon* (Gillet). Selection from “*Die Fledermaus*” (Strauss). Golliwogg's Cake-Walk from “*Children's Corner*” (Debussy).
11.15 p.m.—Accordion Solos.
11.30 p.m.—Concert by a Viennese Orchestra.
12 midnight.—News and Close Down.

VIENNA (Austria)
Radio-Wien. 581 kc/s (516.3 m.); 20 kW. Relayed by *Graz*, 851 kc/s (352.5 m.); *Innsbruck*, 1,058 kc/s (283.5 m.); *Klagenfurt*, 662 kc/s (453.2 m.); and *Linz*, 1,220 kc/s (245.9 m.).
Transmits at intervals from 6.0 a.m. to 6.0 p.m.—Letters of Artists—French Painters of the Nineteenth Century—Delacroix and his Circle.
6.30 p.m.—Time, Weather and Programme Announcements.
6.35 p.m.—Humorous Recital by Dr. Josef Bergauer: Popular Viennese Types. Rudolf Wallner at the Pianoforte.
7.0 p.m.—Violin Recital relayed from the Konzerthausaal. *La Folia* (Corelli). *Fantasia in C Major*, Op. 159 (Schubert). Violin Concerto No. 5 in A Minor, in One Movement (Vieuxtemps).
8.0 p.m.—Concert by the *Vienna Symphony Orchestra*. Overture, “*Die Weihe des Hauses*,” Op. 124 (Beethoven). Concerto for Flute and Harp (Mozart). Symphony No. 3—Eroica, in E Flat Major, Op. 55 (Beethoven).
9.30 p.m.—News Bulletin, followed by Gramophone Records.

WARSAW (Poland)
Polskie Radio. 212 kc/s (1,411 m.); 14 kW.
Transmits at intervals from 10.40 a.m. to 6.25 p.m.—Gramophone Records.
6.35 p.m.—Radio Journal.
6.55 p.m.—Gramophone Records.
7.0 p.m.—Review of New Books.
7.15 p.m.—Talk: The Literature of Music.
7.30 p.m.—“*Gipsy Love*”—Operetta (Lehár). In the interval, Programme Announcements and Theatre Review.
9.0 p.m.—Talk: Americans in Poland.
9.15 p.m.—Gramophone Records.
9.50 p.m.—Weather, Police and Sports Notes.
10.0 p.m.—Dance Music Programme.
11.0 p.m. (approx.)—Close Down.

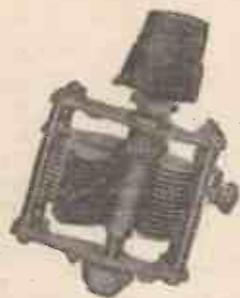
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24 PAGE CATALOGUE—FREE

PROGRAMMES FOR TUESDAY (November 11)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

ALGIERS (N. Africa)

8.25 kcs (363.4 m.); 13 kW. Transmits at intervals from 12.30 p.m. 7.40 p.m.—News Bulletin. 7.30 p.m.—Recital of Songs. 8.0 p.m.—Press Review. 8.15 p.m.—Viennese Music, Military Music and Songs from Operettas. 9.0 p.m.—Concert of Oriental Music.

BARCELONA (Spain)

Radio-Barcelona (EAJ), 360 kc/s (349 m.); 8 kW. Transmits at intervals from 8.0 a.m. 6.0 p.m.—Trio Music and News. 7.0 p.m.—Gramophone Records. 8.30 p.m.—Elementary English Lesson. 9.0 p.m.—Chimes, Weather, Exchange and Part Relay of an Opera from El Gran Teatro del Liceo, Barcelona. News in the interval. 12 midnight (approx.)—Close Down.

BERLIN (Germany)

Königs Wusterhausen 183 kc/s (1,635 m.); 35 kW. Transmits at intervals from 5.25 a.m. 3.30 p.m.—Programme from Leipzig. 4.30 p.m.—Talk: An Introduction to the Understanding of Modern Music. 5.0 p.m.—Talk: Pictures as Educational Factors. 5.30 p.m.—Educational Talk: Modern Philosophy. 6.0 p.m.—Elementary French Lesson. 6.30 p.m.—Talk: Syndicate Policy in Times of Crisis. 6.55 p.m.—Weather for Farmers. 7.0 p.m.—Light Concert from the Hotel Kaiserhof. 7.25 p.m.—Programme from Munich. 8.30 p.m.—Programme from Leipzig. 9.30 p.m.—Programme from Berlin (Witzleben). 11.30 p.m. (approx.)—Close Down.

BERLIN (Germany)

Witzleben. 716 kc/s (418 m.); 4.7 kW. Transmits at intervals from 6.0 a.m. 5.55 p.m.—Labour Market Report. 6.0 p.m.—Dance Music, with Vocal Refrains. 7.30 p.m.—Josef Ponten reads from his own works—A Relay from the Herrenhaus, organised by the Society of German Narrative Writers. 8.0 p.m.—News; Sports Notes. 8.10 p.m.—A Selection from "Frau im Stein"—Opera (James Simon). 9.30 p.m.—Political Press Review, followed by Weather, News, Sports Notes and Report on the Six Days' Racing.

BERNE (Switzerland)

Radio-Bern. 743 kc/s (403 m.); 1.1 kW. Transmits at intervals from 11.43 a.m. 6.28 p.m.—Time and Weather. 6.30 p.m.—Talk: Johannes Kepler, on the 300th Anniversary of his Death. 7.0 p.m.—Balalaika Concert of Russian Folk Music relayed from Geneva, 305 kc/s (760 m.). 7.30 p.m.—Marches and Dance Music. 8.0 p.m.—News and Weather. 8.15 p.m.—"The Wicked Neighbour"—Musical Play (Klerf). 9.15 p.m.—Orchestral Concert. 9.45 p.m. (approx.)—Close Down.

BRESLAU (Germany)

923 kc/s (325 m.); 1.7 kW. Relay by Gleiwitz, 1,157 kc/s (259 m.). Transmits at intervals from 10.15 a.m. 6.2 p.m.—"When Grandpapa asked Grandmama"—Gramophone Concert. 7.0 p.m.—Weather for Farmers. 7.2 p.m.—Talk: The Constitution. 7.30 p.m.—Concert by the Comedian Harmonists, relayed from the Concert Hall, Breslau. In the intervals, Gramophone Records. 8.45 p.m.—Richard Huelsenbeck reads from his own novel, "China devours Men". 9.30 p.m.—See Berlin (Witzleben). 9.40 p.m.—Time, Weather, News, Sports Notes and Programme Announcements. 10.0 p.m.—Report of the Silesian Amateur Wireless Society. 10.5 p.m. (approx.)—Silent Night.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1.2 kW. Transmits at intervals from 5.0 p.m. 6.30 p.m.—Trio Concert. 7.30 p.m.—Le Journal Parlé. 8.10 p.m.—Talk: The League of Nations and National Safety. 8.15 p.m.—Concert on the Twelfth Anniversary of Armistice, relayed

from Antwerp. In the interval, Talk: Belgium's Contribution to Mechanics since 1830, and Topical Review. 10.10 p.m.—Relay from the Menin Gate at Ypres of the Ceremony arranged by the Committee of the Last Post—Sounding of the Last Post and the Réveille. 10.25 p.m.—News Bulletin. At 8.15 p.m. (on 338.2 m.)—Concert arranged by the Flemish Socialist Radio Club of Antwerp (SAROV).

BUCHAREST (Romania)

Radio Bucarest. 761 kc/s (394 m.); 16 kW. Transmits at intervals from 11.0 a.m. 7.0 p.m.—Orchestral Selections. Overture, "The Thieving Magpie" (Rossini). Second Suite from "Peer Gynt" (Grieg). 7.30 p.m.—Talk (to be announced). 7.45 p.m.—Recital of Songs. 8.15 p.m.—Orchestral Selections. Bells across the Meadows (Ketebej). Selections from "The Duchess of Chicago" (Kálmán). Waltz, Nouvelles de Vienne (Translatour). 8.45 p.m.—News Bulletin.

BUDAPEST (Hungary)

545 kc/s (550 m.); 23 kW. Transmits at intervals from 8.15 a.m. 5.45 p.m.—French Language Lesson. 6.20 p.m.—The Letter Box. 7.0 p.m.—Cabaret Programme. 8.30 p.m.—Pianoforte Duets, followed by Concert by a Tzigane Orchestra from the Café Baross. 8.45 p.m.—News Bulletin.

COLOGNE (Germany)

Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 1.7 kW. See Langenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 1 kW. Relay by Kalundborg, 260 kc/s (1,153 m.). Transmits at intervals from 6.30 a.m. 2.0 p.m.—Vocal and Instrumental Concert. 4.0 p.m.—Programme for Children. 4.40 p.m.—Exchange; Fish Market Prices. 4.50 p.m.—Talk: Olaf Hansen (from the Aarhus Studio). 5.20 p.m.—German Language Lesson. 5.50 p.m.—Weather and News. 6.15 p.m.—Time Signal. 6.30 p.m.—Talk: The Care of Children in Denmark—Support and Supervision of Orphans. 7.0 p.m.—Town Hall Chimes. 7.2 p.m.—Concert of French Operetta Music. Overture, "Deux vieilles gardes" (Delibes). Selection from "Miss Decima" (Audran). Entrance from "Galante Aventure" (Guiraud). Selection from "Mars-selle Nitouche" (Hervé). Aria from "Phi-Phi" (Christine). Selection from "Un bon garçon" (Yvain). Selection from "Trois jeunes filles nues" (Moretti). Overture, "La petite Bohème" (Hirschmann). 8.0 p.m.—Reading (Rude). 8.30 p.m.—Violin Recital. Suite (Leclair). Minuet (Rousseau). Two Selections (Mandonville): (a) The Hunt, (b) Tambourin. 8.50 p.m.—News and Report of the Danish Radio Clubs. 9.10 p.m.—Concert of Symphonic Jazz Music. 10.0 p.m. (approx.)—Close Down.

CORK (Ireland)

(6CK). 1,337 kc/s (225 m.); 1.5 kW. 1.30 p.m.—Weather Forecast and Gramophone Selections. 6.0 p.m.—Exchange, News Bulletin and Gramophone Records. 6.15 p.m.—Programme from Dublin.

CRACOW (Poland)

Polskie Radio. 1,229 kc/s (244 m.); 1.5 kW. Transmits at intervals from 9.15 a.m. 6.30 p.m.—Gramophone Records. 6.40 p.m.—Programme from Warsaw, followed by News and Relay of Foreign Stations.

DUBLIN (Ireland)

(2RN). 725 kc/s (413 m.); 1.5 kW. 1.30 p.m.—Time Signal, Weather, Stock Report and Gramophone Concert. 6.0 p.m.—Gramophone Records. 6.15 p.m.—Programme for Children. 7.0 p.m.—Gramophone Records. 7.20 p.m.—News Bulletin. 7.30 p.m.—Time and Leigheacht Gaedhilge. 7.45 p.m.—Monologues by Frances Moynagh. 8.0 p.m.—Concert. The Station String Quartet; Quartet (Haydn). The Station Orchestra: Overture and Dances from "Nell Gwynn" (German). Edie O'Dwyer

(Soprano): Songs (German). Talk: Greek Folklore. Annie Fagan (Harp).

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.7 kW. Relay by Cassel, 1,220 kc/s (246 m.). Transmits at intervals from 5.15 a.m. 6.0 p.m.—Time, Weather and Economic Notes. 6.5—9.0 p.m.—Programme from Stuttgart. 9.0 p.m.—News, Sports Notes and Weather Report.

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.7 kW. Relay by Bremen, 950 kc/s (315.8 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 530 kc/s (566 m.); and Kiel, 1,292 kc/s (232.2 m.). Transmits at intervals from 5.20 a.m. 6.25 p.m.—Talk: The Third Conquest of America. 6.50 p.m.—Frankfurt Exchange and Hamburg Egg Market Prices. 6.55 p.m.—Weather Report. 7.0 p.m.—"From Various Districts of Germany"—Orchestral Concert. March, Elbtalgruss (Fucks). Waltz, Im schönen grünen Holstenland (Petras). The Mill, in the Black Forest (Eilenberg). Potpourri of Rhenish Songs, So singt man am Rhein (Haseloff). Waltz, Münchener Kindl (Komzak). Heligoland March (Möckel). 8.0 p.m.—Famous Germans of the Hanseatic Towns—General von Steuben—a German-American Suite (Kurt Siemers). 9.0 p.m.—Weather, Political and Miscellaneous Announcements, Sports Notes and Local News. 9.20 p.m. (from Hanover). Concert from the Café Continental. 10.30 p.m.—Café Wallhof Concert. 11.30 p.m.—(Hamburg only). Orchestral Concert of Dance Music.

HILVERSUM (Holland)

1,004 kc/s (298.8 m.); 8.5 kW. 7.40 a.m.—11.40 p.m.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.). 7.40 a.m.—Time and Gramophone Records. 9.40 a.m.—Time and Daily Service. 10.10 a.m.—Quintet Concert. March, Treue un treue (Blankenburg). Waltz, La belle Lolita (Morena). Hymn of Love (Metra). Spanish Waltz, La Serenata (Metra). Tango, Señorita (Grit). Selection from "Rip Rip" (Planquette). Selection from "Der Geist des Wojwodens" (Grossmann). Waltz, Das Lied ist aus (Stolz). Wiener Spaziergange (Komzak). The Polar Bears come back (Wright). Minuet from "Samson" (Händel). March, Uncle Sammy (Holzmann). 11.40 a.m.—Time Signal. 11.41 a.m.—Concert relayed from the Tuschinski Theatre, Amsterdam. 1.40 p.m.—Talk for Women. 2.10—2.40 p.m.—Interval. 2.40 p.m.—Dressmaking Lesson: Cutting Patterns. 3.40 p.m.—Gramophone Records. 4.10 p.m.—Pianoforte Recital with Introductory Talk. 4.40 p.m.—Concert by a Children's Choir. 5.10 p.m.—Concert relayed from the Rembrandt Theatre, Amsterdam. 6.40 p.m.—English Language Lesson. 7.10 p.m.—Talk (to be announced). 7.40 p.m.—Time Signal. 7.41 p.m.—"Zapiski Zmizeleho"—The Day-book of One who vanished, for Tenor, Contralto, and Three Women's Voices, with Pianoforte accompaniment (Janacek).

LANGENBERG (Germany)

Westdeutscher Rundfunk. 635 kc/s (473 m.); 17 kW. Relay by Aachen, Cologne, and Münster, 1,319 kc/s (227 m.). Transmits at intervals from 5.45 a.m. 6.0 p.m.—Economic Notes, Weather and Sports Notes. 6.15 p.m.—French Conversation. 6.40 p.m.—Talk: What is an Accident according to the State Insurance Regulations? 7.0 p.m.—Masters of Operetta—Gramophone Records. 7.45 p.m.—News Bulletin. 8.0 p.m.—"Looking for a Wife"—An improbable Occurrence (Nicolai Gogol). German Translation by Luise Flachs-Folschaneau. After the Play, News, Sports Notes and Silent Night.

LEIPZIG (Germany)

Mitteldeutscher Rundfunk. 1,184 kc/s (253 m.); 2.9 kW. Relay by Dresden, 941 kc/s (310 m.). Transmits at intervals from 9.0 a.m. 3.30 p.m.—Orchestral Concert. Overture, "Hermann und Dorothea" (Schumann). Concert Piece for Violin and Orchestra (Schubert). Entr'acte Music from "Die drei Pintos" (Weber). Violin Concerto No. 8 (Spohr). Overture, "The Templar and the Jewess" (Marschner). 4.55 p.m.—Economic Notes, Weather and Time. 5.5 p.m.—Programme for Women. 5.30 p.m.—French Conversation.

LIJUBLJANA (Yugoslavia)

Radio-Ljubljana. 522 kc/s (574.7 m.); 2.8 kW. Transmits at intervals from 11.15 a.m. 6.30 p.m.—Talk on Weather. 7.0 p.m.—Programme (to be announced) relayed from Zagreb, 977 kc/s (307 m.). 9.30 p.m.—Weather, News and Gramophone Records.

MADRID (Spain)

Union Radio (EAJ7). 707 kc/s (424 m.); 2 kW. Transmits at intervals from 8.0 a.m. 7.0 p.m.—Chimes, Exchange Quotations, Market Prices and Review of Literature and Art. 7.30 p.m.—Dance Music Programme. 8.25 p.m.—News Bulletin. 8.30—9.45 p.m.—Interval. 9.45 p.m.—Lesson in English Pronunciation. 10.0 p.m.—Chimes, Time and Exchange Quotations. 10.10 p.m. (approx.)—First Lecture Recital on Contemporary Spanish Composers—Manuel de Falla. Four Pieces for Pianoforte: (a) Andaluza, (b) Montañesa, (c) Cubana, (d) Aragonesa. Soprano Solos: Three Melodies to Verse by Th. Gautier: (a) Les colombes, (b) Chinoseril, (c) Seguidilla. Pianoforte Solo: Fantasia bética. Mezzo-Soprano Solos: Six Popular Spanish Songs: (a) Seguidilla murciana, (b) El paño moruno, (c) Asturiana, (d) Jota, (e) Nana, (f) Canción, (g) Polo. Song to Verse by S. Jean-Aubry for Soprano and Orchestra: Psyché. Concerto for Piano and Small Orchestra. 12 midnight—Chimes, News and Dance Music. 12.30 a.m. (Wednesday)—Close Down.

MILAN (Italy)

Ente Italiano Audizioni Radiofoniche. 599 kc/s (501 m.); 8.5 kW. Programme relayed by Turin, 1,098 kc/s (273.2 m.); and Genoa, 788 kc/s (381 m.). Transmits at intervals from 7.15 a.m. 6.20 p.m.—Announcements. 6.30 p.m.—Relay of Music from the Fiaschetta Toscana. 7.15 p.m.—Giornale Radio and Weather. 7.30 p.m.—Time Signal. 7.32 p.m.—Dance Music Programme. 8.0 p.m.—"Turandot"—Opera (Puccini), relayed from the Politcaia Chiarella, Turin. In the interval, Talk and Scientific Notes. After the Opera, Dance Music relayed from the Cova Restaurant. 10.0 p.m. (in the interval)—Giornale Radio. 10.55 p.m.—News Bulletin. 11.0 p.m. (approx.)—Close Down.

MOTALA (Sweden)

222.5 kc/s (1,348 m.); 40 kW. See Stockholm Programme.

MUNICH (Germany)

563 kc/s (533 m.); 1.7 kW. Relay by Augsburg, 536 kc/s (560 m.); Kaiserslautern, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (239 m.). Transmits at intervals from 5.45 a.m. 6.0 p.m.—Talk for Workers. 6.30 p.m.—Choral Concert. 7.0 p.m.—Talk: Sports Competitions. 7.25 p.m.—Orchestral Concert. Overture to a Puppet Play (Gal). Scherzo from "A Midsummer Night's Dream" (Mendelssohn). Serenade (Rachmaninoff). Valse Fantasia (Glinka). Solovje's Song (Grieg). Italian Caprice (Tchaikovsky). 8.40 p.m.—An Interview. 9.0 p.m.—Organ Recital. Three Little Pieces (A. Pechler): (a) Choral Prelude, Gegrüßet seist du, Königin, Op. 13, No. 2, (b) Pastorale, Op. 16, No. 1, (c) Intrade, Op. 17, No. 1. Fantasia and Fugue in E minor (Manasse). 9.20 p.m.—Time, Weather News and Sports Notes.

OSLO (Norway)

Kringkastingselskapet. 280 kc/s (1,071 m.); 75 kW. Relay by Fredrikstad, 815 kc/s (368 m.); Hamar, 511 kc/s (587 m.); Notodden, 674 kc/s (445 m.); Porsgrund,

OSLO (Norway)

1.40 p.m.—Programme for Women. 2.40 p.m.—Dressmaking Lesson. 3.10 p.m.—Programme to be announced. 4.40 p.m.—Gramophone Records. 6.10 p.m.—Talk arranged by the Universal Workers' Association. 6.25 p.m.—Lesson in Writing. 6.55 p.m.—Talk: Electricity—What it costs to produce, and what we pay for it. 7.25 p.m.—Police Notes. 7.40—11.40 p.m.—Propaganda Evening on the occasion of the Fifth Anniversary of the Catholic Radio Society. 7.40 p.m.—Orchestral Concert. Overture, "Raymond" (Thomas). Solvège's Song (Grieg). Hungarian Rhapsody, No. 14 (Liszt). Waltz from "Der Rosenkavalier" (R. Strauss). Andante from the String Quartet, Op. 11 (Tchaikovsky). Overture, "The Merry Wives of Windsor" (Nicolai). 8.35 p.m.—Concert of Popular Music. 9.0 p.m.—News Bulletin. 9.10 p.m.—The Propaganda Revue. 10.40 p.m.—Humorous Programme by a Male Voice Choir. 11.10 p.m.—Sextet Concert. 11.40 p.m. (approx.)—Close Down.

Programmes for Tuesday—(Cont.)

66.2 kc/s (453 m.); and *Rjukan*, 67.4 kc/s (445 m.).
 Transmits at intervals from 10.10 a.m.
 6.15 p.m.—Weather and News.
 6.30 p.m.—English Language Lesson.
 7.0 p.m.—Time Signal.
 7.2 p.m.—“The White Château”—Play (Reginald Berkeley). Music by Norman O'Neill. In the intervals at 8.30 p.m.—Weather and News, and at 8.50 p.m.—Topical Talk.
PARIS (France)
 Eiffel Tower (FL). 207 kc/s (1,445 m.); 15 kW.
 7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
 9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
 6.0 p.m.—First Transmission from *Strasbourg*, 869 kc/s (346 m.), relayed by all French Government Stations.
 7.25 p.m.—Meteorological Forecast.
 7.35 p.m.—Concert dedicated to *Musicians who fell during the Great War*. Cello Solo: *Intermezzo* from “*Goyescas*” (Granados). Spanish Dances for Pianoforte (Granados). Recitations: (a) *De Profundis* (Jean Marc Bernard), (b) *Prière dans les tranchées* (Sylvan Royé). Two Pieces for Pianoforte (Krieger). Selection for Cello and Pianoforte: *En Espagne* (Joseph Boulnois). Recitation: *J'ai des rendez-vous avec la mort* (Alan Soeger). Pianoforte Solo: *Promenades* (Albéric Magnard). Recitation: *Heureux ceux qui sont morts* (Charles Péguy). Trio for Violin, Cello and Pianoforte (Boulnois). *Marche héroïque*—in memory of Henri Regnault (Saint-Saëns). At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
 10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).
PARIS (France)
 Poste Parisien. 914 kc/s (329 m.); 1.2 kW.
 9.0 a.m.—Transmission of Pictures.
 8.45 p.m.—Gramophone Records, Talk and News Bulletin.
 9.0 p.m.—Concert. *Andromaque au tombeau d'Hector* (Berlioz). *Prelude and Song* from “*L'attaque du moulin*” (Bruneau). Ballet Music from the Second Part of “*Patric*” (Faladilhe). *Scènes alsaciennes* (Massenet). International Suite

(Tchaikovsky). *Les mendiants de la gloire* (Honegger). *Marche militaire* from the *Suite algérienne* (Saint-Saëns).
PARIS (France)
 Radio-Paris. (CFR). 174 kc/s (1,725 m.); 17 kW.
 Transmits at intervals from 8.0 a.m.
 12.30 p.m.—Gramophone Concert. In the intervals, News.
 3.45 p.m.—Gramophone Concert.
 4.55 p.m.—News Bulletin.
 6.0 p.m.—Agricultural Report and Racing Results.
 6.25 p.m.—New York Exchange Rates.
 6.30 p.m.—Gramophone Records.
 7.0 p.m.—Readings from the Works of War Authors.
 7.45 p.m.—Economic and Social Notes and News.
 8.0 p.m.—Scenes from “*The Unknown Warrior*”—Play (Raynal). In the interval at 8.30 p.m.—Sports Review.
 9.15 p.m.—Press Review, News and Time Signal.
 9.30 p.m.—Concert. Songs: (a) *Aria* from “*La fille de Roland*” (Rabaud), (b) *Hymne à la France* (Busser). *Sinfonia eroica* (Beethoven).
POZNAN (Poland)
 896 kc/s (335 m.); 1.9 kW.
 Transmits at intervals from 6.0 a.m.
 6.50 p.m.—Opera Transmission. In the intervals, Theatre Notes and Programme Announcements.
 9.45 p.m.—Time, News, Sports and Police Notes.
 10.0 p.m.—Dance Music from the *Café Esplanade*.
 11.0 p.m. (approx.)—Close Down.
PRAGUE (Czechoslovakia)
 Stranice. 617 kc/s (487 m.); 5.5 kW.
 Transmits at intervals from 10.15 a.m.
 7.0 p.m.—Orchestral Concert.
 7.10 p.m.—Concert of Sacred Music relayed from the Town Hall.
 9.0 p.m.—Time, News and Sports Notes.
 9.15 p.m.—News, Theatre Notes and Programme Notes.
 9.20 p.m.—Concert relayed from the Automobile Club.
 10.0 p.m.—Time and Chimes
RIGA (Latvia)
 Radio Riga. 572 kc/s (525 m.); 13 kW.

Transmits at intervals from 10.0 a.m.
 6.0 p.m.—Orchestral Concert.
 7.0 p.m.—News Bulletin.
 7.20 p.m.—Song Recital. In the interval at 8.0 p.m.—Meteorological Report and News.
ROME (Italy)
 Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 75 kW. Relayed by *Naples*, 905 kc/s (332 m.); and *Prato Smeraldo*, 11,804 kc/s (25.4 m.).
 Transmits at intervals from 7.15 a.m.
 6.50 p.m.—Giornale Radio, News and Sports Notes.
 7.0 p.m.—Announcements, Press Review and News.
 7.30 p.m.—Time Signal.
 7.32 p.m.—Dance Music Programme.
 8.5 p.m.—Concert by the *Rome Quartet*. Quartet in E Minor, Op. 59, No. 2 (Beethoven). *Soprano Solos*: (a) *Aria* from “*La sonnambula*” (Bellini), (b) *Aria* from “*Il Guarany*” (Gomes). *Harp Solos*: (a) *Sonata* (Scarlatti), (b) *Minuet* (Alfano), (c) *Le jardin mouillé* (de la Presle). *Soprano Solo* from “*Mignon*” (Thomas). *Quartet Selections*: (a) *Oriente*, (b) *A Pespagnole* (Glazounoff). “*The Two Opinions*”—Sketch in One Act (Giuseppe Baffico). *Intermezzo* from “*Manon Lescaut*” (Puccini). Selection from “*Le maschere*” (Mascagni).
 9.55 p.m. (approx.)—Close Down.
SCHENECTADY (U.S.A.)
 General Electric Company (WGY). 790 kc/s (379.5 m.); 50 kW.
 Relayed at intervals by *W2XAF* on 9,530 kc/s (31.48 m.), and by *W2XAD* on 15,340 kc/s (19.56 m.).
 Transmits at intervals from 11.45 a.m.
 11.30 p.m.—Green Room Orchestra.
 11.45 p.m.—New York Relay.
 12 midnight.—Weather Forecast.
 12.1 a.m. (Wednesday)—American Trio.
 12.14 a.m.—Time Signal.
 12.15 a.m.—Smith Brothers’ Programme.
 12.30 a.m.—New York Relay.
 1.0 a.m.—McManus and Riley Programme.
 1.15 a.m.—“Studio Classics.”
 1.30 a.m.—Programme from *New York*.
 3.15 a.m.—“Kaleidoscope.”
 4.0 a.m.—Doc Peyton and the Kenmore Hotel Orchestra, from *Albany*, N.Y.

4.30 a.m.—Organ Recital from Proctor’s Theatre.
 5.0 a.m.—Doc Peyton and the Kenmore Hotel Orchestra.
 5.30 a.m. (approx.)—Close Down.
STOCKHOLM (Sweden)
 Radiotjänst (SASA). 689 kc/s (436 m.); 75 kW. Relayed by *Boden*, 250 kc/s (1,200 m.); *Göteborg*, 932 kc/s (322 m.); *Hörby*, 1,166 kc/s (257 m.); *Motala*, 222.5 kc/s (1,348 m.); *Östersund*, 380 kc/s (770 m.); *Sundsvall*, 554 kc/s (542 m.).
 Transmits at intervals from 6.15 a.m.
 6.0 p.m.—Talk: *Volcanoes and Earthquakes*.
 6.30 p.m.—Vocal Quartet Concert.
 7.0 p.m.—Address by Archbishop *Söderblom* in connection with *Armistice Day*: *Is the Idea of Peace an Illusion?*
 7.30 p.m.—Song Recital by *Ossian Frumerie*.
 7.55 p.m.—Talk: *The 1930 Census*.
 8.40 p.m.—Literary Review.
 9.10 p.m.—Recital from the Works of *Kurt Thomas*. *Sonata in C Major for Pianoforte*, Op. 13, *Sonata in A Minor for Flute and Pianoforte*, Op. 11.
 10.0 p.m. (approx.)—Close Down.
STRASBOURG (France)
 Radio-Strasbourg (PIT). 869 kc/s (346 m.); 15 kW.
 6.0 p.m.—Identification Signal.
 6.15 p.m.—“*Requiem*” for Soloists, Choir and Orchestra (Mozart).
 7.30 p.m. (approx.)—Close Down.
STUTTGART (Germany)
 Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.7 kW. Relayed by *Freiburg*, 527 kc/s (570 m.).
 Transmits at intervals from 5.15 a.m.
 6.5 p.m.—(from *Mannheim*): Talk: *The Crisis in Wireless Listening*.
 6.30 p.m.—Concert of Arias and Operetta Songs.
 7.15 p.m.—“*Narcotics*”—A Scene (Tristan Bernard).
 8.0 p.m.—“*Ambition in the Kitchen*”—One Act Comic Opera (Ary van Leeuwen, after Lortzing).
 9.0 p.m.—Programme Announcements, News and Silent Night for Distant Reception.
TOULOUSE (France)
 Radiophonie du Midi. 779 kc/s (385 m.); 8 kW.
 Transmits at intervals from 1.0 p.m.
 6.15 p.m.—Exchange Quotations.

6.30 p.m.—Dance Music Programme.
 6.45 p.m.—Market Prices.
 6.55 p.m.—Recital of Spanish Songs.
 7.30 p.m.—News Bulletin.
 7.45 p.m.—Hawaiian Guitar Selections.
 8.0 p.m.—Concert of Military Band Music.
 8.30 p.m.—Gramophone Records.
 8.55 p.m.—Fashion Notes.
 9.0 p.m.—Time Signal.
 9.2 p.m.—Concert of *Opera Music*. Selections from “*La Tosca*” (Puccini), “*La Traviata*” (Verdi), “*La Bohème*” (Puccini), “*Cavalleria Rusticana*” (Mascagni), “*Mignon*” (Thomas), “*The Fair Maid of Perth*” (Bizet), “*Sappho*” (Massenet), “*Madame Butterfly*” (Puccini), and “*Lakmé*” (Delibes).
 10.0 p.m.—Relay from the *Café Sion*.
 11.0 p.m.—North African News.
 11.10 p.m.—Recital of Songs.
 11.30 p.m.—Concert by a Viennese Orchestra.
 12 midnight.—News and Close Down.
VIENNA (Austria)
 Radio-Wien. 581 kc/s (516.3 m.); 20 kW. Relayed by *Graz*, 851 kc/s (352.5 m.); *Innsbruck*, 1,058 kc/s (283.5 m.); *Klagenfurt*, 662 kc/s (453.2 m.); and *Linz*, 1,220 kc/s (245.9 m.).
 Transmits at intervals from 8.20 a.m.
 6.0 p.m.—Elementary English Lesson.
 6.30 p.m.—Time, Weather and Programme Announcements.
 6.35 p.m.—Orchestral Concert.
 7.30 p.m.—Talk: *Indian Art*—the *Miniature Treasures of the Great Moguls* in Vienna.
 8.0 p.m.—Georges Baklanoff Recital.
 8.35 p.m.—News Bulletin.
 8.40 p.m.—String Quartet Music. String Quartet, Op. 2, No. 5 in D Major and String Quartet, Op. 20, No. 5 in F Minor (Haydn).
 9.40 p.m.—Gramophone Concert of Viennese Music.
WARSAW (Poland)
 Polskie Radio. 212 kc/s (1,411 m.); 14 kW.
 Transmits at intervals from 9.15 a.m.
 6.5 p.m.—Gramophone Records.
 6.15 p.m.—Talk by General Kutrzeba.
 6.30 p.m.—Gramophone Records.
 6.40 p.m.—Literary Programme.
 7.0 p.m.—Opera Relay. In the interval, Programme Announcements and Theatre Review. After the Programme, Weather, Police and Sports Notes.

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PROGRAMMES FOR WEDNESDAY (November 12)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

ALGIERS (N. Africa)

825.3 kc/s (363.4 m.); 13 kW.
Transmits at intervals from 12.30 p.m.
7.0 p.m.—Talk on Films.
7.15 p.m.—Weather, Agricultural Report and Shipping Notes.
7.30 p.m.—Soloist Recital.
7.45 p.m.—News Bulletin.
8.0 p.m.—Concert. Overture, "Oberon" (Weber). Italian Symphony (Mendelssohn). Prologue, "The Beatitudes" (César Franck). Siegfried Idyll (Wagner). Canzonetta, Character Dance and Russian Dance (Tchaikovsky). In the interval at 8.30 p.m.—Review of New Books.

10.0 p.m.—News Bulletin.
10.15 p.m.—Gramophone Records.
10.45 p.m.—Dance Music Programme.

BARCELONA (Spain)

Radio-Barcelona (EAJ7). 860 kc/s (349 m.); 8 kW.
Transmits at intervals from 8.0 a.m.
6.0 p.m.—Trio Music and News.
7.0 p.m.—Gramophone Records.
8.30 p.m.—Elementary French Lesson.
9.0 p.m.—Chimes, Weather and Exchange.

9.5 p.m.—Orchestral Selections.
10.0 p.m.—News Bulletin.
10.5 p.m.—Literary Programme.
10.20 p.m.—Choral Concert.
11.0 p.m.—Gramophone Records.
12 midnight (approx.)—Close Down.

BERLIN (Germany)

Königs Wusterhausen. 183 kc/s (1,635 m.); 35 kW.
Transmits at intervals from 5.24 a.m.
3.30 p.m.—Programme from Hamburg.
4.30 p.m.—Stories about Musicians.
5.0 p.m.—Talk: David Caspar Friedrich and German Landscape.
5.30 p.m.—Educational Talk: The Physical Aspect of the World at the Present Time.
6.0 p.m.—Talk for Civil Servants.
6.55 p.m.—Weather for Farmers.
7.0 p.m.—Talk: Needs of the Time—the New Nationalism.
7.30—11.30 p.m.—Programme relayed from Berlin (Witzleben).
11.30 p.m. (approx.)—Close Down.

BERLIN (Germany)

Witzleben. 716 kc/s (418 m.); 1.7 kW.
Transmits at intervals from 6.0 a.m.
6.0 p.m.—"Balzac's Panopticon"—Programme of Readings.
7.0 p.m.—Choral Concert.
7.25 p.m.—Labour Market Report.
7.30 p.m.—Topical Talk.
8.0 p.m.—News; Sports Notes.
8.10 p.m.—Symphony Concert. Symphonic Poem, Romeo and Juliet (Tchaikovsky). Concerto for Viola and Orchestra (Karl Marx). "Till Eulenspiegel's Merry Pranks" (R. Strauss).
9.15 p.m.—Weather, News, and Sports Notes, followed by Dance Music Programme. In the interval: Report on the Six Days' Racing.

BERNE (Switzerland)

Radio-Bern. 743 kc/s (403 m.); 1.1 kW.
Transmits at intervals from 11.43 a.m.
6.28 p.m.—Time and Weather.
6.30 p.m.—Talk: Hospitality throughout the Ages.
7.0 p.m.—Accordion Recital.
7.30 p.m.—"Knörri und Wunderli"—Dialect Play in Three Acts (von Greyerz), followed by Orchestral Concert.

9.0 p.m.—News and Weather.
9.15 p.m.—Orchestral Concert.
9.45 p.m. (approx.)—Close Down.

BRATISLAVA (Czechoslovakia)

1,076 kc/s (279 m.); 14 kW.
Transmits at intervals from 10.30 a.m.
6.20 p.m.—Introductory Talk to the following Transmission.
6.30 p.m.—"Il Seraglio"—Opéra-comique in Three Acts (Mozart).
8.30 p.m.—Gramophone Records.
9.0 p.m.—Programme from Prague.
9.15 p.m.—Programme Announcements.

BRESLAU (Germany)

923 kc/s (325 m.); 1.7 kW.
Relayed by Gletwitz, 1,157 kc/s (259 m.).
Transmits at intervals from 10.15 a.m.
7.30 p.m.—A Humorous Programme with Ludwig-Mannfred Lommel and the Station Orchestra.
8.30 p.m.—Time, Weather, News and Sports Notes.
8.45 p.m. (from Gletwitz)—"Music about Miners"—Concert.

9.10 p.m.—Time, Weather, News, Sports Notes and Programme Announcements.
9.20 p.m.—Talk on the Theatre: Performances at the Breslau Opera House.
9.25 p.m.—Lesson in Shorthand.
9.50 p.m. (approx.)—Silent Night.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1.2 kW.
Transmits at intervals from 5.0 p.m.
6.30 p.m.—Gramophone Records.
7.30 p.m.—Le Journal Parlé.
8.10 p.m.—Talk: Work and the League of Nations.
8.15 p.m.—Orchestral Concert. Selection from "His Life for the Czar" (Chlinka). Songs: (a) Parmi les champs couvert de neige, and (b) Les Lilas (Rachmaninoff), (c) Romance (Tchaikovsky). Two Dances (Granados). Songs (de Falla): (a) Serenade, (b) Song. Two Dances (de Falla). Interlude. Selection from "Carmen" (Bizet). Caprice for Flute (Chaminade). Selection from "Cendrillon" (Massenet). Gavotte for 'Cello (Popper). Suite fantastique (Marie).
10.15 p.m.—News Bulletin.

BUCHAREST (Romania)

Radio Bucarest. 761 kc/s (394 m.); 16 kW.
Transmits at intervals from 11.0 a.m.
7.0 p.m.—Harp Solos.
7.30 p.m.—Talk (to be announced).
7.45 p.m.—Recital of Songs.
8.15 p.m.—Violin Recital. Concerto in A Minor (Bach). Poème (Chausson). Polonaise brillante (Wienawsky).
8.45 p.m.—News Bulletin.

BUDAPEST (Hungary)

545 kc/s (550 m.); 23 kW.
Transmits at intervals from 8.15 a.m.
6.0 p.m.—Talk (to be announced).
6.30 p.m.—Relay from the Royal Hungarian Opera House, followed by Concert by a Tzigane Orchestra from the Hotel Hungaria.
COLOGNE (Germany)
Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 1.7 kW.
See Langenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 1 kW.
Relayed by Kalundborg, 260 kc/s (1,153 m.).
Transmits at intervals from 6.30 a.m.
3.0 p.m.—Benefit Concert for the Danish Radio Aid Fund, relayed from the Lorry Establishment.
4.40 p.m.—Exchange; Fish Market Prices.
4.50 p.m.—Talk: The Cultural History of Handicrafts.
5.20 p.m.—French Language Lesson.
5.50 p.m.—Weather and News.
6.15 p.m.—Time Signal.
6.30 p.m.—Agricultural Talk.
6.30 p.m.—Town Hall Chimes.
7.2 p.m.—"Yrsa"—Drama (Oehlenschläger). Music by J. P. E. Hartmann).
8.30 p.m.—Pianoforte Recital. Waltz in C Sharp Minor, Mazurka in B Minor, and Etude in G Flat Major (Chopin). Rhapsody No. 13 (Liszt).
8.50 p.m.—News and Report of the Non-Political Radio Clubs.

CORK (Ireland)

1,337 kc/s (225 m.); 1.5 kW.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.
CRACOW (Poland)
Polskie Radio. 1,229 kc/s (244 m.); 1.5 kW.
Transmits at intervals from 10.40 a.m.
7.0 p.m.—Talk: The Modern Trend of Romanian Literature.
7.15 p.m.—Programme from Warsaw.
9.15 p.m.—Gramophone Records.
9.50 p.m.—News from Warsaw.
10.0 p.m.—Dance Music Programme.
11.0 p.m.—Bugle Call from the Tower of St. Mary's Church.

DUBLIN (Ireland)

(2RN.) 725 kc/s (413 m.); 1.5 kW.
1.30 p.m.—Time, Weather, Stock Report and Gramophone Concert.
6.3 p.m.—Gramophone Records.
6.15 p.m.—Programme for Children.
6.40 p.m.—Agricultural Talk.
6.25 p.m.—Programme for Children.
7.0 p.m.—Gramophone Records.
7.20 p.m.—News Bulletin.
7.30 p.m.—Time and Irish Lesson.
7.45 p.m.—German Lesson.
8.0 p.m.—Organ Recital by A. J. Thornton, relayed from the Unitarian Church.
8.30 p.m.—H. Frazer and Paula Luby in a Sketch.
9.0 p.m.—Selections by the Station Orchestra.
9.30 p.m.—Sponsored Programme.
10.30 p.m.—Time, News, Weather and Close Down.

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.7 kW.
Relayed by Cassel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.15 a.m.
6.30—8.0 p.m.—Programme from Stuttgart.
8.0 p.m.—Concert of Old Italian String Music.
9.15 p.m.—News, Sports Notes and Weather.

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.7 kW.
Relayed by Bremen, 950 kc/s (315.8 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 530 kc/s (566 m.); and Kiel, 1,292 kc/s (232.2 m.).
Transmits at intervals from 5.20 a.m.
3.0 p.m. (from Hanover)—Popular Symphony Concert in the Crystal-palast. Overture, "Don Juan" (Mozart). Aria, O Isis and Osiris, from "The Magic Flute" (Mozart). Ballet Music from "Don Juan" (Gluck). Concert Overture, No. 3 (Gade). Bass Solos: (a) Selection from "Baldur's Death" (Cyrill Kistler), (b) Odins Meeresritt (Loewe). Lyric Suite (Grieg).
4.30 p.m.—Talk: Germans in the South Mark.
4.55 p.m.—Talk for Workers: Free Time.
5.20 p.m.—Sponsored Concert.
5.50 p.m.—Frankfurt Exchange and Hamburg Market Prices.
5.55 p.m.—Weather Report.
6.0 p.m.—Talk: North German Popular Customs.
6.30 p.m.—See Königs Wusterhausen.
7.0 p.m.—Folk Songs in Old and New Settings—Soprano Solos by Maria Toll of Berlin, with Selections by a Male Voice Choir and Women's Choir.
8.0 p.m. (from Kiel)—"Sluderie"—Play in North German Dialect in Four Acts (Ivo Braak), in connection with German Theatre Week.
9.20 p.m.—Weather, Political and Miscellaneous Announcements, Sports Notes and Local News.
9.40 p.m.—Café Wallhof Concert.

HILVERSUM (Holland)

1,004 kc/s (298.8 m.); 8.5 kW.
7.40—9.15 a.m.—Programme of the Workers' Radio Society (V.A.R.A.). Gramophone Records.
9.40—9.55 a.m.—Programme of the Liberal Protestant Radio Society (V.P.R.O.). Religious Transmission.
9.55 a.m. till Close Down.—Programme of the V.A.R.A.
9.55 a.m.—Organ Recital.
10.25 a.m.—Talk on Cookery.
11.10 a.m.—Gramophone Records.
11.40 a.m.—Morning Concert.
1.40 p.m.—Programme for Women.
2.40 p.m.—Exchange Quotations.
3.40 p.m.—Programme for Children.
4.10 p.m.—Pianoforte Recital.
4.40 p.m.—Organ Solos and Gramophone Records.
5.40 p.m.—Talk (to be announced).
6.10 p.m.—Celebration of the Armistice.
6.30 p.m.—Mandoline Lesson.
7.0 p.m.—Exchange Quotations.
7.25 p.m.—Gramophone Records.
7.40 p.m.—Evening Concert.
9.10 p.m.—Relay from the Exhibition of Socialist Art.
10.10 p.m.—Concert (continued).
10.40 p.m.—News Bulletin.
10.55 p.m.—Gramophone Records.
11.40 p.m. (approx.)—Close Down.

HUIZEN (Holland)

160 kc/s (1,875 m.); 8.5 kW.
7.55 a.m. till Close Down.—Programme of the Christian Radio Society (N.C.R.V.).
7.55—9.10 a.m.—Morning Concert.
10.10 a.m.—Service for Hospitals.
10.40 a.m.—Harmonium Recital.
11.40 a.m.—Police Notes.
11.55 a.m.—Gramophone Records.
12.10 p.m.—Instrumental Concert.
1.40 p.m.—Vocal and Instrumental Concert.
2.25 p.m.—Reading by Miss Wentink.
2.55 p.m.—Concert (contd.).
3.55 p.m.—Gramophone Records.

4.40 p.m.—Programme for Children.
5.40 p.m.—Agricultural Talk.
6.25 p.m.—Programme for Young People.
6.55 p.m.—Electro-Technical Lesson.
7.25 p.m.—Police Notes.
7.40 p.m.—Relay of the Evangelical Meeting from the Baptist Church at Stadskanaal. Musical Programme and Addresses.
10.10 p.m.—News Bulletin.
10.20 p.m.—Gramophone Records.
11.10 p.m. (approx.)—Close Down.

KALUNDBORG (Denmark)

Kalundborg Radio. 260 kc/s (1,153 m.); 10 kW.
See Copenhagen Programme.

KATOWICE (Poland)

Polskie Radio. 734 kc/s (408 m.); 16 kW.
Transmits at intervals from 10.40 a.m.
6.0 p.m.—Miscellaneous Announcements, Programme Notes, Theatre Review and Amusement Guide.
6.15 p.m.—Talk: The Silesian Housewife.
6.35 p.m.—News and Sports Notes.
7.0 p.m.—Two Talks.
7.30 p.m.—Concert. In the interval at 8.10 p.m.—Literary Programme.
9.0 p.m.—Talk by T. Drzewiecka.
9.15 p.m.—Gramophone Records.
9.50 p.m.—Meteorological Report, Programme Announcements in French and News.
10.0 p.m.—The Letter Box in French.

KAUNAS (Lithuania)

Radio Kaunas. 155 kc/s (1,935 m.); 7 kW.
Transmits at intervals from 11.0 a.m.
6.0 p.m.—Musical Selections.
7.30 p.m.—Talk: The Baltic Sea.
7.50 p.m.—Talk: The Importance of Written Work in the Development of the Intelligence.
8.10 p.m.—Concert of Light Music.

KÖNIGSBERG (Germany)

Ostmarken Rundfunk. 1,085 kc/s (276 m.); 1.7 kW.
Relayed by Danzig, 662 kc/s (453 m.).
Transmits at intervals from 5.30 a.m.
6.0 p.m.—Vocal and Instrumental Concert with Humorous Interludes.
7.45 p.m. (from Danzig)—Reading from the Novel "Verdi" (F. Werfel).
8.15 p.m.—Symphony Concert. Concerto for Piano and Orchestra (Trapp). Symphony in One Movement, Op. 29 (Nielsen).
9.15 p.m.—Weather, News and Sports Notes.
9.30 p.m.—Dance Music from Berlin (Witzleben).
11.30 p.m. (approx.)—Close Down.

LAHTI (Finland)

167 kc/s (1,796 m.); 54 kW.
Relayed by Helsingfors, 1,355 kc/s (221 m.).
Transmits at intervals from 10.0 a.m.
6.0 p.m.—Concert of Military Music. In the interval at 6.45 p.m.—Talk.
7.45 p.m.—News in Finnish and Swedish and Close Down.

LANGENBERG (Germany)

Westdeutscher Rundfunk. 635 kc/s (473 m.); 17 kW.
Relayed by Aachen, Cologne and Münster, 1,319 kc/s (227 m.).
Transmits at intervals from 5.45 a.m.
6.0 p.m.—Report on Economics, Weather and Sports Notes.
6.15 p.m.—Talk: What we should know about the New Taxation.
6.40 p.m.—Talk: The Younger Generation in Holland and Belgium.
7.0 p.m.—Orchestral Concert. Overture, "Undine" (Lortzing). Suite, Aus aller Herren Länder (Moszkovsky). Musical Joke, Perpetuum mobile (Joh. Strauss). Waltz, Am Wörther See (Koschat).
7.45 p.m.—News Bulletin.
7.55 p.m.—Ludwig Thoma Recital. Dialogue on Ludwig Thoma: "Tourist und Tegernseerin" (Fortner). Story: My First Love. Musical Interlude. Reading of Poems, Sketches and Humoresques—Grave and Gay. With Ludwig Thoma in the Beerhouse at Tegernsee (Hunkele). "Waldfrieden"—Comedy in One Act (Ludwig Thoma), followed by News, Sports and Miscellaneous Notices, Concert and Dance Music.
11.0 p.m. (approx.)—Close Down.

LEIPZIG (Germany)

Mitteldeutscher Rundfunk. 1,184 kc/s (253 m.); 2.3 kW.
Relayed by Dresden, 941 kc/s (319 m.).
Transmits at intervals from 9.0 a.m.
6.5 p.m.—Talk: The Formation of Capital and Unemployment.
6.30 p.m.—Concert of Dance Melodies. Mädchenkunde (Dance Song from the 17th Century). Aufforderung zum Tanz (from the 17th Century).

Rigaudon and Gavotte (Rameau). Old Song for the Neidhardt von Reuenthal Round Dance (13th Century). Tanz, Mädelein, tanz! (1622). Swabian Dance of Death (17th Century). Three German Dances, arranged by Burmester: (a) Minuet (Händel), (b) German Dance (Mozart), (c) Waltz (Hummel). Three Folk Melodies. Spanish Dance No. 8 (Sarasate). Mazurka (Wieniawsky). Dance Song from Upper Swabia. Dance from the Westrich. Austrian Dance. Four Old Dances (arr. Chitz). Hungarian Dances (Brahms): (a) No. 6 in B Flat Major, (b) No. 8 in A Minor, (c) No. 5 in G Minor.
7.45 p.m.—Discussion: The Future of the Cinema.
8.30 p.m.—Recital of Legends and Ballads.
9.15 p.m.—Time, Weather, News and Sports Notes, followed by Dance Music Programme.
11.0 p.m. (approx.)—Close Down.

LJUBLJANA (Yugoslavia)

Radio-Ljubljana. 522 kc/s (574.7 m.); 2.8 kW.
Transmits at intervals from 11.15 a.m.
6.30 p.m.—Talk on History.
7.0 p.m.—Concert of Polish Music.
9.0 p.m.—Weather and News.

MADRID (Spain)

Union Radio (EAJ7). 707 kc/s (424 m.); 2 kW.
Transmits at intervals from 8.0 a.m.
7.0 p.m.—Chimes, Exchange Quotations, Market Prices and Topical Review for Women.
7.30 p.m.—Dance Music Programme.
8.25 p.m.—News Bulletin.
8.30—10.0 p.m.—Interval.
10.0 p.m.—Chimes, Time, Exchange Quotations and Band Concert from the Hotel Nacional.
12 midnight.—Chimes, News and Dance Music.
12.30 a.m. (Thursday)—Close Down.

MILAN (Italy)

Ente Italiano Audizioni Radiofoniche. 590 kc/s (501 m.); 8.5 kW.
Programme relayed by Turin, 1,008 kc/s (273.2 m.); and Genova, 788 kc/s (381 m.).
Transmits at intervals from 7.15 a.m.
6.20 p.m.—Announcements.
6.30 p.m.—Concert of Light Music.
6.45 p.m.—Giornale radio; Weather.
7.30 p.m.—Time Signal.
7.30 p.m.—Dance Music Programme.
7.32 p.m.—"Endlich allein"—Opera in Three Acts (Lehár). In the intervals, Talk: The Scientific Organisation of Work and Theatre Notes. After the Opera, Dance Music relayed from the Café Alfieri, Turin.
10.0 p.m. (in the interval)—Giornale radio.
10.55 p.m.—News Bulletin.
11.0 p.m. (approx.)—Close Down.

MOTALA (Sweden)

222.5 kc/s (1,348 m.); 40 kW.
See Stockholm Programme.

MÜNCHEN (Germany)

563 kc/s (533 m.); 1.7 kW.
Relayed by Augsburg, 536 kc/s (560 m.); Kaiserslautern, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (239 m.).
Transmits at intervals from 5.45 a.m.
5.45 p.m.—French Language Lesson.
6.5 p.m.—Review of Educational Affairs.
6.30 p.m.—Topical Programme.
7.0 p.m.—"The Circus Princess"—an Opera in Three Acts (Kálmán), followed by Concert and Dance Music from the Café Luitpold.
9.20 p.m. (in the interval)—Time, Weather, News and Sports Notes.
11.0 p.m. (approx.)—Close Down.

OSLO (Norway)

Kringkastingselskapet. 280 kc/s (1,071 m.); 75 kW.
Relayed by Fredrikstad, 815 kc/s (368 m.); Hamar, 511 kc/s (587 m.); Notodden, 674 kc/s (445 m.); Porsgründ, 662 kc/s (453 m.); and Rjukan, 674 kc/s (445 m.).
Transmits at intervals from 10.10 a.m.
6.30 p.m.—Talk, arranged by Oslo University: What is Industrial Activity?
7.0 p.m.—Time Signal.
7.2 p.m.—Talk: Important Days in the Year 1905.
7.30 p.m.—Orchestral Concert.
8.30 p.m.—News, Weather and Press Review.
8.50 p.m.—Topical Talk.
9.5 p.m.—Recital of English Songs by John Armstrong (Tenor). Part I. Old Songs: When Icicles liang by the Wall. Come away, Death. Now Phœbus sinketh in the West (Arne). I heard a Brooklet gushing.

Programmes for Wednesday—(Cont.)

Part II. Modern Songs. Abendstimmung and O so White, O so Soft, O so Sweet is She (Deliuss). She I love (Van Dieren). Pretty Ring-Time (Warlock). D'un vanneur de blé aux vents (Lennox Berkeley). Joy Shipmate, Joy (Vaughan Williams).
 9.35 p.m.—Gramophone Dance Music.
 11.0 p.m. (approx.)—Close Down.
PARIS (France)
 Eiffel Tower (FL). 207 kc/s (1,445 m.); 15 kW.
 7.50 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
 9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
 5.45 p.m.—Le Journal Parlé.
 7.10 p.m.—Meteorological Forecast.
 7.20 p.m.—Symphony Concert. The Italian Symphony (Mendelssohn-Salabert). Intermezzo (Moussorgsky-Salabert). Violin Solos. Waltz from "Le Pas des Fleurs" (Debussy).
 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
 8.15 p.m.—Concert by Mario Cazes and his Orchestra.
 10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).
PARIS (France)
 Poste Parisien. 914 kc/s (329 m.); 1.2 kW.
 9.0 a.m.—Transmission of Pictures.
 8.45 p.m.—Gramophone Records, Talk and News Bulletin.
 9.0 p.m.—Concert. "Overture, "Les Pitites Michus" (Messager). Hymne à Tanit (Florent Schmitt). Selection from "La timbale d'argent" (Vasseur). Waltz, Light as Foam (Fetrás). Selection from "The Mute of Portici" (Auber). Sonata in C Minor for Violin and Pianoforte (Grieg). Selection from "La Jolie Parfumeuse" (Offenbach). Ti-Bériosa (F. Casadesus). Scène et ballet au clair de lune (Filippucci). Valse au clair de lune (Godard). Song and Rondo from "Le roi Dagobert" (Rousseau).
PARIS (France)
 Radio-Paris. (CFR.) 174 kc/s (1,725 m.); 17 kW.
 Transmits at intervals from 6.45 a.m.

12.30 p.m.—Gramophone Concert. In the intervals at 1.0 p.m.—Exchange Quotations and News, and at 1.30 p.m.—Exchange Quotations.
 2.0 p.m.—Exchange; Market Prices.
 3.30 p.m.—Exchange Quotations.
 3.45 p.m.—Gramophone Records.
 4.55 p.m.—News and Exchange Quotations.
 6.0 p.m.—Agricultural Report and Racing Results.
 6.25 p.m.—New York Exchange Rates.
 6.30 p.m.—Gramophone Records.
 7.0 p.m.—Talk on Horticulture.
 7.15 p.m.—Talk: The Autumn Salon and its History.
 7.30 p.m.—Medical Talk: The Extinction of Rats.
 7.45 p.m.—Commercial Prices, Economic and Social Notes and News.
 8.0 p.m.—Literary Reading: "Antigone" according to Sophocles and Jean Cocteau.
 8.30 p.m.—Sports Review.
 8.45 p.m.—Concert. Concerto for Violin and Orchestra (Tchaikovsky). Songs (Zoubaloff): (a) Epître à Monseigneur, (b) Oraison, (c) Horace et Lydie. Symphony No. 3 (Brahms). In the interval at 9.15 p.m.—Press Review, News and Time Signal.
POZNAŃ (Poland)
 896 kc/s (335 m.); 1.9 kW. Also relayed on 9,830 kc/s (30.5 m.), from 7.30—9.0 p.m.
 Transmits at intervals from 6.15 a.m.
 7.0 p.m.—Musical Selections.
 7.15 p.m.—Topical Talk.
 7.30 p.m.—Concert of Light Music. In the intervals, Programme and Theatre Notes.
 9.0 p.m.—Time, News, Sports and Police Notes.
 9.15 p.m.—Dance Music from the Café Polonia.
 11.0 p.m. (approx.)—Close Down.
PRAGUE (Czechoslovakia)
 Stranice. 617 kc/s (487 m.); 5.5 kW.
 Transmits at intervals from 10.15 a.m.
 6.20 p.m.—Programme from Bratislava.
 8.30 p.m.—Gramophone Records.
 9.0 p.m.—Time, News and Sports Notes.

9.15 p.m.—News, Theatre Notes and Programme Announcements.
RIGA (Latvia)
 Radio Riga. 572 kc/s (525 m.); 13 kW.
 Transmits at intervals from 10.0 a.m.
 6.0 p.m.—Meteorological Report.
 6.3 p.m.—Operetta in Three Acts (Kálmán). In the intervals, News.
 8.0 p.m.—Meteorological Report.
ROME (Italy)
 Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 75 kW. Relayed by Naples, 905 kc/s (332 m.); and Prato Smeraldo, 11,804 kc/s (25.4 m.).
 Transmits at intervals from 7.15 a.m.
 6.45 p.m.—Giornale Radio, News, Sports Notes, Announcements, and Report of the International Institute of Agriculture in Italian, French, English, German and Spanish.
 7.30 p.m.—Time Signal.
 7.32 p.m.—Dance Music Programme.
 8.5 p.m.—"L'Africaine"—Opera in Four Acts (Meyerbeer). In the intervals, Talk on the Theatre and Topical Review.
 9.55 p.m. (approx.)—Late News.
SCHENECTADY (U.S.A.)
 General Electric Company (WGY). 790 kc/s (370.5 m.); 50 kW. Relayed at intervals by W2XAF on 9,530 kc/s (31.48 m.) and by W2XAD on 15,340 kc/s (19.56 m.).
 Transmits at intervals from 11.45 a.m.
 11.30 p.m.—Green Room Orchestra.
 11.45 p.m.—New York Relay.
 12 midnight.—Weather Forecast.
 12.1 a.m. (Thursday).—Health Talk.
 12.6 a.m.—Cello Solos.
 12.14 a.m.—Time Signal.
 12.15 a.m.—The Gondoliers.
 12.30 a.m.—Chevrolet Programme.
 1.0 a.m.—General Electric Programme.
 1.30 a.m.—Programme from New York.
 4.0 a.m.—Dance Music Programme.
 5.0 a.m. (approx.)—Close Down.
STOCKHOLM (Sweden)
 Radiotjänst (SASA). 689 kc/s (436 m.); 75 kW. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hårbý, 1,166 kc/s (257 m.); Motala, 222.5 kc/s (1,348 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).

Transmits at intervals from 6.15 a.m.
 6.0 p.m.—Concert of Russian and Romanian Folk Music.
 6.25 p.m.—Reading from "The Clown Jac"—Serial Story (Hjalmar Bergman).
 7.0 p.m. (from Göteborg).—Symphony Concert. Symphony No. 85 in B flat Major—The Queen Symphony (Haydn). Symphonic Poem, Don Juan (R. Strauss). Lament in Memory of a Young Artist (L. Sinigaglia).
 8.15 p.m.—Weather and News.
 8.40 p.m.—Talk: The Abuse of Alcohol and its Consequences.
 9.10 p.m.—Gramophone Dance Music.
 10.0 p.m. (approx.)—Close Down.
STRASBOURG (France)
 Radio-Strasbourg (PTT). 869 kc/s (346 m.); 15 kW.
 Transmits at intervals from 11.0 a.m.
 6.0 p.m.—Talk in French: Through Lorraine.
 6.15 p.m.—Instrumental Concert.
 7.15 p.m.—News in French and German.
 7.30 p.m.—Instrumental Concert.
 8.30 p.m.—Alternate Relay of Concerts from the Cafés de la Paix and de l'Odéon.
 10.30 p.m.—Dance Music from the Caveau de l'Aubette.
 12 midnight (approx.)—Close Down.
STUTTART (Germany)
 Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.7 kW. Relayed by Freiburg, 527 kc/s (570 m.).
 Transmits at intervals from 5.5 a.m.
 6.30 p.m.—Violin Rhapsodies. Rhapsody for Violin and Pianoforte, The Lark ascending (Vaughan Williams). A Scottish Rhapsody (Florizel von Reuter). Bulgarian Rhapsody, Vardar (Pantscho Vladigeroff). Rhapsody for Violin and Pianoforte, Tzigane (Ravel).
 7.15 p.m.—Talk, illustrated by Gramophone Records: Biedermeyer in a Strait-Jacket.
 8.0 p.m.—Programme from Frankfurt.
 9.15 p.m.—Programme Announcements, News and Silent Night for Distant Reception.
TOULOUSE (France)
 Radiophonie du Midi. 779 kc/s (385 m.); 8 kW.
 Transmits at intervals from 1.0 p.m.
 6.15 p.m.—Exchange Quotations.
 6.30 p.m.—Dance Music Programme.

6.45 p.m.—Market Prices.
 6.55 p.m.—Recital of Songs.
 7.30 p.m.—News Bulletin.
 7.45 p.m.—Hawaiian Guitar Music.
 8.0 p.m.—Concert by a Symphony Orchestra.
 8.30 p.m.—Operetta Concert. Selections from "La Fille de Madame Angot" (Lecocq), "Les Cloches de Corneville" (Planquette), "Frederica" (Lehár) and "La Mascotte" (Audran).
 8.55 p.m.—Fashion Notes.
 9.0 p.m.—Time and Relay from the Café des Américains.
 11.0 p.m.—Soloist Recital.
 11.30 p.m.—Concert by a Viennese Orchestra.
 12 midnight.—News and Close Down.
VIENNA (Austria)
 Radio-Wien. 581 kc/s (516.3 m.); 20 kW. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
 Transmits at intervals from 10.0 a.m.
 6.0 p.m.—"Die rote Gred"—Opera in Three Acts (Julius Bittner).
 9.35 p.m.—News Bulletin, followed by *Orchestral Concert*. Prelude to "Lohengrin" (Wagner). Waltz, Delirien (Joh. Strauss). Selections from "La Traviata" (Verdi). Concert Piece for Violin, Tango capriccio (Netsch). Concert Piece, Poème orientale (Werba, Jun.). Two Songs (Lehár): (a) Dein ist mein ganzes Herz, (b) Song from "The Land of Smiles". Viennese Operetta Revue (Robert Schuster). March, Der Tausendkünstler (Blankenburg).
WARSAW (Poland)
 Polskie Radio. 212 kc/s (1,411 m.); 14 kW.
 Transmits at intervals from 10.40 a.m.
 6.25 p.m.—Gramophone Records.
 6.35 p.m.—Radio Journal.
 6.50 p.m.—Gramophone Records.
 7.0 p.m.—Government Report.
 7.15 p.m.—Talk (to be announced).
 7.30 p.m.—Vocal and Instrumental Concert. In the intervals, Programme Announcements, Theatre Review and Literary Programme.
 9.0 p.m.—Talk: London at Night.
 9.15 p.m.—Gramophone Records.
 9.50 p.m.—Weather, Police and Sports Notes.
 10.0 p.m.—Dance Music Programme.
 11.0 p.m. (approx.)—Close Down.



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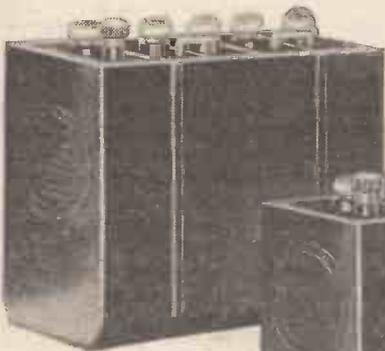
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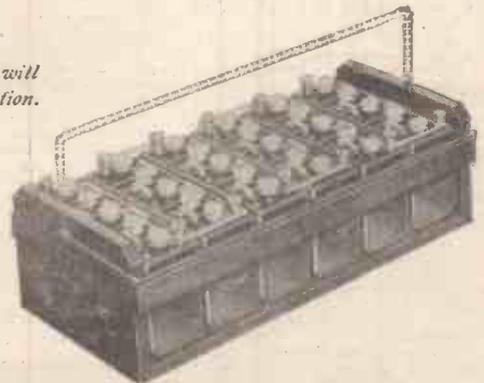
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PROGRAMMES FOR THURSDAY (November 13)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

ALGIERS (N. Africa)

825.3 kc/s (363.4 m.); 13 kW.
Transmits at intervals from 12.30 p.m.
7.15 p.m.—Spanish Song Recital.
7.30 p.m.—News Bulletin.
7.45 p.m.—Waltz Music.
8.0 p.m.—Programme of Monologues and Humorous Songs.
8.30 p.m.—Instrumental Solos.
9.0 p.m.—Sketch in Dialect (Jeannot).
9.15 p.m.—"The Man who saw the Devil"—Comedy.
10.0 p.m.—News Bulletin.
10.15 p.m.—Gramophone Records.

BARCELONA (Spain)

Radio-Barcelona (EAJI). 860 kc/s (349 m.); 8 kW.
Transmits at intervals from 8.0 a.m.
6.0 p.m.—Programme for Children.
6.30 p.m.—Trio Music and News.
7.0 p.m.—Gramophone Records.
8.30 p.m.—Elementary English Lesson.
9.0 p.m.—Chimes, Weather, Exchange and Part Relay of an Opera from El Gran Teatro del Liceo.
News in the interval.
12 midnight (approx.)—Close Down.

BERLIN (Germany)

Königs Wusterhausen. 183 kc/s (1,635 m.); 35 kW.
Transmits at intervals from 5.25 a.m.
3.30 p.m.—See Berlin (Witzleben).
4.30 p.m.—Chamber Music.
5.0 p.m.—Talk: The New Revaluation Bill.
5.25 p.m.—Educational Talk: Goethe's Faust.
6.0 p.m.—Talk: What do you think of the League of Nations?
6.30 p.m.—Agricultural Talk.
6.55 p.m.—Weather for Farmers.
7.0 p.m.—Programme from Frankfurt.
9.0 p.m.—Programme from Berlin (Witzleben).
11.30 p.m. (approx.)—Close Down.

BERLIN (Germany)

(Witzleben). [716 kc/s (418 m.); 1.7 kW].
Transmits at intervals from 6.0 a.m.
3.30 p.m.—Concert. Arioso and Presto for Flute (Quantz). Soprano Solos: (a) Mattinata, (b) Aneora, (c) La Serenata (Tosti). Tone Poems for Viola and Pianoforte, Op. 34 (Klaas): (a) Ernste Weise, (b) Schmetterlingspiele, (c) Wenn es Abend wird, (d) Nächtliches Fest, (e) Mysterium. Soprano Solos: (a) Tre giorni, (b) Se tu m'ami, (c) La Zingarella (Pergolesi), (d) Lolita (Buzzi-Peccia). Flute Solos: (a) Prelude, Op. 134, (b) Scherzo, Op. 134 (Heuer).
4.30 p.m.—Programme for Young People. Talk: John D. Rockefeller.
4.50 p.m.—Book Review.
5.20 p.m.—Topical Programme.
5.55 p.m.—Labour Market Report.
6.0 p.m.—Paul Apel reads Strange Tales.
6.30 p.m.—Programme from Königsberg.
7.15 p.m.—"Timon of Athens"—Drama (Shakespeare).
9.0 p.m.—Last Hour of the Six Days' Racing.
10.5 p.m.—Weather, News and Sports Notes, followed by Dance Music from the Hotel Eden.
11.30 p.m. (approx.)—Close Down.

BERNE (Switzerland)

Radio-Bern. 743 kc/s (403 m.); 1.1 kW.
Transmits at intervals from 11.43 a.m.
6.0 p.m.—Elementary English Lesson.
6.28 p.m.—Time and Weather.
6.30 p.m.—Reading from the Works of Dr. Chlanzi.
7.0 p.m.—"Dalibor"—Opera in Three Acts (Smetana), relayed from the Municipal Theatre, Zürich, 653 kc/s (459 m.).
9.15 p.m. (approx.)—News, Weather and Close Down.

BRESLAU (Germany)

923 kc/s (325 m.); 1.7 kW. Relay by Gleiwitz, 1,157 kc/s (259 m.).
Transmits at intervals from 8.5 a.m.
7.2 p.m.—Talk: The Constitution.
7.30 p.m.—Wilhelm Raabe Memorial Programme on the Twentieth Anniversary of his Death. "The World of Finkenrade"—Wireless Scene about Raabe's Characters (Lorenz Frenken).
8.20 p.m.—Topical Talk.
8.45 p.m.—Time, Weather, News and Sports Notes.
8.55 p.m.—Orchestral Concert of Modern Operetta Music.

9.30 p.m.—Time, Weather, News, Sports Notes and Programme Announcements.
9.45 p.m.—Orchestral Concert and Dance Music.
10.10 p.m. (in an interval)—Talk: Late Autumn on the Sproutau Heath.
11.30 p.m. (approx.)—Silent Night.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1.2 kW.
Transmits at intervals from 5.0 p.m.
6.30 p.m.—Colonial Report.
6.35 p.m.—Gramophone Concert.
7.30 p.m.—Le Journal Parlé.
8.10 p.m.—Talk: The Second Assembly of the League of Nations.
8.15 p.m.—Trio Selections.
8.40 p.m.—Topical Review.
8.45 p.m.—Concert arranged by the French Socialist Radio Society (RESEF).
10.45 p.m.—News Bulletin.

BRUSSELS (No. 2) (Belgium)

887 kc/s (338.2 m.); 12 kW.
7.45 p.m.—Gramophone Records.
8.15 p.m.—Concert. Coronation March (Strauwen). Overture; "The Marriage of Figaro" (Mozart). In a Persian Market and In a Monastery Garden (Ketelbey); Second Suite from "L'Arlésienne" (Bizet). Selection from "Cavalleria rusticana" (Mascagni). Third Fantasia (Benoit). Selection from "The Merry Peasant" (Fall). Waltz, La Housarde (Ganne). Talk in the interval.

BUCHAREST (Romania)

Radio-Bucarest. 761 kc/s (394 m.); 16 kW.
Transmits at intervals from 11.0 a.m.
7.0 p.m.—Orchestral Selection.
7.30 p.m.—Talk (to be announced).
7.45 p.m.—Recital of Songs.
8.15 p.m.—Orchestral Selections. Symphonic Poem, Danse macabre (Saint-Saëns). Second Suite from "La Farandole" (Dubois).
8.45 p.m.—News Bulletin.

BUDAPEST (Hungary)

545 kc/s (550 m.); 23 kW.
Transmits at intervals from 8.15 a.m.
6.15 p.m.—Literary Talk.
6.50 p.m.—Comedy Programme, followed by Concert by a Tzigane Orchestra from the Café Emke.

COLOGNE (Germany)

Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 1.7 kW.
See Langenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 1 kW. Relay by Kalundborg, 260 kc/s (1,153 m.).
Transmits at intervals from 6.30 a.m.
2.0 p.m.—Instrumental Concert.
2.45 p.m. (in the interval)—Reading.
4.0 p.m.—Programme for Children.
4.40 p.m.—Exchange; Fish Market Prices.

COLOGNE (Germany)

4.50 p.m.—Talk by E. Marott.
5.20 p.m.—English Language Lesson.
5.50 p.m.—Weather and News.
6.15 p.m.—Time Signal.
6.30 p.m.—Talk from the Aarhus Studio: Aarhus University.
7.0 p.m.—Town Hall Chimes.
7.2 p.m.—Recital by Daniel Prior.
7.15 p.m.—Concert from the Works of Old Masters. Ballet Music from "Alceste" (Gluck). Minuet from the Symphony in G Minor, and Gavotte from "Idomeneus" (Mozart). Viennese Dance (Beethoven). Waltz, Op. 9, and Ecosaise for Wind Instruments (Schubert).
8.0 p.m.—"Antikvitet Söges"—Radio Sketch (Ella Byström).
8.25 p.m.—Recital of Danish Songs.
8.50 p.m.—News and Report of the Jutland Listeners' Society.
9.10 p.m.—Reading (F. Nygaard).
9.35 p.m.—Sonata for Cello and Pianoforte (Brahms).
10.0 p.m. (approx.)—Close Down.

CORK (Ireland)

(6CK). 1,337 kc/s (225 m.); 1.5 kW.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.

CRACOW (Poland)

Polskie Radio. 1,229 kc/s (244 m.); 1.5 kW.
Transmits at intervals from 10.40 a.m.
7.0 p.m.—Talk from Warsaw.
7.15 p.m.—Talk on Politics.
7.30 p.m.—Evening Concert.
8.30 p.m.—Programme from Warsaw.
10.0 p.m.—Concert of Light Music.
11.0 p.m. (approx.)—Bugle Call from the Tower of St. Mary's Church.

DUBLIN (Ireland)

(2RN). 725 kc/s (413 m.); 1.5 kW.
1.30 p.m.—Time, Weather, Stock Report and Gramophone Concert.
6.0 p.m.—Gramophone Records.
6.15 p.m.—Programme for Children.
7.0 p.m.—Gramophone Records.
7.10 p.m.—News Bulletin.
7.30 p.m.—Time and French Lesson.
7.45 p.m.—Literary and Dramatic Talk.
8.0 p.m.—Concert. The Station Orchestra: Favourite Marches. May Doyle (Soprano): Minuet and Waltz Songs. T. Keane (Bass): Marching Songs. Music Talk by H. R. White. Eva Brennan and Company in a Revue. The Station Orchestra.
9.30 p.m.—Sponsored Programme.
10.30 p.m.—Time, News, Weather and Close Down.

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.7 kW. Relay by Cassel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.15 a.m.
6.0 p.m.—Time, Weather and Economic Notes.
6.5 p.m.—French Language Lesson.
6.30 p.m.—Talk on Instruments of the Orchestra: The Harp.
7.0 p.m.—Concert of Unfamiliar Strauss Dance Music.
9.30 p.m.—News, Sports Notes and Weather.
9.45 p.m.—Orchestral Dance Music from the Café Kiefer, Saarbrücken.

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.7 kW. Relay by Bremen, 950 kc/s (315.8 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 530 kc/s (566 m.); and Kiel, 1,292 kc/s (232.2 m.).
Transmits at intervals from 5.20 a.m.
5.55 p.m.—Talk: Namine-Marie Witt-Paulsen, a Frisian Poetess.
6.25 p.m.—Talk: Weather and its Influence on Health.
6.50 p.m.—Exchange and Weather.
7.0 p.m.—"Animals accuse you!"—A Radio Sketch (Ernst Johannsen).
7.45 p.m.—Choral Music from Five Centuries. Liebesklage (Folk Melody, 1400). Die Schöne (Folk Melody, 1540). Der Wundergarten der Liebe (Folk Melody, 1540). Kein Freud' ohn' Sündich (Regnart, 1540-1600). On a Sunday in Spring (Donati, 1603). Love in a Boat (Gastaldi, 1556-1622). My Sweet Love that laughs (Dowland, 1562-1626). Come back Sweet Love (Dowland). In der Marienkirche (Loewe, 1796-1869). Spielmannstänchen (Mozart, 1756-1791). Die Ungetreue, Folk Melody of the Nineteenth Century (arr. Robert Kahn). Waldvögelin, Folk Melody of the Nineteenth Century, arr. Robert Kahn).
Jetztund-reis-ich-weg-von-dir (Folk Melody of the Seventeenth Century); A Swedish Peasant Wedding (Soedermann). Drei Lilien (Folk Melody of the Eighteenth Century, arr. Othegegraven).
9.0 p.m.—Weather, Political, Sports and Miscellaneous Notices.
9.20 p.m.—Relay of Foreign Stations.
9.50 p.m.—Concert from the Ostermann Restaurant.

HILVERSUM (Holland)

1,004 kc/s (298.8 m.); 8.5 kW.
7.40 a.m.—11.40 p.m.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.).
7.40 a.m.—Time and Gramophone Records.
9.40 a.m.—Time and Daily Service.
10.10 a.m.—Quintet Concert.
11.40 a.m.—Time Signal.
11.41 a.m.—Concert relayed from the Asta Theatre, The Hague.
1.40 p.m.—Talk for Women.
2.40 p.m.—Talk (to be announced).
3.40 p.m.—Concert.
4.10 p.m.—Programme for Hospitals.
5.10 p.m.—Concert.
6.40 p.m.—English Language Lesson.
7.10 p.m.—Talk (to be announced).
7.40 p.m.—Time Signal.
7.41 p.m.—Orchestral Concert. Overture, "Das Nachtlager in Granada" (Kreutzer). Fantasia on the Works of Plotow (Urbach). Slavonic Rhapsody (Friedemann). Selections (Schumann): (a) Träumerei, (b) Schlämmerlied. Impression and Polish Dance (Rubinstein). Waltz, Die Romantiker (Lanner). Czardas, Nadja (Michiels).
8.40 p.m.—Talk (to be announced).
9.10 p.m.—Concert relayed from the Concert Hall, Amsterdam.
9.55 p.m.—Weather and News.
10.10 p.m.—Orchestral Concert.
10.40 p.m.—Relay of a Talking Picture: "The Desert Song".
11.40 p.m. (approx.)—Close Down.

HUIZEN (Holland)

160 kc/s (1,875 m.); 8.5 kW.
7.40—8.55 a.m.—Programme of the Catholic Radio Society (K.R.O.). Gramophone Records.
9.40—10.40 a.m.—Programme of the Christian Radio Society (N.C.R.V.).
9.40 a.m.—Selections by a Ladies' Choir.
10.10 a.m.—Service for Hospitals.
11.10 a.m.—1.40 p.m.—Programme of the K.R.O.
11.10 a.m.—Religious Address by the Rev. Perquin.
11.40 a.m.—Police Notes.
11.55 a.m.—Trio Concert.
1.25 p.m.—Gramophone Records.
1.40 p.m.—Talk Close Down.—Programme of the N.C.R.V.
1.40 p.m.—Gramophone Records.
2.25 p.m.—Lesson in Handicrafts.
3.25 p.m.—Gramophone Records.
3.40 p.m.—Programme for Hospitals.
4.40 p.m.—Vocal and Instrumental Concert.
6.10 p.m.—Dressmaking Lesson.
6.25 p.m.—Talk: The Improvement of Wireless Reception.
6.40 p.m.—Gramophone Records.
6.55 p.m.—Lesson in Malayan.
7.25 p.m.—Police Notes.
7.40 p.m.—Orchestral Concert. Symphony in G Minor (Mozart). Cello Solos: (a) Elégie (Fauré), (b) Hebrew Song, Elchen (Gernsheim), (c) Légende (d'Ambrosio). Selections from "Rosamunde" (Schubert).
8.50 p.m.—Talk: The Church and Social Problems.
9.20 p.m.—Concert (cont'd). Symphony No. 4 (Brahms).
10.0 p.m.—News Bulletin.
10.10 p.m.—Gramophone Records.
11.10 p.m. (approx.)—Close Down.

KALUNDBORG (Denmark)

Kalundborg Radio. 260 kc/s (1,153 m.); 10 kW.
See Copenhagen Programme.

KATOWICE (Poland)

Polskie Radio. 734 kc/s (408 m.); 16 kW.
Transmits at intervals from 10.40 a.m.
6.0 p.m.—Miscellaneous Announcements, Programme Notes, Theatre Review and Amusement Guide.
6.15 p.m.—Talk by J. Langman.
6.35 p.m.—News Bulletin.
6.55 p.m.—Talk for Boy Scouts.
7.0 p.m.—Talk by Dr. Gajkowski.
7.15 p.m.—Wireless Technical Talk.
7.30 p.m.—Concert of Light Music.
8.30 p.m.—Literary Programme.
9.15 p.m.—Musical Programme.
9.50 p.m.—Meteorological Report, Programme Announcements in French and News.
10.0 p.m.—Musical Programme.

KAUNAS (Lithuania)

Radio Kaunas. 155 kc/s (1,935 m.); 7 kW.
Transmits at intervals from 11.0 a.m.
6.30 p.m.—Musical Programme.
7.50 p.m.—Talk: Burma.
8.10 p.m.—Talk in Esperanto: Modern Lithuanian Writers.
8.30 p.m.—Concert of Lithuanian Music.

KÖNIGSBERG (Germany)

Ostmarken Rundfunk. 1,085 kc/s (276 m.); 1.7 kW. Relay by Danzig, 662 kc/s (453 m.).
Transmits at intervals from 5.30 a.m.
6.0 p.m.—English Conversational Practice.
6.25 p.m.—Weather Report.
6.30 p.m.—Orchestral Concert. Prelude à l'après-midi d'un faune (Debussy). Fairytale Suite (Suk). Suite, Mother Goose (Ravel).
7.35 p.m.—Programme relayed from Berlin (Witzleben).

LAHTI (Finland)

167 kc/s (1,796 m.); 54 kW. Relay by Helsingfors, 1,355 kc/s (221 m.).
Transmits at intervals from 10.0 a.m.
6.0 p.m.—Symphony Concert. Sinfonia eroica (Beethoven). Bolero (Ravel). Suite from "Hary Janos" (Kodaly). Symphonic Fantasia, Francesca da Rimini (Tchaikovsky).
7.45 p.m.—News in Finnish and Swedish and Close Down.

LANGENBERG (Germany)

Westdeutscher Rundfunk. 635 kc/s (473 m.); 17 kW. Relay by Aachen, Cologne and Münster, 1,319 kc/s (227 m.).
Transmits at intervals from 5.45 a.m.
6.0 p.m.—Report on Economics, Weather and Sports Notes.
6.15 p.m.—Spanish Language Lesson.
6.40 p.m.—Talk: The West German Industrial Area—The Ems District.

7.0 p.m.—Orchestral Concert. Overture, "Phédre" (Massenet). Grotesque and Merry-go-round (Huppertz). Second Suite from "Peer Gynt" (Grieg). Selections from "Das Nachtlager von Granada" (Kreutzer). Waltz, Strand-Novelle (May).
7.30 p.m.—A Topical Confession.
7.55 p.m.—News Bulletin.
8.0 p.m.—Symphony Concert. Variations on a Scottish Folk Song (Raphael). Concerto for Pianoforte in G Minor (Prokofieff). Gestern Abend war Vetter Michel da—Humoresque in Variation Form (Georg Schumann), followed by News, Sports and Miscellaneous Notices, Concert and Dance Music.
11.0 p.m. (approx.)—Close Down.

LEIPZIG (Germany)

Mitteldeutscher Rundfunk. 1,184 kc/s (253 m.); 2.3 kW. Relay by Dresden, 941 kc/s (319 m.).
Transmits at intervals from 9.0 a.m.
6.30 p.m.—Concert of Operetta Songs relayed from Weimar.
7.35 p.m.—See Berlin (Witzleben).
9.0 p.m.—Reading from Helene Böhlau's "Ratsmädel-Geschichten", relayed from Weimar.
9.30 p.m.—Time, Weather, News and Sports Notes, followed by Silent Night.

LJUBLJANA (Yugoslavia)

Radio-Ljubljana. 522 kc/s (574.7 m.); 2.8 kW.
Transmits at intervals from 11.15 a.m.
6.30 p.m.—Talk on Geology.
7.0 p.m.—Transmission of an Opera.
9.30 p.m.—Weather and News.

MADRID (Spain)

Union Radio (EAJ7). 707 kc/s (424 m.); 2 kW.
Transmits at intervals from 8.0 a.m.
7.0 p.m.—Chimes, Exchange Quotations, Market Prices and Programme for Children.
7.30 p.m.—Dance Music Programme.
8.0 p.m.—Talk on Careers.
8.15 p.m.—Dance Music Programme.
8.25 p.m.—News Bulletin.
8.30—10.0 p.m.—Interval.
10.0 p.m.—Chimes, Time, Exchange Quotations and "Medea"—Tragedy (Euripides), adapted for the Wireless by F. G. Mantilla, with Musical Illustrations.
12 midnight—Chimes, News and Dance Music.
12.30 a.m. (Friday)—Close Down.

MILAN (Italy)

Ente Italiano Audizioni Radiofoniche. 590 kc/s (501 m.); 8.5 kW. Programme relayed by Turin, 1,098 kc/s (273.2 m.); and Genoa, 788 kc/s (381 m.).
Transmits at intervals from 7.15 a.m.
7.20 p.m.—Announcements and Report of the Royal Geographical Society.
7.30 p.m.—Concert. March of the Grenadiers (Richter). Waltz, Moonlight on the Alster (Fetras). Selection from "The Master-singers" (Wagner). Madrigale a Nanette (Parenti). Rhapsodie lombarda (Cerrri). Waltz (Hamy).
7.15 p.m.—Giornale Radio; Weather.
7.30 p.m.—Time Signal.
7.32 p.m.—Dance Music Programme.
8.0 p.m.—Programme to be announced. In the intervals, Talk on Music and Review of New Books. After the Programme, Relay of Music.
10.0 p.m. (in the interval)—Giornale Radio.
10.55 p.m.—News Bulletin.
11.0 p.m. (approx.)—Close Down.

MORAVSKÁ-OSTRAVA (Czechoslovakia)

1,130 kc/s (263 m.); 11 kW.
Transmits at intervals from 10.30 a.m.
7.30 p.m.—Cabaret Programme.
8.0 p.m.—Programme from Prague.
9.15 p.m.—Programme Announcements and Theatre Review.
9.20 p.m.—Programme from Prague.

MOTALA (Sweden)

222.5 kc/s (1,348 m.); 40 kW. See Stockholm Programme.

MUNICH (Germany)

563 kc/s (533 m.); 1.7 kW. Relay by Augsburg, 536 kc/s (560 m.); Kaiserslautern, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (230 m.).
Transmits at intervals from 5.45 a.m.
5.45 p.m.—Agricultural Talk.
6.5 p.m.—A Tour through the German Museum in Munich.
7.0 p.m.—Request Programme of Gramophone Records.
7.40 p.m.—Talk: The State's Need of Money.
8.0 p.m.—Concert of Chamber Music for Violin, Cello and Pianoforte. Trio in E Flat Major, Op. 100

Programmes for Thursday—(Cont.)

(Mozart). Trio in G Major (Haydn).
 9.0 p.m.—Talk: The Carinthian Nation.
 9.20 p.m.—Time, Weather, News and Sports Notes.
OSLO (Norway)
 Kringkastingselskapet. 280 kc/s (1,071 m.); 75 kW. Relayed by Fredrikstad, 815 kc/s (368 m.); Hamar, 511 kc/s (587 m.); Norddalen, 674 kc/s (445 m.); Porsgrund, 662 kc/s (453 m.); and Rjukan, 674 kc/s (445 m.).
 Transmits at intervals from 9.0 a.m.
 6.30 p.m.—German Language Lesson.
 7.0 p.m.—Time Signal.
 7.2 p.m.—Agricultural Programme.
 7.30 p.m.—Choral Concert. "Fritjof" and "Normannenzug" (Max Bruch), for Soloist, Choir and Orchestra.
 8.30 p.m.—News, Announcements, Weather and Press Review.
 8.50 p.m.—Topical Talk.
 9.5 p.m.—Talk on Health.
 9.35 p.m. (approx.)—Close Down.
PARIS (France)
 Eiffel Tower (FL). 207 kc/s (1,445 m.); 15 kW.
 7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
 9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
 5.45 p.m.—Le Journal Parlé.
 7.10 p.m.—Meteorological Forecast.
 7.20 p.m.—Evening Concert. At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
 10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)
 Poste Parisien. 914 kc/s (329 m.); 1.2 kW.
 9.0 a.m.—Transmission of Pictures.
 8.45 p.m.—Gramophone Records, Talk and News Bulletin.
 9.0 p.m.—Concert. Overture, "The Mastersingers" (Wagner). "The Flight of the Bumble-bee, from "The Tale of Czar Saltana" (Rimsky-Korsakoff). Saltarelle from the Italian Symphony (Mendelssohn). Ballet Music from "Sylvia" (Delibes). Danseuses de Delphes from "Les préludes" (Debussy). Divertissement et petite valse (Guiraud). Dance of the Priestesses from "Samson and Delilah" (Saint-Saëns).

PARIS (France)
 Radio Paris. (CFR). 174 kc/s (1,725 m.); 17 kW.
 Transmits at intervals from 6.45 a.m.
 12.30 p.m.—Gramophone Concert. In the intervals at 1.0 p.m.—Exchange Quotations and News and at 1.30 p.m.—Exchange Quotations.
 2.0 p.m.—Exchange; Market Prices.
 3.30 p.m.—Exchange Quotations.
 3.45 p.m.—Gramophone Dance Records.
 4.55 p.m.—News and Exchange Quotations.
 6.0 p.m.—Agricultural Report and Racing Results.
 6.25 p.m.—New York Exchange Rates.
 6.30 p.m.—Gramophone Records.
 7.0 p.m.—Talk on America.
 7.30 p.m.—Elementary Book-keeping Lesson.
 7.45 p.m.—Commercial Prices, Economic and Social Notes and News.
 8.0 p.m.—Concert. Variety Item: Life in the Literary Cafés of the Nineteenth Century—the Café Lemblin (1819). Pianoforte Solos (Albéniz): (a) Cordoba, (b) Tango, (c) Seguidillas. Songs (Duparc): (a) Testament, (b) Extase, (c) La Vague et la Cloche, (d) La vie antérieure, (e) Soupir, (f) L'invitation au voyage. Sonata No. 1 for Violin and Piano (de Bériot). In the intervals at 8.30 p.m.—Sports Review and at 9.15 p.m.—Press Review, News and Time Signal.

POZNAŃ (Poland)
 896 kc/s (335 m.); 1.9 kW.
 Transmits at intervals from 6.0 a.m.
 7.0 p.m.—Talk on Belgian Literature.
 7.15 p.m.—Elementary English Lesson.
 7.30 p.m.—Concert. "Heroism in Battle"—Baritone Solos: (a) The Two Grenadiers (Schumann), (b) Heroism (Tchaikovsky). Pianoforte Solos: (a) Fire Magic from "Die Walküre" (Wagner), (b) Funeral March for the Death of a Hero (Beethoven), (c) Prelude in G Minor (Rachmaninoff). Baritone Solos: (a) The Roaring of the Storm (Szymanovsky) (b) Battle Song (Moniuszko). Pianoforte Solos (Chopin): (a) Etude in C Minor, (b) Polonaise. Baritone Solos: (a) King Saul (Moussorgsky)

(b) The King goes to War (Kene-man), (c) Aria from "André Chénier" (Giordano). In the intervals, Theatre Notes and Programme Announcements.
 8.30 p.m.—Programme from Warsaw.
 9.15 p.m.—Time, News, Sports and Police Notes.
PRAGUE (Czechoslovakia)
 Stranice. 617 kc/s (487 m.). 5.5 kW.
 Transmits at intervals from 10.15 a.m.
 6.20 p.m.—"The Exciseman and the Treasurer go to a Country Wake"—Play (Kares).
 7.10 p.m.—Talk: The Stechovice Dam.
 7.30 p.m.—Programme from Moravská-Ostrava.
 8.0 p.m.—Symphony Concert.
 9.0 p.m.—Time, News and Sports Notes.
 9.15 p.m.—News, Theatre Notes, and Programme Announcements.
 9.20 p.m.—Organ Recital from the Beranek Cinema.
 10.0 p.m.—Time, News and Chimes.

ROME (Italy)
 Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 75 kW. Relayed by Naples, 905 kc/s (332 m.); and Prato Smeraldo, 11,804 kc/s (25.4 m.).
 Transmits at intervals from 7.15 a.m.
 6.45 p.m.—Giornale Radio, Announcements, News and Press Review.
 7.30 p.m.—Time Signal.
 7.32 p.m.—Dance Music Programme.
 8.5 p.m.—Violin Recital and Orchestral Selections. Selection from "Nina, o la Pazza d'Amore" (Paisiello). Concerto in E Major for Violin and Orchestra (Bach). Intermezzo and Dance from "Dafni" (Mulé). Concerto in D Major for Violin and Orchestra (Beethoven). In the interval: Il Radio-Travaso.
 9.55 p.m. (approx.)—News Bulletin.

SCHENECTADY (U.S.A.)
 General Electric Company (WGY). 790 kc/s (379.5 m.); 50 kW. Relayed at intervals by W2XAF on 9,530 kc/s (31.48 m.) and by W2XAD on 15,340 kc/s (19.56 m.).
 Transmits at intervals from 11.45 a.m.
 11.40 p.m.—Weather Forecast.
 11.44 p.m.—Time Signal.
 11.45 p.m.—New York Relay.
 12 midnight.—Pro-Joy Dinner Dance Orchestra.
 12.30 a.m. (Friday).—Programme

from New York. In the interval at 4.0 a.m.—Organ Recital from the Ritz Theatre, Albany, N.Y.
 5.0 a.m. (approx.)—Close Down.

STOCKHOLM (Sweden)
 Radiotjänst (SASA). 689 kc/s (436 m.); 75 kW. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 222.5 kc/s (1,348 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).
 Transmits at intervals from 6.15 a.m.
 6.15 p.m. (from Uppsala, 662 kc/s (453.2 m.).—A Public Discussion: The Problems of Peace among the Workers.
 8.15 p.m.—Weather and News.
 8.40 p.m. (from Malmö, 1,301 kc/s, 231 m.).—Talk: The History of the Russian Revolution.
 9.10 p.m.—Orchestral Concert. Overture, "The Black Domino" (Auber) Andante from the Concerto for Flute in D Major (Mozart). Spanish Caprice (Rimsky-Korsakoff). Selection from "No, No, Nanette" (Youmans).
 10.0 p.m. (approx.)—Close Down.

STRASBOURG (France)
 Radio-Strasbourg (P.T.T.) 869 kc/s (346 m.); 15 kW.
 Transmits at intervals from 11.0 a.m.
 6.0 p.m.—Talk in German: Health in Winter.
 6.15 p.m.—Gramophone Records.
 7.15 p.m.—News in French and German.
 7.30 p.m.—Instrumental Concert.
 8.30 p.m.—Classical Concert
 10.30 p.m. (approx.)—Close Down.

STUTTGART (Germany)
 Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.7 kW. Relayed by Freiburg, 527 kc/s (570 m.).
 Transmits at intervals from 5.15 a.m.
 6.0 p.m.—Time Signal.
 6.5—11.0 p.m.—See Frankfurt Programme.
 9.30 p.m. (in an interval).—Programme Announcements and News.
 11.0 p.m. (approx.)—Close Down.

TOULOUSE (France)
 Radiophonie du Midi. 779 kc/s (385 m.); 8 kW.
 Transmits at intervals from 1.0 p.m.
 6.15 p.m.—Exchange Quotations.
 6.30 p.m.—Dance Music Programme.
 6.45 p.m.—Market Prices.

6.55 p.m.—Gramophone Concert.
 7.30 p.m.—News Bulletin.
 9.0 p.m.—Concert of Opera Music. Overture, "Le Roi d'Ys" (Lalo). Selections from "Hérodiade" (Massenet), "Aida" (Verdi), "Faust" (Gounod), "Cléopâtre" (Massenet), "Thaïs" (Massenet), "Médon" (Massenet), and "Lakmé" (Delibes).
 11.15 p.m.—North African News.
 11.30 p.m.—Concert by a Viennese Orchestra.

12 midnight.—News and Close Down.
VIENNA (Austria)
 Radio-Wien. 581 kc/s (516.3 m.); 20 kW. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
 Transmits at intervals from 8.20 a.m.
 6.0 p.m.—Talk: Modern Advertisement and its Illustration.
 6.30 p.m.—Time, Weather and Programme Announcements.
 6.35 p.m.—Concert of Light Music. Overture, "Maritana" (Wallace). Waltz, Neu-Wien (Joh. Strauss). Selection from "Aida" (Verdi). Violin Solo: Hejre Kati (Hubay). Italian Caprice (Tchaikovsky).

7.30 p.m.—"Three Epitaphs"—A Radio Sequence in Three Sketches (Ossip Dymow), arranged for the Wireless by Carl Behr.
 8.30 p.m.—"Who spoke?"—A Surprise Programme.
 9.0 p.m.—News Bulletin.
 9.5 p.m.—Concert of Light Music.

WARSAW (Poland)
 Polskie Radio. 212 kc/s (1,411 m.); 14 kW.
 Transmits at intervals from 10.40 a.m.
 6.25 p.m.—Gramophone Records.
 6.35 p.m.—Radio Journal.
 6.55 p.m.—Gramophone Records.
 7.0 p.m.—Talk by Dr. J. Gajkowski.
 7.15 p.m.—Wireless Talk.
 7.30 p.m.—Vocal and Orchestral Concert. In the interval, Programme Announcements and Theatre Review.

8.30 p.m.—"The Sailor"—Play (Szaniawski), arranged for the Wireless by Dunin-Karwicki).
 9.15 p.m.—Violin Recital.
 9.50 p.m.—Weather, Police and Sports Notes.
 10.0 p.m.—Dance Music Programme.
 11.0 p.m. (approx.)—Close Down.

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PROGRAMMES FOR FRIDAY (November 14)

NOTE: THE HOURS OF TRANSMISSION ARE REFERRED TO GREENWICH MEAN TIME

ALGIERS (N. Africa)

825.3 kc/s (363.4 m.); 13 kW.
Transmits at intervals from 12.30 p.m.
7.15 p.m.—Recital of Russian Songs.
7.30 p.m.—News Bulletin.
7.45 p.m.—Accordion Solos.
8.0 p.m.—Light Music.
8.15 p.m.—Mandoline and Guitar Recital.
8.30 p.m.—Agricultural Report.
8.45 p.m.—Concert from the Works of Gounod.
9.45 p.m.—News Bulletin.
10.0 p.m.—Concert of Light Music.
10.45 p.m.—News Bulletin.

BARCELONA (Spain)

Radio-Barcelona (EAJ1) 860 kc/s (349 m.); 8 kW.
Transmits at intervals from 8.0 a.m.
6.0 p.m.—Programme for Women.
6.40 p.m.—Frio Music and News.
7.0 p.m.—Gramophone Records.
8.30 p.m.—Elementary French Lesson.
9.0 p.m.—Chimes, Weather and Exchange.
9.5 p.m.—Orchestral Selections.
9.45 p.m.—Topical Talk in Catalan.
10.0 p.m.—News Bulletin.
10.5 p.m.—Concert from the Café Español.
12 midnight (approx.)—Close Down.

BERLIN (Germany)

Königs Wusterhausen. 183 kc/s (1,635 m.); 35 kW.
Transmits at intervals from 5.25 a.m.
3.30 p.m.—Programme from Leipzig.
4.40 p.m.—Talk: Zig-zag Paths in Human Development.
5.0 p.m.—Talk: The Market for Raw Materials and its International Outlook.
5.30 p.m.—Educational Talk: Vulcanism and Earthquakes.
6.0 p.m.—Advanced English Lesson.
6.30 p.m.—Talk for Dentists.
6.55 p.m.—Weather for Farmers.
7.0 p.m.—Programme from Hamburg.
9.0 p.m.—News and Dance Music, relayed from Berlin (Witzleben).
11.30 p.m. (approx.)—Close Down.

BERLIN (Germany)

Witzleben. 716 kc/s (418 m.); 1.7 kW.
Transmits at intervals from 6.0 a.m.
5.45 p.m.—Recital of Hungarian Folk Songs.
6.10 p.m.—Hermann Eris Busc (Schünemann Prize Winner for 1930), reads from his own Poems.
6.30 p.m.—"The Vice Admiral"—Opera in Two Parts (Millöcker).
8.20 p.m.—News; Sports Notes.
8.30 p.m.—Talk: First live, then write.
8.50 p.m.—Concerto for 'Cello and Orchestra, Op. 104 (Dvorak).
9.30 p.m.—Weather, News and Sports Notes, followed by Concert of Light Music from the Hotel Esplanade.
11.30 p.m. (approx.)—Close Down.

BERNE (Switzerland)

Radio-Bern. 743 kc/s (403 m.); 1.1 kW.
Transmits at intervals from 11.43 a.m.
6.28 p.m.—Time and Weather.
6.30 p.m.—Talk: Style in Improvised Speeches.
7.0 p.m.—Chamber Music.
7.40 p.m.—Orchestral Concert from the Kursaal.
8.0 p.m.—Song Recital from the Works of Schubert.
8.25 p.m.—Orchestral Concert.
9.0 p.m.—News, Weather and Special Meteorological Forecast.
9.20 p.m.—Programme Announcements in Esperanto.
9.25 p.m. (approx.)—Close Down.

BRATISLAVA (Czechoslovakia)

1,076 kc/s (279 m.); 14 kW.
Transmits at intervals from 10.30 a.m.
6.35 p.m.—Programme from Brno.
7.0 p.m.—Programme from Prague.
8.0 p.m.—Programme from Brno.
9.0 p.m.—Programme from Prague.
9.15 p.m.—Programme Announcements.
9.20 p.m.—Programme from Moravská-Ostrava.

BRUNNEN (Germany)

023 kc/s (325 m.); 1.7 kW. Relayed by Gleiwitz, 1,157 kc/s (259 m.).
Transmits at intervals from 10.15 a.m.
6.2 p.m.—Orchestral Concert.
6.40 p.m.—Talk: The Constitution.
7.10 p.m.—(from Gleiwitz)—Introductory Talk to the following Transmission.

7.15 p.m.—"Das Veilchen vom Montmartre"—Operetta in Three Acts (Kálmán), relayed from the Municipal Theatre, Beuthen.

9.20 p.m. (in an interval)—Time, Weather, News, Sports Notes and Programme Announcements.
10.15 p.m.—Sound Film News from the Ufa Theatre.

BRNO (Czechoslovakia)

878 kc/s (342 m.); 3 kW.
Transmits at intervals from 10.15 a.m.
6.35 p.m.—(Talk to be announced).
7.0 p.m.—Programme from Prague.
8.0 p.m.—Literary and Musical Programme in Memory of Komenský on the 260th Anniversary of his Death.

9.0 p.m.—Programme from Prague.
9.15 p.m.—News and Theatre Review.

9.20 p.m.—Programme from Moravská-Ostrava.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1.2 kW.
Transmits at intervals from 2.5 p.m.
6.30 p.m.—Colonial Report in Flemish.
6.35 p.m.—Gramophone Concert.
7.30 p.m.—Journal Parlé.
8.10 p.m.—Talk: The League of Nations and Intellectual Co-operation.
8.15 p.m.—Special Concert.
10.15 p.m.—News Bulletin. At 8.15 p.m. (on 338.2 m.)—Concert arranged by the Flemish Socialist Radio Club of Antwerp (SAROV).

BUCHAREST (Romania)

Radio-Bucarest. 761 kc/s (394 m.); 16 kW.
Transmits at intervals from 11.0 a.m.
6.30 p.m.—Gramophone Records.
7.0 p.m.—Opera Programme. In the interval, News Bulletin.

BUDAPEST (Hungary)

545 kc/s (550 m.); 23 kW.
Transmits at intervals from 8.15 a.m.
6.0 p.m.—Military Band Concert.
7.10 p.m.—Recital of Hungarian Songs.
8.0 p.m.—Programme by Herr. A. Odry of the National Theatre.
8.30 p.m.—Vocal and Instrumental Concert, followed by Gramophone Records.

COLOGNE (Germany)

Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 1.7 kW.
See Langenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 1 kW. Relayed by Kalundborg, 260 kc/s (1,153 m.).
Transmits at intervals from 6.30 a.m.
2.0 p.m.—Concert from the Hotel d'Angleterre.
2.45 p.m. (in the interval)—Recital of Songs.
4.0 p.m.—Programme for Boys.
4.40 p.m.—Exchange; Fish Market Prices.
4.50 p.m.—(From the Esbjerg Studio) Talk: The Crisis in Imperialism.
5.20 p.m.—German Language Lesson.
5.50 p.m.—Weather and News.
6.15 p.m.—Time Signal.
6.30 p.m.—(From the Aabenraa Studio) Talk: South Jutland's Ecclesiastical History, 1850-1864.
7.0 p.m.—Town Hall Chimes.
7.2 p.m.—Seventh Concert from the Concert Hall Studio, Axelborg. Programme of Austrian Music. Symphony No. 39 in E Flat Major (Mozart). Overture, "A Carnival in Rome" (Joh. Strauss). Waltz, Liebeslieder (Joh. Strauss). Song, Mein Lebenslauf ist Lieb und Lust (Jos. Strauss). Waltz, Roses of the South, and Pizzicato-Polka (Joh. Strauss). Two Songs (Joh. Strauss): (a) Adèle's Song from "Die Fledermaus"; (b) Waltz, Tales from the Vienna Woods. Overture, "Die Fledermaus" (Joh. Strauss).

9.0 p.m.—News and Report of the Christian Listeners' Association.

9.20 p.m.—Dance Music relayed from Nimb's Restaurant.
11.0 p.m. (in the interval)—Town Hall Chimes.
11.30 p.m. (approx.)—Close Down.

CORK (Ireland)

(6CK). 1,337 kc/s (225 m.); 1.5 kW.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.

CRACOW (Poland)

Polskie Radio. 1,229 kc/s (244 m.); 1.5 kW.
Transmits at intervals from 10.40 a.m.
7.0 p.m.—Programme from Warsaw, followed by News and Relay of Foreign Stations.

DUBLIN (Ireland)

(2RN). 725 kc/s (413 m.); 1.5 kW.
1.30 p.m.—Time, Weather, Stock Report and Gramophone Concert.
6.0 p.m.—Gramophone Records.
6.15 p.m.—Programme for Children.
7.0 p.m.—Gramophone Records.
7.20 p.m.—News Bulletin.
7.30 p.m.—Time and Talk on Gardening.
7.45 p.m.—Wireless Society Talk.
8.0 p.m.—Concert of Opera Music.
9.0 p.m.—"Michael" (Tolstoi), by Dorothy Day and Company.
9.30 p.m.—Sponsored Programme.
10.30 p.m.—Time, News, Weather and Close Down.

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.7 kW. Relayed by Cassel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.15 a.m.
6.0 p.m.—Time, Weather and Economic Notes.
6.5—10.30 p.m.—See Stuttgart Programme.
9.0 p.m. (in the interval)—News, Sports Notes and Weather Report.

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.7 kW. Relayed by Bremen, 950 kc/s (315.8 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 530 kc/s (566 m.); and Kiel, 1,292 kc/s (232.2 m.).
Transmits at intervals from 5.20 a.m.
6.0 p.m.—See Berlin (Königs Wusterhausen).
6.25 p.m.—The Consultation Hour of a Veterinary Surgeon, relayed from an Animals' Clinic.
6.50 p.m.—Exchange and Market Prices.

6.55 p.m.—Weather Report.

7.0 p.m.—Concert from the Works of North German Composers, relayed from the Musikhalle.
9.0 p.m.—Weather, Political, Sports and Miscellaneous Notices.

9.20 p.m.—Concert of Light Music. Overture, "The Bird Fancier" (Zeller). The Second Waltz Potpourri (Robrecht). Glow-Worm Idyll (Lincke). Dance of the Hours from "La Gioconda" (Ponchielli). Tango, Lebe wohl, Matrose (Reich). Foxtrot, Mein kleines Lied und Du (Heimann). Foxtrot, Reminiscing (Edgar Leslie). Selection from "Gipsy Love" (Lehár). March, Wir 13 Mann (Benatzky). Waltz, Der lustige Hannoveraner (Schmid-Köthen).

HILVERSUM (Holland)

1,004 kc/s (298.8 m.); 8.5 kW.
7.40—11.40 a.m.—Programme of the Workers' Radio Society (V.A.R.A.).
7.40—9.35 a.m.—Gramophone Records.
9.55 a.m.—Recitations.
10.10 a.m.—Music and Recitations.
11.10 a.m.—Gramophone Records.
11.40 a.m.—3.40 p.m.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.).
11.40 a.m.—Time Signal.
11.41 a.m.—Orchestral Concert.

1.45 p.m.—Programme for Schools.

2.10 p.m.—Gramophone Records.
2.40 p.m.—Quintet Concert.
3.40—7.40 p.m.—Programme of the V.A.R.A.
3.40 p.m.—Gramophone Records.
4.25 p.m.—Tales for Children.
5.10 p.m.—Organ Recital.
5.40 p.m.—Afternoon Concert.
6.35 p.m.—Two Talks.
6.55 p.m.—Literary Talk.
7.40—10.40 p.m.—Programme of the Liberal Protestant Radio Society (V.P.R.O.). Vocal and Instrumental Concert, with Addresses.
10.40—11.40 p.m.—Gramophone Records of the V.A.R.A. Gramophone Records.
11.40 p.m. (approx.)—Close Down.

HUIZEN (Holland)

160 kc/s (1,875 m.); 8.5 kW.
7.55 a.m. till Close Down.—Programme of the Christian Radio Society (N.C.R.V.).
7.55—9.10 a.m.—Morning Concert on Gramophone Records.
10.10 a.m.—Service for Hospitals.
10.40 a.m.—Gramophone Records.
11.40 a.m.—Police Notes.
12.10 p.m.—Instrumental Concert.
1.40 p.m.—Concert of Classical Music on Gramophone Records.
3.10 p.m.—Instrumental Concert.
4.40 p.m.—Gramophone Records.
4.55 p.m.—Organ Recital from the Westerkerk, Enkhuizen.
5.55 p.m.—A Visit from the Radio Doctor.
6.25 p.m.—Elementary English Lesson.
6.55 p.m.—Talk: The Rose Garden.
7.25 p.m.—Police Notes.
7.40 p.m.—Concert. Prelude in B flat

Minor for Organ (Sach). A Selection for Violin and Organ. Three Songs with Organ accompaniment: (a) Passionslied, (b) Jesus in Gethsemane, (c) Der Tag des Weltgerichts (Ph. Em. Bach). Address: The Education of the Worker. Chorale No. 1 for Organ (Franck). Selection for Violin and Organ. Recitative and Aria with Violin obbligato from the Cantata No. 32, "Liebster Jesu, mein Verlangen" (Bach). Canonetta for Organ (Reger). Selection for Violin and Organ. Three Sacred Songs with Organ accompaniment (Brahms). First Part of Sonata No. 12 for Organ (Rheinberger).

10.10 p.m.—News Bulletin.

10.20 p.m.—Gramophone Records.

11.10 p.m. (approx.)—Close Down.

KALUNDBORG (Denmark)

Kalundborg Radio. 260 kc/s (1,153 m.); 10 kW.
See Copenhagen Programme.

KATOWICE (Poland)

Polskie Radio. 734 kc/s (408 m.); 16 kW.

Transmits at intervals from 10.40 a.m.

6.0 p.m.—Miscellaneous Announcements, Programme Notes, Theatre Review and Amusement Guide.

6.15 p.m.—Talk: In the Realm of Nature.

6.35 p.m.—News and Weather.

7.0 p.m.—Talk on Music.

7.15 p.m.—Symphony Concert, relayed from the Philharmonie, followed by Meteorological Report, Programme Announcements in French and Concert.

10.0 p.m.—The Letter Box in French.

KAUNAS (Lithuania)

Radio Kaunas. 155 kc/s (1,935 m.); 7 kW.

Transmits at intervals from 11.0 a.m.

7.10 p.m.—Talk. The Festival in Memory of Vytautas the Great.

7.30 p.m.—Talk on Physical Exercise.

7.50 p.m.—Concert of Slavonic Music.

8.45 p.m.—News in Esperanto.

9.0 p.m.—Ukrainian Programme.

KÖNIGSBERG (Germany)

Ostmarken Rundfunk. 1,085 kc/s (276 m.); 1.7 kW. Relayed by Danzig, 662 kc/s (453 m.).

Transmits at intervals from 5.30 a.m.

6.0 p.m.—(from Danzig)—Advanced French Lesson.

6.25 p.m.—Weather Report.

6.30 p.m.—Jakob Schaffner reads from his own Works.

7.10 p.m.—"Gipsy Love"—Opera in Three Acts (Lehar).

9.15 p.m.—Weather, News and Sports Notes.

9.30 p.m.—Musical Programme.

10.30 p.m. (approx.)—Close Down.

LAHTI (Finland)

167 kc/s (1,706 m.); 54 kW.

Transmits at intervals from 10.0 a.m.

6.5 p.m.—Songs (Grieg).

6.30 p.m.—Vocal and Orchestral Concert, relayed from Helsingfors 1,355 kc/s (221 m.).

7.45 p.m.—News in Finnish and Swedish and Close Down.

LANGENBERG (Germany)

Westdeutscher Rundfunk. 635 kc/s (473 m.); 17 kW. Relayed by Aachen, Cologne and Münster, 1,319 kc/s (227 m.).

Transmits at intervals from 5.45 a.m.

6.0 p.m.—Report on Economics, Weather and Sports Notes.

6.15 p.m.—English Conversation.

6.40 p.m.—Talk: Accident Insurance.

7.0 p.m.—Concert of Light Orchestral Music. Overture, "Das Nachtlager in Granada" (Kreutzer).

Scenes from "La Bohème" (Puccini). Piedmontese Dances (Simagaglia). The Second Hungarian Rhapsody (Liszt). Waltz from "Der Rosenkavalier" (R. Strauss).

Interlude: New Poetry in Music. A Wedding: Day on Troldhaugen (Grieg). Suite from "The Snow Maiden" (Rimsky-Korsakov).

Waltz, Neu-Wien (Joh. Strauss). Kamarinskaja, Fantasia on Two Russian Songs (Glinka).

8.0 p.m. (approx.)—News Bulletin.

After the Programme: News, Sports and Miscellaneous Notices, followed by Concert from the Café Victoria, Hagen.

11.0 p.m. (approx.)—Close Down.

LEIPZIG (Germany)

Mitteldeutscher Rundfunk. 1,184 kc/s (253 m.); 2.3 kW. Relayed by Dresden, 941 kc/s (319 m.).

Transmits at intervals from 9.0 a.m.

3.30 p.m.—Orchestral Concert. Four Pieces for String Orchestra (Juon): (a) Kleine Ballade, (b) Intermezzo, (c) Elegy, (d) Dance. Selections from the Divertimento for Wind Instruments (Gál): (a) Pagliazzo,

(b) Cavatina, (c) Intermezzo grazioso. Variations on a Theme by Mozart, for String Orchestra (Gress). Bagpipe, for Wind Instruments (Nielsen). Elegiac Suite for String Orchestra (Rangström): (a) Visionary Prelude, (b) Scherzo, (c) Melancholy Canzonetta, (d) Fantastic Jig.

4.55 p.m.—Economic Notes.

5.5 p.m.—Esperanto Language Lesson.

5.20 p.m.—Weather and Time.

5.25 p.m.—English Language Lesson.

6.0 p.m.—"Anxiety"—a Psychological Investigation.

6.30 p.m.—Concert from the Works of Gilbert.

8.0 p.m.—"The Crime of Jonathan Bradford"—Wireless Play (Ernst Sander).

9.0 p.m.—Debate on Films.

9.20 p.m.—Time, Weather, News and Light Music on Gramophone Records.

11.0 p.m. (approx.)—Close Down.

LJUBLJANA (Yugoslavia)

Radio-Ljubljana. 522 kc/s (574.7 m.); 2.8 kW.

Transmits at intervals from 11.15 a.m.

6.30 p.m.—Programme for Women.

7.0 p.m.—Wind-Instrument Concert.

8.0 p.m.—Orchestral Concert.

9.0 p.m.—Weather and News Bulletin.

MADRID (Spain)

Union Radio (EAJ7). 707 kc/s (424 m.); 2 kW.

Transmits at intervals from 8.0 a.m.

7.0 p.m.—Chimes, Exchange Quotations, Market Prices and Theatre Review.

7.30 p.m.—Dance Music Programme.

8.0 p.m.—Educational Talk.

8.25 p.m.—News Bulletin.

8.30—9.45 p.m.—Interval.

9.45 p.m.—Lesson in English Pronunciation.

10.0 p.m.—Chimes, Time and Gramophone Concert of Symphony Music.

12 midnight.—Chimes, News and Dance Music.

12.30 a.m. (Saturday)—Close Down.

MILAN (Italy)

Ente Italiano Audizioni Radiofoniche. 599 kc/s (501 m.); 8.5 kW. Programme relayed by Turin, 1,098 kc/s (273.2 m.); and Genoa, 788 kc/s (381 m.).

Transmits at intervals from 7.15 a.m.

6.20 p.m.—Announcements.

6.30 p.m.—Concert of Light Music.

7.15 p.m.—Giornale radio; Weather.

7.30 p.m.—Time Signal.

7.32 p.m.—Dance Music Programme.

8.0 p.m.—Symphony Concert. Overture, "Der Schauspieler" (Mozart). Summer Concerto (Pizzetti). Selection (Romano).

In the Interval, Talk: From Near and Far.

9.0 p.m.—Comedy Programme.

9.30 p.m.—Variety Items.

10.0 p.m.—Giornale radio, followed by Relay of Dance Music from the Cova Restaurant.

10.55 p.m.—News Bulletin.

11.0 p.m. (approx.)—Close Down.

MORAVSKÁ-OSTRAVA (Czechoslovakia)

1,139 kc/s (263 m.); 11 kW.

Transmits at intervals from 10.0 a.m.

6.35 p.m.—Programme from Brno.

7.0 p.m.—Programme from Prague.

8.0 p.m.—Programme from Brno.

9.0 p.m.—Programme from Prague.

9.15 p.m.—Programme Announcements and Theatre Review.

9.20 p.m.—Orchestral Concert.

MOTALA (Sweden)

222.5 kc/s (1,348 m.); 40 kW.

See Stockholm Programme.

MUNICH (Germany)

563 kc/s (533 m.); 1.7 kW. Relayed by Augsburg, 536 kc/s (560 m.); Kaiserslautern, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (239 m.).

Programmes for Friday—(Cont.)

Transmits at intervals from 9.0 a.m.
 6.15 p.m.—Weather and News.
 6.30 p.m.—English Language Lesson.
 7.0 p.m.—Time Signal.
 7.2 p.m.—Literary Review.
 7.30 p.m.—Concert from the Works of Arne Eggen, with the collaboration of the Composer.
 8.30 p.m.—News and Announcements.
 8.40 p.m.—News, Press Review and Weather.
 8.50 p.m.—Topical Talk.
 9.5 p.m.—Talk relayed from Bergen, 324 kc/s (364 m.).
 9.35 p.m. (approx.).—Close Down.

PARIS (France)
 Eiffel Tower (FL). 207 kc/s (1,445 m.); 15 kW.
 7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
 9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
 5.45 p.m.—Le Journal Parlé.
 7.10 p.m.—Meteorological Forecast.
 7.20 p.m.—Symphony Concert. Selection from "Beric Godounoff" (Moussorgsky). Chant des Bateliers (Glazounoff-Leopold). Pastels chantants (Flament). Schatzwalzer (Joh. Strauss). At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
 8.30 p.m.—Light Variety Concert.
 10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)
 Poste Parisien. 914 kc/s (329 m.); 1.2 kW.
 9.0 a.m.—Transmission of Pictures.
 7.25 p.m.—Gramophone Records and News Bulletin.
 8.0 p.m.—Dance Music Programme.

PARIS (France)
 Radio-Paris (CFR). 174 kc/s (1,725 m.); 17 kW.
 Transmits at intervals from 6.45 a.m.
 12.30 p.m.—Gramophone Concert.
 In the intervals at 1.0 p.m.—Exchange Quotations and News; and at 1.30 p.m.—Exchange Quotations.
 2.0 p.m.—Exchange; Market Prices.
 3.30 p.m.—Exchange Quotations.
 3.45 p.m.—Gramophone Concert.
 4.30 p.m.—Talk: Great Musical Epochs—the Middle Ages and the Renaissance.
 4.55 p.m.—News and Exchange Quotations.

6.0 p.m.—Agricultural Report and Racing Results.
 6.25 p.m.—New York Exchange Rates.
 6.30 p.m.—Gramophone Records.
 7.0 p.m.—Talk: Madagascar in the Colonial Exhibition.
 7.30 p.m.—Elementary English Lesson.
 7.45 p.m.—Commercial Prices, Economic and Social Notes and News.
 8.0 p.m.—Talk with Gramophone Illustrations: Charles Lecocq.
 8.30 p.m.—Sports Review.
 8.45 p.m.—"Mireille"—Operain Five Acts (Gounod) for Soloists, Choir and Orchestra. In the interval at 9.15 p.m.—Press Review, News and Time Signal.

POZNAŃ (Poland)
 896 kc/s (335 m.); 1.9 kW.
 Transmits at intervals from 6.15 a.m.
 7.0 p.m.—Advanced English Lesson.
 7.15 p.m.—Programme from Warsaw.
 9.0 p.m.—Time, News, Sports and Police Notes.
 9.15 p.m.—Dance Music from the Café Esplanade.
 11.0 p.m. (approx.).—Close Down.

PRAGUE (Czechoslovakia)
 Stranice. 617 kc/s (487 m.); 5.5 kW.
 Transmits at intervals from 10.15 a.m.
 6.20 p.m.—Talk: Arteriosclerosis.
 6.36 p.m.—Concert of Oriental Music with Introductory Talk.
 7.0 p.m.—Concert from the Lucerna Palace.
 8.0 p.m.—Programme from Brno.
 9.0 p.m.—Time, News and Sports Notes.
 9.15 p.m.—News, Theatre Review and Programme Announcements.
 9.20 p.m.—Programme from Moravská-Ostrava.
 10.0 p.m.—Time, News and Chimes.

RIGA (Latvia)
 Radio Riga. 572 kc/s (525 m.); 13 kW.
 Transmits at intervals from 10.0 a.m.
 6.3 p.m.—Symphony Concert. Symphony in E Minor, No. 1 (Kalinnikoff). Songs. Fantasia for Piano and Orchestra (Debussy). Fairy Tales (Enn). In the intervals at 7.0 p.m.—News, and at 8.0 p.m.—Meteorological Report.
 8.30 p.m.—Concert of Talkie Music.
 9.0 p.m. (approx.).—Close Down.

ROME (Italy)
 Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 75 kW. Relayed by Naples, 905 kc/s (332 m.), and Prato Smeraldo, 11,804 kc/s (25.4 m.).
 Transmits at intervals from 7.15 a.m.
 6.45 p.m.—Giornale radio, News, Sports Notes, Announcements and Press Review.
 7.30 p.m.—Time Signal.
 7.32 p.m.—Dance Music Programme.
 8.5 p.m.—"Paganini"—Operetta in Three Acts (Lehar). In the intervals, Humorous Talk and Talk on Literature and Art.
 9.55 p.m. (approx.).—Close Down.

SCHENECTADY (U.S.A.)
 General Electric Company (WGY). 790 kc/s (379.5 m.); 50 kW. Relayed at intervals by W2XAF on 9,530 kc/s (31.48 m.), and by W2XAD on 15,340 kc/s (19.56 m.).
 Transmits at intervals from 11.45 a.m.
 11.0 p.m.—News, Stock and Exchange Quotations.
 11.20 p.m.—Time Signal.
 11.30 p.m.—New York Relay.
 12 midnight.—Weather Forecast.
 12.1 a.m. (Saturday).—Programme Announcements.
 12.5 a.m.—Joseph Kreinin (Violinist).
 12.14 a.m.—Time Signal.
 12.15 a.m.—WGY Players.
 12.45 a.m.—Duofold Programme.
 1.0 a.m.—WGY Concert Hour.
 2.0 a.m.—Programme from New York.
 3.0 a.m.—Broadway Classics.
 3.30 a.m.—New York Relay.
 4.0 a.m.—Doc Peyton and the Kenmore Hotel Orchestra from Albany, N.Y.
 5.0 a.m. (approx.).—Close Down.

STOCKHOLM (Sweden)
 Radiotjänst (SASA). 689 kc/s (436 m.); 75 kW. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 222.5 kc/s (1,348 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).
 Transmits at intervals from 6.15 a.m.
 6.0 p.m. (from Göteborg).—Talk: Good and Bad Swedish.
 6.30 p.m.—Concert of Military Band Music.
 7.20 p.m.—Recital of English Songs, by John Armstrong. Three Songs (Purcell): (a) Thy Hand, Belinda, and (b) When I am laid in Earth

from "Dido and Æneas," (c) There's not a Swain on the Plain. Orpheus with his Lute (William Linley). Modern Songs (Delius): (a) Irmelin, (b) Spring Song. Folk Songs: (a) Thou gentle dove (arr. E. T. Davies), (b) When Harry the Tailor (arr. R. Vaughan Williams), (c) Abroad as I was walking (arr. Gustav Holst), (d) O rare Turpin (arr. Herbert Wiseman).
 7.45 p.m.—Talk: The Decline of the Birth Rate and its Consequences.
 8.15 p.m.—Weather and News.
 8.40 p.m.—Road Report by the Royal Automobile Club.
 8.45 p.m.—Elementary French Lesson relayed from Malmö 1,301 kc/s (231 m.).
 9.15 p.m.—Concert of Light Music.
 10.0 p.m. (approx.).—Close Down.

STRASBOURG (France)
 Radio-Strasbourg (PTT). 869 kc/s (346 m.); 15 kW.
 Transmits at intervals from 11.0 a.m.
 6.0 p.m.—Talk in German.
 6.15 p.m.—Instrumental Concert. In the interval at 7.15 p.m.—News in French and German.
 8.30 p.m.—Alternate Relay of Music from the Cafés de la Paix and de l'Odéon.
 10.30 p.m. (approx.).—Close Down.

STUTTGART (Germany)
 Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.7 kW. Relayed by Freiburg, 527 kc/s (570 m.).
 Transmits at intervals from 5.15 a.m.
 6.0 p.m.—Time and Review of the Principal Events of the Coming Week in Esperanto.
 6.5 p.m.—Talk: The Crisis in International Trade.
 6.30 p.m.—Unknown Worker-Writers—a Literary Recital by Ernst Stockinger, with Gramophone Records of a Workers' Choir.

7.0 p.m.—Symphony Concert by the Philharmonic Orchestra, relayed from the Liederhalle. Symphony No. 5 in C Minor, Op. 67 (Beethoven). Aria from "Zaida" (Mozart). Aria from "The Marriage of Figaro" (Mozart). Overture and Bacchanal from "Tannhäuser" (Wagner). Ocean Aria from "Oberon" (Weber). Polou-sian Dances from "Prince Igor" (Borodin).
 9.0 p.m.—Programme Announcements, News and Sports Notes.

9.30 p.m.—Dance Music from the Cafaso, Mannheim.
 10.30 p.m.—(approx.).—Close Down.
TOULOUSE (France)
 Radiophonie du Midi. 779 kc/s (385 m.); 8 kW.
 Transmits at intervals from 1.0 p.m.
 6.15 p.m.—Exchange Quotations.
 6.30 p.m.—Dance Music Programme.
 6.45 p.m.—Market Prices.
 6.55 p.m.—Concert by a Symphony Orchestra.

7.30 p.m.—News Bulletin.
 7.45 p.m.—Concert of Light Music.
 8.0 p.m.—Selections by an Argentine Orchestra.
 8.25 p.m.—Gramophone Concert.
 8.55 p.m.—Fashion Notes.
 9.0 p.m.—Time and Concert from the Café des Américains.
 11.0 p.m.—Concert by a Viennese Orchestra, followed by Military Band Music.
 12 midnight (approx.).—News and Close Down.

VIENNA (Austria)
 Radio-Wien. 581 kc/s (516.3 m.); 20 kW. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
 Transmits at intervals from 8.20 a.m.
 6.0 p.m.—Elementary Italian Lesson.
 6.30 p.m.—Time, Weather, and Programme Announcements.
 6.35 p.m.—Concert by the Vienna Male Voice Quartet.
 7.30 p.m.—Talk: Johannes Kepler, on the Third Centenary of his Death.
 8.0 p.m.—Memorial Celebration in honour of Carl Michael Ziehrer, the famous Viennese Composer. Vocal and Instrumental Concert, with Explanatory Notes. News for an interval.

WARSAW (Poland)
 Polskie Radio. 212 kc/s (1,411 m.); 14 kW.
 Transmits at intervals from 10.40 a.m.
 6.10 p.m.—Agricultural Report.
 6.25 p.m.—Gramophone Records.
 6.35 p.m.—Radio Journal.
 6.55 p.m.—Gramophone Records.
 7.0 p.m.—Talk on Music.
 7.15 p.m.—Symphony Concert from the Philharmonic. In the interval, Programme Announcements and Theatre Review. After the Programme, Weather, Police and Sports Notes and Answers to Correspondents.



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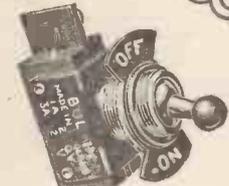
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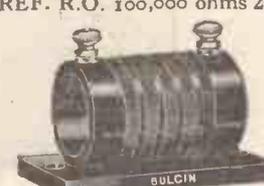
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PROGRAMMES FOR SATURDAY (November 15)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

ALGIERS (N. Africa)

825.3 kc/s (363.4 m.); 13 kW.
Transmits at intervals from 12.30 p.m.
7.0 p.m.—Exchange, Weather, Agricultural Report and Shipping Notes.
7.15 p.m.—Gramophone Records.
7.45 p.m.—News Bulletin.
8.0 p.m.—Variety Programme.
8.30 p.m.—Concert of Old Dances.
8.45 p.m.—Dance Music Programme.
9.0 p.m.—Concert of Opera Music.
9.30 p.m.—Vocal and Instrumental Concert.

BARCELONA (Spain)

Radio-Barcelona (EAJ7). 860 kc/s (349 m.); 8 kW.
Transmits at intervals from 8.0 a.m.
6.0 p.m.—Trio Music and News.
7.0 p.m.—Gramophone Records.
8.30 p.m.—Elementary German Lesson.

9.0 p.m.—Chimes, Weather, Exchange and Agricultural Report.
9.50 p.m.—Concert of Light Music.
10.0 p.m.—News Bulletin.
10.5 p.m.—Programme from Madrid.

BELGRADE (Yugoslavia)

694 kc/s (432.3 m.); 3 kW.
Transmits at intervals from 10.25 a.m.
6.30 p.m.—Talk on France.
7.0 p.m.—Orchestral Selections from "Der Orloff" (Grahichstädten).
7.30 p.m.—Popular Programme relayed from Subotica. In the interval at 8.30 p.m.—News Bulletin.

BERLIN (Germany)

Königs Wusterhausen. 183 kc/s (1,635 m.); 35 kW.
Transmits at intervals from 5.25 a.m.
3.30 p.m.—Programme from Hamburg.
4.30 p.m.—Medical Talk: Twenty Years of Salvarsan.
5.0 p.m.—Advanced French Lesson.
5.25 p.m.—Educational Talk: Goethe's "Faust."
6.0 p.m.—Talk for Workers: Social Service Bureaus.
6.30 p.m.—Programme from Frankfurt.
8.0-1.30 a.m. (Sunday).—Programme relayed from Berlin (Witzleben).

BERLIN (Germany)

Witzleben. 716 kc/s (418 m.); 1.7 kW.
Transmits at intervals from 6.0 a.m.
6.0 p.m.—Recital of Songs.
6.30 p.m.—Dialogue: The Problems of Preliminary Examinations.
7.0 p.m.—Orchestral Concert. Overture, "Maritana" (Wallace). Selection from "Gipsy Love" (Lehár). Torch Dance (Moszkovsky). Overture, "The Bronze Horse" (Auber). Selection from "Alessandro Stradella" (Flotow). Dances (Tchaikovsky). Waltz, Küstlerleben (J. Strauss). Marche militaire (Schubert).
8.0 p.m.—News; Sports Notes.
8.10 p.m.—"The Week-end and Sunshine"—A Variety Programme.
9.30 p.m.—Opera Ball for the Benefit of Charity Funds, relayed from the Sports Palace. Choral and Orchestral Selections. In an interval, Weather, News and Sports Notes.
11.0 p.m.—The German Film Industries Ball, relayed from the Zoological Gardens.
1.0 a.m. (Sunday).—Close Down.

BERNE (Switzerland)

Radio-Bern. 743 kc/s (403 m.); 1.1 kW.
Transmits at intervals from 6.0 a.m.
6.28 p.m.—Time and Weather.
6.30 p.m.—Talk: Plant Life.
7.0 p.m.—Gramophone Concert.
7.50 p.m.—Relay of the 2nd Act of "Oberon"—Opera (Weber), relayed from the Municipal Theatre, Basle, 941 kc/s (319 m.).
9.0 p.m.—News and Weather.
9.15 p.m.—Orchestral Concert.
9.45 p.m.—Dance Music Programme.
11.0 p.m. (approx.).—Close Down.

BRATISLAVA (Czechoslovakia)

1,076 kc/s (279 m.); 14 kW.
Transmits at intervals from 10.30 a.m.
6.20 p.m.—Programme from Prague.
7.30 p.m.—Programme from Brno.
9.0 p.m.—Programme from Prague.
9.20 p.m.—Programme Announcements.
9.25 p.m.—Programme from Moravská-Ostrava.

BRESLAU (Germany)

923 kc/s (325 m.); 1.7 kW. Re-

layed by Gleiwitz, 1,157 kc/s (259 m.).

Transmits at intervals from 10.15 a.m.
6.0 p.m.—"Recapitulation"—A Review of the Talks of the Week and Literary Intelligence.

6.30 p.m.—Weather for Farmers.
6.32 p.m.—Orchestral Concert of Classical Operetta Music. Selection from "La belle Hélène" (Offenbach). Polka-Mazurka from "Der Bettelstudent" (Millocker). Selection from "Gasparone" (Millocker).

7.0 p.m.—That will interest you!—Surprise Programme.

7.30 p.m.—Concert (continued). Overture, "Cagliostro in Wien," Waltz from "The Gipsy Baron," and Selection from "Die Fledermaus" (Joh. Strauss).

8.0 p.m.—Time, Weather, News and Sports Notes.

8.10-11.30 p.m.—Programme from Berlin (Witzleben). In an interval, Time, Weather, News, Sports Notes and Programme Announcements.

11.30 p.m. (approx.).—Silent Night.

BRNO (Czechoslovakia)

878 kc/s (342 m.); 3 kW.
Transmits at intervals from 10.15 a.m.

6.20 p.m.—Orchestral Concert. March (Hrimaly). Polonaise (Dvorák). Waltz and Polka (Fibich). Serenade No. 1 (Zich). Two Serbian Dances (Krstic). Polka (Smetana). Popular Songs and Spanish Dance (Provaznik). Gallop, Guido (Hilmar).

7.10 p.m.—Talk: At the Grave of Komensky.

7.30 p.m.—Humorous Talk.

8.0 p.m.—Military Band Concert from the Café Rosenbreier.

9.0 p.m.—Programme from Prague.

9.20 p.m.—News and Theatre Review.

9.25 p.m.—Programme from Moravská-Ostrava.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1.2 kW.

5.0 p.m.—Gramophone Concert.

5.45 p.m.—Elementary English Lesson.

6.10 p.m.—Advanced English Lesson.

6.30 p.m.—Gramophone Concert.

7.30 p.m.—Le Journal Parlé.

8.10 p.m.—Talk: The League of Nations and Financial Problems.

8.15 p.m.—Concert arranged by "Le Meuse" and "L'Antenne." In the interval, Topical Review.

10.15 p.m.—News Bulletin and Announcements in Esperanto.

BUCHAREST (Romania)

Radio-Bucarest. 761 kc/s (394 m.); 16 kW.

Transmits at intervals from 11.0 a.m.

6.0 p.m.—Gramophone Records.

7.0 p.m.—Opera Transmission. News in the interval.

BUDAPEST (Hungary)

545 kc/s (550 m.); 23 kW.

Transmits at intervals from 8.15 a.m.

6.0 p.m.—The Letter Box.

7.0 p.m.—Song Recital.

8.15 p.m.—Vocal and Orchestral Concert. "Humour in Opera Music." Aria from "The Barber of Seville" (Rossini). Selection from "The Carnival Wedding" (Poldini). Angela's Monologue from "The Black Domino" (Auber). Drinking Song from "Háry János" (Kodály). Drinking Song from "The Merry Wives of Windsor" (Nicolai). Duet from "The Magic Flute" (Mozart). Selection from "Amor Medico" (Wolff-Ferrari). Duet from "The Merry Wives of Windsor" (Nicolai). Quartet (Ferrari); followed by Concert by a Tzigane Orchestra from the Café Spolarich.

COLOGNE (Germany)

Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 1.7 kW.

See Langenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 1 kW.

Relayed by Kalundborg, 260 kc/s (1,153 m.).

Transmits at intervals from 6.30 a.m.

2.30 p.m.—Orchestral Concert.

3.20 p.m. (in the interval).—Reading.

4.40 p.m.—Exchange; Fish Market Prices.

4.50 p.m.—Talk: Guy de Maupassant.

5.20 p.m.—French Language Lesson.

5.50 p.m.—Weather and News.

6.15 p.m.—Time Signal.

6.30 p.m.—Review of Politics for the Past Month.

7.0 p.m.—Town Hall Chimes.

7.2 p.m.—Concert of Old Songs and Melodies.

8.0 p.m.—Reading (Munthe).

8.25 p.m.—News Bulletin.

8.40 p.m.—Concert of Light Music. Reading in the interval.

9.45 p.m.—Dance Music from the Industri Restaurant.

11.0 p.m. (in the interval).—Town Hall Chimes.

11.15 p.m. (approx.).—Close Down.

CORK (Ireland)

(6CK). 1,337 kc/s (225 m.); 1.5 kW.

1.30 p.m.—Weather Forecast and Gramophone Selections.

7.20 p.m.—Programme from Dublin.

CRACOW (Poland)

Polkie Radio. 1,229 kc/s (244 m.); 1.5 kW.

Transmits at intervals from 10.40 a.m.

7.0 p.m.—Programme from Warsaw. Two Talks and Concert of Light Music. After the Concert, Talk, News and Dance Music Programme.

11.0 p.m. (approx.).—Bugle Call from The Tower of St. Mary's Church.

DUBLIN (Ireland)

(2RN). 725 kc/s (413 m.); 1.5 kW.

1.30 p.m.—Time, Weather and Gramophone Concert.

7.20 p.m.—News Bulletin.

7.30 p.m.—Time Signal.

7.32 p.m.—Travel Talk.

7.45 p.m.—Irish Lesson.

8.0 p.m.—Opera Relay by the Augmented Station Orchestra, Opera Chorus and Soloists under the direction of Mr. Vincent O'Brien.

10.30 p.m.—Time, News, Weather and Close Down.

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.7 kW.

Relayed by Cassel, 1,220 kc/s (246 m.).

Transmits at intervals from 5.15 a.m.

6.0 p.m.—Time, Weather and Economic Notes.

6.5 p.m.—Spanish Language Lesson.

6.30 p.m.—Concert from the Works of Richard Wagner. Overture and Scata's Ballad from "The Flying Dutchman." Prelude and Love Duet from "Lohengrin." Bachanal and Rome Narrative from "Tannhäuser." Prelude to the Third Act of "The Mastersingers."

8.0 p.m.—Variety Programme.

9.0 p.m.—News, Sports Notes and Weather.

9.30 p.m.—See Berlin (Witzleben).

11.30 p.m. (approx.).—Close Down.

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.7 kW.

Relayed by Bremen, 950 kc/s (315.8 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 530 kc/s (566 m.); and Kiel, 1,292 kc/s (232.2 m.).

Transmits at intervals from 5.20 a.m.

3.0 p.m.—Concert of Light Music. Wedding March, Op. 110, No. 4 (Bossi). Waltz, Märchen aus dem Orient (Joh. Strauss). Fantasia on Motives from "Tip-Toes" (Gershwin). Lyric Scene (Huppertz). Serenade, Ay, Ay, Ay (Perez Freire). In the Garden of Eden (Huppertz). Oriental Fantasia (Lange). Sylphe (Huppertz). Tango from "Es liegt in der Luft" (Spoliansky). Slow Fox, trot from "The Five Wishes" (Benatzky). Selection from "Jonny spielt auf" (Krenek).

4.30 p.m.—A Trip through the Balkans, in Word, Music and Picture—Back from Hungary.

5.15 p.m.—Sponsored Concert.

6.0 p.m.—Concert from the Café Walhof.

6.55 p.m.—Weather Report.

7.0 p.m.—"Good Form in all Conditions of Life"—a Gramophone Cabaret.

8.0 p.m.—The November Ball—Concert by the Scarpa Orchestra.

9.20 p.m.—Topical Programme.

9.50 p.m.—The November Ball (contd.).

HILVERSUM (Holland)

1,004 kc/s (298.8 m.); 8.5 kW.

7.40 a.m. till Close Down.—Programme of the Workers' Radio Society (V.A.R.A.).

7.40 a.m.—Organ Recital.

8.40 a.m.—Gramophone Records.

9.55 a.m.—Recitations.

10.10 a.m.—Concert and Recitations.

11.10 a.m.—Gramophone Records.

11.40 a.m.—Morning Concert.

1.25 p.m.—Songs for Children.

2.25 p.m.—Afternoon Concert.

4.10 p.m.—Exchange Quotations.

4.40 p.m.—Talk: Our House.

5.10 p.m.—Talk (to be announced).

5.50 p.m.—Programme for Children.

6.50 p.m.—News Bulletin.

7.5 p.m.—Accordion Recital.

7.25 p.m.—Humorous Talk.

7.40 p.m.—Concert and Talk.

8.40 p.m.—Concert.

9.40 p.m.—Accordion Recital.

10.0 p.m.—Talk (to be announced).

10.10 p.m.—Concert.

10.40 p.m.—News Bulletin.

10.55 p.m.—Gramophone Records.

11.40 p.m. (approx.).—Close Down.

HUIZEN (HOLLAND)

160 kc/s (1,875 m.); 8.5 kW.

7.40 a.m. till Close Down.—Programme of the Catholic Radio Society (K.R.O.).

7.40-8.55 a.m.—Morning Concert.

11.10 a.m.—Religious Address by the Rev. Perquin.

11.40 a.m.—Time; Police Notes.

11.55 a.m.—Sextet Concert.

1.25 p.m.—Gramophone Records.

2.10 p.m.—Question Time for Young People.

2.40 p.m.—Programme for Children.

3.55 p.m.—Programme to be announced.

4.10 p.m.—Talk: The Roman Catholic Book Trade.

4.40 p.m.—Gramophone Records.

5.40 p.m.—Sports Talk: Does Professional Sport pay?

5.55 p.m.—Weekly Press Review.

6.15 p.m.—Gramophone Records.

6.25 p.m.—Esperanto Lesson.

6.55 p.m.—Talk: Religion and Morality in Modern Greece.

7.25 p.m.—Police Notes.

7.40 p.m.—Concert of Light Vocal and Instrumental Music.

9.10 p.m. (in the interval).—News Bulletin.

10.40 p.m.—Gramophone Records.

11.40 p.m. (approx.).—Close Down.

KALUNDBORG (Denmark)

Kalundborg Radio. 260 kc/s (1,153 m.); 10 kW.

See Copenhagen Programme.

KATOWICE (Poland)

Polkie Radio. 734 kc/s (408 m.); 16 kW.

Transmits at intervals from 10.40 a.m.

6.0 p.m.—Miscellaneous Announcements, Programme Notes, Theatre Review and Amusement Guide.

6.15 p.m.—Musical Interlude.

6.35 p.m.—News Bulletin.

6.55 p.m.—Report of the Association of Polish Youth.

7.0 p.m.—Two Talks.

7.30 p.m.—Light Music.

9.0 p.m.—Talk by Mr. L. Marschak.

9.15 p.m.—Gramophone Records.

9.50 p.m.—Meteorological Report, Programme Announcements in French and News.

10.0 p.m.—Dance Music.

KAUNAS (Lithuania)

Radio Kaunas. 155 kc/s (1,935 m.); 7 kW.

Transmits at intervals from 11.0 a.m.

6.15 p.m.—Musical Selections.

8.10 p.m.—Talk (to be announced).

8.30 p.m.—Wireless Technical Talk.

8.50 p.m.—Trio Concert.

KÖNIGSBERG (Germany)

Ostmarken Rundfunk. 1,085 kc/s (276 m.); 1.7 kW.

Relayed by Danzig, 662 kc/s (453 m.).

Transmits at intervals from 5.30 a.m.

6.5 p.m.—Talk on East European Economic Problems: The Germans of the Volga District and their Industry.

6.25 p.m.—Weather Report.

6.30 p.m.—Programme from Frankfurt.

8.0 p.m.—Programme relayed from Berlin (Witzleben). In an interval, Weather, News and Sports Notes.

11.30 p.m. (approx.).—Close Down.

LAHTI (Finland)

167 kc/s (1,796 m.); 54 kW.

Relayed by Helsingfors, 1,355 kc/s (221 m.).

Transmits at intervals from 10.0 a.m.

6.15 p.m.—Variety Programme.

7.0 p.m.—Dance Music Programme.

7.45 p.m.—News in Finnish and Swedish.

8.15 p.m.—Dance Music from the Fennia Restaurant.

Programmes for Saturday—(Cont.)

9.0 p.m.—Concert and Dance Music from the Café Stadt Wien.
9.20 p.m. (in the interval).—Time, Weather, News and Sports Notes.
11.30 p.m. (approx.).—Close Down.

OSLO (Norway)

Kringkastingsselskapet. 280 kc/s (1,071 m.); 75 kW. Relayed by Fredrikstad, 815 kc/s (368 m.); Hamar, 511 kc/s (587 m.); Notodden, 674 kc/s (445 m.); Porsgrund, 662 kc/s (453 m.); and Rjukan, 674 kc/s (445 m.).
Transmits at intervals from 10.10 a.m.
6.15 p.m.—Weather and News.
6.30 p.m.—Talk: The History of Piracy.
7.0 p.m.—Time Signal.
7.2 p.m.—Concert of Light Music.
8.30 p.m.—News, Announcements, Press Review and Weather.
8.50 p.m.—Topical Talk.
9.5 p.m.—Film Review.
9.35 p.m.—Talk on Economics.
9.50 p.m.—Gramophone Dance Music.
11.0 p.m. (approx.).—Close Down.

PARIS (France)

Eiffel Tower (FL). 207 kc/s (1,445 m.); 15 kW.
7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
5.45 p.m.—Le Journal Parlé.
7.10 p.m.—Meteorological Forecast.
7.20 p.m.—Dramatic Programme. Selections from the Works of Shakespeare. At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)

Poste Parisien. 914 kc/s (329 m.); 1.2 kW.
9.0 a.m.—Transmission of Pictures.
8.45 p.m.—Gramophone Records, Talk and News Bulletin.
9.0 p.m.—Concert. Overture, "Phédre" (Massenet). Selection from the Music to "Caligula" (Fauré). The Sunken Bell (Respighi). Dance of the Nymphs and Satyrs from "Amour et Psyché" (Georges Schumann), M. Casadesus conducting. Pianoforte Solo: Caprice-Valse, Wedding Cake (Saint-Saëns). Rondo (Max

Reger). Spanish Dance, Zambra (Granados).

PARIS (France)

Radio-Paris (CFR). 174 kc/s (1,725 m.); 17 kW.
Transmits at intervals from 6.45 a.m.
12.30 p.m.—Gramophone Concert.
In the intervals at 1.0 p.m.—Exchange Quotations and News, and at 1.30 p.m.—Exchange Quotations.
2.0 p.m.—Exchange; Market Prices.
3.30 p.m.—Exchange Quotations.
3.45 p.m.—Programme for Children.
4.30 p.m.—Dance Music.
4.55 p.m.—News Bulletin.
5.0 p.m.—"Saint François d'Assise"—Oratorio (Pierné) relayed from the Théâtre du Chatelet.
6.30 p.m.—New York Exchange Rates.
6.35 p.m.—Agricultural Report and Racing Results.
7.0 p.m.—Talk: The Rebirth of Provincial Life.
7.10 p.m.—Literary Review: "La Voie Royale" (Malraux).
7.30 p.m.—Advanced English Lesson.
7.45 p.m.—Commercial Prices, Economic and Social Notes and News.
8.0 p.m.—Literary Readings: Poetic Forms—The Ode and the Ballad.
8.30 p.m.—Sports Review.
8.45 p.m.—Concert from the Works of Offenbach with Introductory Talk. In the interval at 9.15 p.m.—Press Review, News and Time Signal.

POZNAŃ (Poland)

896 kc/s (335 m.); 1.9 kW.
Transmits at intervals from 6.0 a.m.
7.0 p.m.—Talk: English Literature.
7.15 p.m.—Talk on Educational Problems.
7.30 p.m.—Programme from Warsaw.
9.0 p.m.—Time, News, Sports and Police Notes.
9.15 p.m.—Dance Music from the Café Polonia.
11.0 p.m. (approx.).—Close Down.

PRAGUE (Czechoslovakia)

Strasnice. 617 kc/s (487 m.); 5.5 kW.
Transmits at intervals from 10.15 a.m.
6.20 p.m.—Concert with Guitar Selections.
7.0 p.m.—Brass Band Concert.
7.30 p.m.—Programme from Brno.

9.0 p.m.—Time, News and Sports Notes.

9.20 p.m.—News, Theatre Notes and Programme Announcements.
9.25 p.m.—Programme from Moravská-Ostrava.

RIGA (Latvia)

Radio Riga. 572 kc/s (525 m.); 13 kW.
Transmits at intervals from 10.0 a.m.
6.3 p.m.—Cabaret Concert.
7.0 p.m.—News Bulletin.
8.0 p.m.—Meteorological Report.
8.30 p.m.—Dance Music Programme.
10.0 p.m. (approx.).—Close Down.

ROME (Italy)

Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 75 kW. Relayed by Naples, 905 kc/s (332 m.); and Prato Smeraldo, 11,804 kc/s (25.4 m.).
Transmits at intervals from 7.15 a.m.
6.30 p.m.—Giornale radio, News, Sports Notes, Announcements, Report of the International Labour Office at Geneva, Press Review and Time Signal.
7.32 p.m.—Dance Music Programme.
8.5 p.m.—Variety Concert, followed by Recitations and Dance Music.
9.55 p.m. (approx.).—Close Down.

SCHENECTADY (U.S.A.)

General Electric Company (WGY). 790 kc/s (379.5 m.); 50 kW. Relayed at intervals by W2XAF on 9,530 kc/s (31.48 m.).
Transmits at intervals from 11.45 a.m.
11.16 p.m.—Dinner Music.
11.44 p.m.—Weather Forecast.
11.45 p.m.—New York Relay.
12 midnight.—Football Scores.
12.10 a.m. (Sunday).—Piano Solos.
12.20 a.m.—Time Signal.
12.30 a.m.—The Repertory Singers.
1.0 a.m.—Programme from New York.
4.0 a.m.—Dance Music Programme.
5.0 a.m. (approx.).—Close Down.

STOCKHOLM (Sweden)

Radiotjänst (SASA). 689 kc/s (436 m.); 75 kW. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 222.5 kc/s (1,348 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).
Transmits at intervals from 6.15 a.m.
6.30 p.m.—Topical Programme.
6.45 p.m. (from Göteborg).—Talk: Polar Exploration.

7.15 p.m.—A Radio Ball.
8.15 p.m.—Weather and News.
8.40 p.m.—Radio Ball (continued).
12 midnight (approx.).—Close Down.

STRASBOURG (France)

Radio-Strasbourg. (PTT) 869 kc/s (346 m.); 15 kW.
Transmits at intervals from 11.0 a.m.
6.0 p.m.—French Language Lesson in German.
6.15 p.m.—Gramophone Records.
7.15 p.m.—News in French and German.
7.30 p.m.—Instrumental Concert.
10.30 p.m.—Dance Music from the Caveau de l'Aubette.
12 midnight (approx.).—Close Down.

STUTTGART (Germany)

Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.7 kW. Relayed by Freiburg, 527 kc/s (570 m.).
Transmits at intervals from 5.15 a.m.
6.0 p.m.—Time Signal.
6.5—9.0 p.m.—Programme from Frankfurt.
9.0 p.m.—Programme Announcements and News Bulletin.
9.30 p.m.—See Berlin (Witzleben).
12.30 a.m. (Sunday).—Foreign Language Talk: The German Clock Industry.
1.0 a.m. (Sunday).—Close Down.

TOULOUSE (France)

Radiophonie du Midi. 779 kc/s (385 m.); 8 kW.
Transmits at intervals from 1.0 p.m.
6.15 p.m.—Exchange Quotations.
6.20 p.m.—Dance Music Programme.
6.45 p.m.—Orchestral Selections.
7.30 p.m.—News Bulletin.
7.45 p.m.—Recital of Songs and Chansonnettes.
8.30 p.m.—Accordion Recital.
8.55 p.m.—Fashion Review.
9.0 p.m.—Time Signal.
9.2 p.m.—Concert. Introduction and Barcarolle from "The Tales of Hoffmann" (Offenbach). Overture, "The Marriage of Figaro" (Mozart). Cavatina and Aria from "Faust" (Gounod). Two Arias from "Hérodiade" (Massenet). Overture, "Si j'étais Roi" (Adam). Four Selections from "Romeo and Juliet" (Gounod). Three Selections from "The Barber of Seville" (Rossini). Aria from "Othello" (Verdi). Five Selections from "Manon" (Massenet).

10.30 p.m.—North African News.
10.45 p.m.—Selections by an Argentine Orchestra.
11.15 p.m.—"Cello Recital. La chaise à porteurs (Chaminade). Interlude (Chausson). Prayer, from "La Tosca" (Puccini). Aria from "Madame Butterfly" (Puccini). Simple aveu (Thomé). Sicilienne (Pergolesi). Dolly (Fauré). Spanish Serenade (Glazouloff).
11.45 p.m.—Military Band Music.
12 midnight.—News and Close Down.

VIENNA (Austria)

Radio-Wien. 581 kc/s (516.3 m.); 20 kW. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
Transmits at intervals from 10.5 a.m.
6.0 p.m.—Talk: Flowering Orchids.
6.30 p.m.—Time, Sports Notes and Programme Announcements.
6.40 p.m.—Recital of Songs. Eight Songs (Brahms): (a) Auf dem Kirchhof, (b) Mit vierzig Jahren, (c) Sonntags, (d) Ruhe süß, (e) Der Mond steht über dem Berge, (f) Feindsamkeit, (g) Wie bist du, meine Königin, (h) Mein Mädel hat einen Rosenmund. Six Songs (Loewe): (a) Kleiner Haushalt, (b) In der Marienkirche, (c) Die Lauer, (d) Prinz Eugen, (e) Hochzeitslied, (f) Odins Meeresritt.
7.30 p.m.—"Ein Herbstmädel" — Operetta in Three Acts (Kálmán). News after the Programme.

WARSAW (Poland)

Polskie Radio. 212 kc/s (1,411 m.); 1.4 kW.
Transmits at intervals from 10.40 a.m.
6.25 p.m.—Gramophone Records.
6.35 p.m.—Radio Journal.
6.55 p.m.—Gramophone Records.
7.0 p.m.—Talk by Mr. Grabovsky.
7.15 p.m.—Talk: Polish Art during the Past Ten Years.
7.30 p.m.—Vocal and Orchestral Concert. In the interval, Programme Announcements and Theatre Review.
9.0 p.m.—Talk: How to write a Detective Novel.
9.15 p.m.—Gramophone Records.
9.50 p.m.—Weather, Police and Sports Notes.
10.0 p.m.—Dance Music Programme.
11.0 p.m. (approx.).—Close Down.

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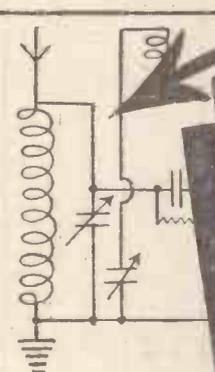
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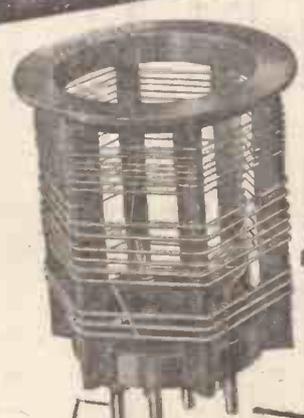


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Stations in Order of Frequencies and Wavelengths

Corrected in accordance with the latest official information available at the time of going to press

The power figures in black type represent revisions received so far under the new power-rating scheme.

Kc/s	M.	Station	Dial Readings	Kc/s	M.	Station	Dial Readings	Kc/s	M.	Station	Dial Readings
EUROPEAN											
(Including Stations connected with the European System.)											
153	1961	Ankara (Turkey), 7 kW.		761	394	Bucharest (Romania), 16 kW.		1211	247.7	Kalmar (relays Stockholm), 0.25 kW.	
155	1935	Kaunas (Lithuania), 7 kW.		770	390	Frankfurt (Germany), 1.7 kW.		1218.3	246.2	Schaerbeek (Brussels) (Belgium)	
160	1875	Huizen (Holland), 8.5 kW.		779	385	Toulouse (Radio) (France), 8 kW.				Turku (Abo) (Finland) (relays Helsinki), 0.6 kW.	
167	1796	Lahti (Finland) (relays Helsinki), 54 kW.		783	381	{ Lwów (Poland), 2.2 kW. (Experimental). Genoa (I GE) (Italy), 1.5 kW. }				Säffle (Sweden) (relays Stockholm), 0.4 kW.	
174	1725	Radio Paris (CFR), 17 kW.		797	376.4	Manchester (2ZY) (Gt. Britain), 1.2 kW.				Eskilstuna (Sweden) (relays Stockholm), 0.25 kW.	
183.5	1635	Königs Wusterhausen (Zeese) (Germany), 35 kW. Relays Berlin.		806	372	Hamburg (Germany), 1.7 kW.		1220	246	Pietersaari (Jacobstad) (Finland) (relays Helsinki), 0.25 kW.	
193	1554	Daventry National Station (Gt. Britain), 35 kW.		810	370.4	Radio LL (France).				Linz (Austria) (relays Vienna), 0.6 kW.	
202.5	1481	Moscow (Old Komintern) (RAI) (Russia), 40 kW.		815	368	{ Fredriksstad (Norway), 0.8 kW. (relays Oslo). Seville (Union Radio) (EAJ1) (Spain), 1.5 kW. }				Cassell (Germany) (relays Frankfurt), 0.3 kW.	
207.5	1445.7	Eiffel Tower (FL), 15 kW.		824	364	Bergen (Norway), 1 kW.		1229	244	Kiruna (Sweden) (relays Boden), 0.25 kW.	
212.5	1411	Warsaw (Poland), 14 kW.		825.3	363.4	Algiers (N. Africa), 13 kW.				Cartagena (Spain), 0.4 kW.	
222.2	1350	Kasbah (Tunis), 0.5 kW.		833	360	Stuttgart (Germany), 1.7 kW.		1238	242	Cracow (Poland), 1.2 kW.	
222.5	1348	Motala (Sweden) (relays Stockholm), 40 kW.		842	356.3	London Regional Stn., 45 kW.		1250	240	Belfast (2BE) (Ireland), 1.2 kW.	
230.6	1304	Moscow (Trades Unions) (Kharkov (Russia), RV 4, 25) 75 kW.		851	352	Graz (Austria) (usually relays Vienna), 9.5 kW.				Radio-Beziere (France), 0.6 kW.	
250	1200	Istanbul (Turkey), 5 kW. Boden (Sweden), 0.75 kW.		855.5	351	Leningrad (Russia), 1.2 kW.		1256	239	Nimes (France), 1 kW.	
260	1153	Kalundborg (Denmark) (relays Copenhagen), 10 kW.		860	349	Barcelona (Radio Barcelona) (EAJZ) (Spain), 8 kW.				Nürnberg (Germany) (relays Munich), 2.3 kW.	
268.6	1116	Novosibirsk (Russia) (R.A.), 40 kW.		869	346	Strasbourg-Brumath (France), 15 kW. Testing.		1265	237	Örebro (relays Stockholm) (Sweden), 0.25 kW.	
272	1103	Moscow, Popoff (Russia), 40 kW.		878	342	Brno (Czechoslovakia), 3 kW.		1283	234	Łódź (Poland), 2.2 kW. Experimental.	
279.6	1073	Rostov-Don (Russia), 4 kW.		887	338.2	Brussels No. 2 (Belgium), 12 kW. (Flemish programme).		1292	232.2	Kiel (Germany) (relays Hamburg), 0.3 kW.	
280	1071	Oslo (Norway), 75 kW.		896	335	Cadix (Spain), 0.5 kW.				Umeå (Sweden), 0.2 kW.	
300	1000	Leningrad (Russia), 20 kW.		905	332	Poznań (Poland), 1.9 kW.		1301	231	Malmö (Sweden) (relays Stockholm), 0.75 kW.	
320	937.5	Kharkov (Russia), RV 20.		914	328.2	Naples (INA) (Italy), 1.7 kW.				Hälsingborg (Sweden), 0.25 kW.	
344.8	870	Tiflis (Russia), 4 kW.		923	325	Grenoble (PTT) (France), 1.2 kW.				Cologne (Germany), 1.7 kW.	
357	840	Nijni Novgorod (Russia), 1.8 kW.		932	322	Paris - Poste Parisien (France), 1.2 kW.		1319	227	Aachen (Germany), 0.3 kW.	
375	800	Kiev (Russia), 20 kW.		932	322	Breslau (Germany), 1.7 kW.				Münster (Germany), 0.6 kW.	
385	778	Petrozavodsk (Russia), 2 kW.		941	319	Göteborg (Sweden) (relays Stockholm), 15 kW.		1337	224.4	Cork (6CK) (Ireland), 1.5 kW.	
389	770	Ostersund (Sweden), 0.75 kW. (relays Sundsvall).		950	316	Dresden (Germany) (relays Leipzig), 0.3 kW.		1346	222.9	Fécamp (France). Mon. Wed. and Fri., 8.30-10 p.m.	
395	760	Geneva (Switzerland), 1.5 kW.		955.4	314	Basle (Switzerland), 0.25 kW.		1355	221	Helsinki (Finland), 15 kW.	
416.6	720	Moscow (Experimental) 20 kW.		959	312.8	Bremen (Germany) (relays Hamburg), 0.3 kW.				Karlstadt (Sweden), 0.25 kW.	
428	700	Minsk (Russia), 4 kW.		968	309.9	Marseilles (PTT) (France), 1.5 kW.		1373	218	Flensburg (Germany) (relays Hamburg), 0.6 kW.	
442	680	Lausanne (Switzerland), HB 2, 0.6 kW.		977	307	Oviedo (Spain), 0.7 kW.				Ornskoldsvik (Sweden), 0.25 kW.	
511	587	Hamar (Norway) (relays Oslo), 0.7 kW.		986	304	Wilno (Poland), 0.5 kW.				Björneborg (Finland), 0.8 kW. (relays Helsinki).	
522	574.7	Ljubljana (Yugoslavia), 2.8 kW.		995	301	Cardiff (5WA) (Gt. Britain), 1.2 kW.		1391	216	Halmstad (Sweden), 0.25 kW.	
527	570	Freiburg - im - Breisgau (Germany) (relays Stuttgart), 0.3 kW.		1004	298.8	Zagreb (Yugoslavia), 0.7 kW.		1400	214.2	Radio Chatelineau (Belgium).	
530	566	Hanover (Germany), 0.3 kW. (relays Hamburg).		1022	293	Bordeaux-Lafayette (PTT) (France), 35 kW.		1470	204	Warsaw, No. 2 (Poland), 1.9 kW. Experimental.	
531	565	Smolensk (Russia), 2 kW.		1031	291	Aberdeen (2BD) (Gt. Britain), 1.2 kW.		1480	203	Gävle (Sweden), (relays Stockholm), 0.2 kW.	
536	560	Augsburg (Germany) (relays Munich), 0.3 kW.				Falun (Sweden), 0.65 kW.		1490	202	Kristinehamn (Sweden), 0.25 kW.	
545	550	Budapest (Hungary), 23 kW.				Hilversum (Holland), 8.5 kW.		1500	200	Jönköping (Sweden), 0.25 kW. (relays Stockholm).	
554	542	Sundsvall (Sweden), 15 kW.				Kosice (Czechoslovakia), 2.5 kW.		1530	196	Leeds (2LS) (Gt. Britain), 0.16 kW.	
563	533	Munich (Germany), 1.7 kW.				Limoges (PTT) (France), 0.08 kW.		1714	175	Karlskrona (relays Stockholm) (Sweden), 0.25 kW.	
572	525	Riga (Latvia), 13 kW.				Viipuri (Viiborg) (Finland), relays Helsinki, 15 kW.				St. Quentin (France).	
581	517	Vienna (Rosenhügel) (Austria), 20 kW.		British Relay Stations							
585	511	Archangel (Russia), 1.2 kW.				Bournemouth (6BM), 1.2 kW.					
590	509	Brussels No. 1 (Belgium), 1.2 kW.				Bradford (2LS), 0.16 kW.					
599	501	Milan (Italy), 8.5 kW.				Dundee (2DE), 0.16 kW.					
603.5	497	Moscow (Russia), 1.2 kW.				Edinburgh (2EH), 0.4 kW.					
617	487	Prague (Czechoslovakia), 5.5 kW.				Hull (6KH), 0.16 kW.					
626	479	Midland Regional Station (Gt. Britain), 38 kW.				Liverpool (6LV), 0.16 kW.					
630	476	Simferopol (Russia), 1.2 kW.				Newcastle (5NO), 1.2 kW.					
635	473	Langenberg (Germany), 17 kW.				Plymouth (5PY), 0.16 kW.					
644	466	Lyons (La Doua), France (relays Ecole Supérieure), 2.3 kW.				Sheffield (6FL), 0.16 kW.					
653	459	San Sebastian (EAJ8) (Spain), 0.3 kW.				Stoke-on-Trent (6ST), 0.16 kW.					
		Zürich (Switzerland), 0.75 kW.				Swansea (5SX), 0.16 kW.					
		Porsgrund (Norway) (relays Oslo), 1.5 kW.		1044.6	287.2	Lyons (Radio) (France), 0.5 kW.					
		Aalesund (Norway), 0.3 kW.		1040	286	Montpellier (France), 1.2 kW.					
		Salamanca (Spain), EAJ 22, 1 kW.				Berlin Relay (Germany), 0.6 kW.					
		Bolzano (Italy) (BZ), 0.2 kW.				Magdeburg (Germany), 0.6 kW.					
		Danzig, (Free City), 0.25 kW. (relays Königsberg).				Stettin (Germany) (relays Berlin), 0.6 kW.					
662	453.2	Klagenfurt (Austria), 0.6 kW. (relays Vienna).				Innsbruck (Austria) (relays Vienna), 0.6 kW.					
		Tromsø (Norway), 0.1 kW.				Uddevalla (Sweden), 0.1 kW. (relays Göteborg).					
		Uppsala (Sweden), 0.2 kW. (relays Stockholm).				Varberg (Sweden), 0.3 kW.					
		Tampere (Tammerfors) (Finland) (relays Helsinki), 1 kW.		1067	281	Copenhagen (Denmark), 1 kW.					
		Nidaros (Trondhjem) (Norway), 1.2 kW.		1071	280	Radio Liège (Belgium).					
666.5	450	Moscow (Russia), RA 2, 1 kW.		1076	279	Bratislava (Czechoslovakia), 14 kW.					
671	447	Paris (PTT) (Ecole Supérieure) (France), 1 kW.		1085	276	Königsberg (Germany), 1.7 kW.					
		Notodden (Norway), 0.1 kW.		1098	273.2	Turin (Italy), 8.5 kW.					
		Rjukan (relays Oslo) (Norway), 0.15 kW.		1103	272	Rennes (France), 1.2 kW.					
680	441	Rome (IRO) (Italy), 75 kW.				Trollhätten, 0.3 kW. (relays Göteborg).					
689	436	Stockholm (Sweden) 75 kW.				Hudiksvall, 0.2 kW. (relays Sundsvall).					
		Malmberget (relays Boden) (Sweden), 0.25 kW.		1112	270	Norrköping (Sweden), 0.25 kW. (relays Stockholm).					
694	432.3	Belgrade (Yugoslavia), 3 kW.				Kaiserslautern (Germany) (relays Munich), 0.3 kW.					
707	424	Madrid (Union Radio) (EAJ7) (Spain), 2 kW.		1121	268	Barcelona (EAJ13), Radio Catalana (Spain), 30 kW.					
716	418	Berlin (Witzleben) (Germany), 1.7 kW.		1130	265.4	Lille (PTT) (France), 1 kW.					
		Rabat (Morocco), 2.5 kW.		1139	263	Moravská-Ostrava (Czechoslovakia), 11 kW.					
721.5	416	Dublin (2RN) (Ireland), 1.5 kW.		1148	261.3	London National Stn., 68 kW.					
734	408	Katowice (Poland), 16 kW.		1157	259	Gleitwitz (Germany), (relays Breslau), 5.6 kW.					
739	406	Kharkov (Russia), 4 kW.		1166	257	Hörby (Sweden), (relays Stockholm), 15 kW.					
743	403	Berne (Switzerland), 1.1 kW.		1175	255	Toulouse (PTT) (France), 1 kW.					
748	401	Tallinn (Estonia), 0.7 kW.		1184	253	Leipzig (Germany), 2.3 kW.					
752	398.9	Glasgow (5SC) (Gt. Britain), 1.2 kW.		1193	251	Almeria (Spain) (EAJ18), 1 kW.					
				1205	249	Juan-les-Pins (Nice) (France).					

DEVIATIONS

The following are the actual deviations from the official frequencies, as noted during measurements made at the Tatsfield Checking Station. All differences of 1.0 kc/s and over are shown.

696.9	430.4	Belgrade (Yugoslavia)
821.8	365	Fredriksstad (Norway)
1013.2	296	Turin (Italy)
1920	294	Kosice (Czechoslovakia)

EXTRA-EUROPEAN STATIONS

U.S.A.

662.1	454	New York (WEAF), 25 kW.
700	428.5	Cincinnati, O. (WLW), 25 kW.
720	416.6	Chicago, Ill. (WGN), 25 kW.
760	395	Bound Brook, N.J. (WJZ), 25 kW.
770	389	Chicago, Ill. (WBBM), 25 kW.
790	380	Schenectady (WGY), 50 kW.
800	375	Fort Worth, Tex. (WBAP), 25 kW.
900	306	Pittsburg, Pa. (KDKA), 25 kW.
990	303	Springfield, Mass. (WBZ), 15 kW.
1090	275.2	St. Louis (KMOX), 25 kW.
1100	272.6	Atlantic City, N.J. (WPG), 5 kW.

CANADA

690	435	Calgary (CFCN), 1.8 kW.
690	435	Toronto (CKGW), 5 kW.
730	411	Montreal (CNRM), 1.6 kW.

AUSTRALIA

665	451	Sydney (2FC), 5 kW.
690	435	Perth (6WF), 5 kW.
734	409	Adelaide (5CL), 5 kW.
779	385	Brisbane (4QG), 5 kW.
808	371	Melbourne (3LO), 5 kW.
838	358	Sydney (2BL), 5 kW.

NEW ZEALAND

714	420	Wellington (2YA), 5 kW.
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For List of Short-Wave Stations see page 725.

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*—by eliminating
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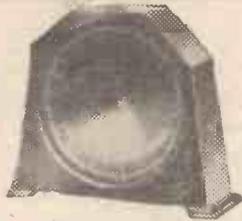
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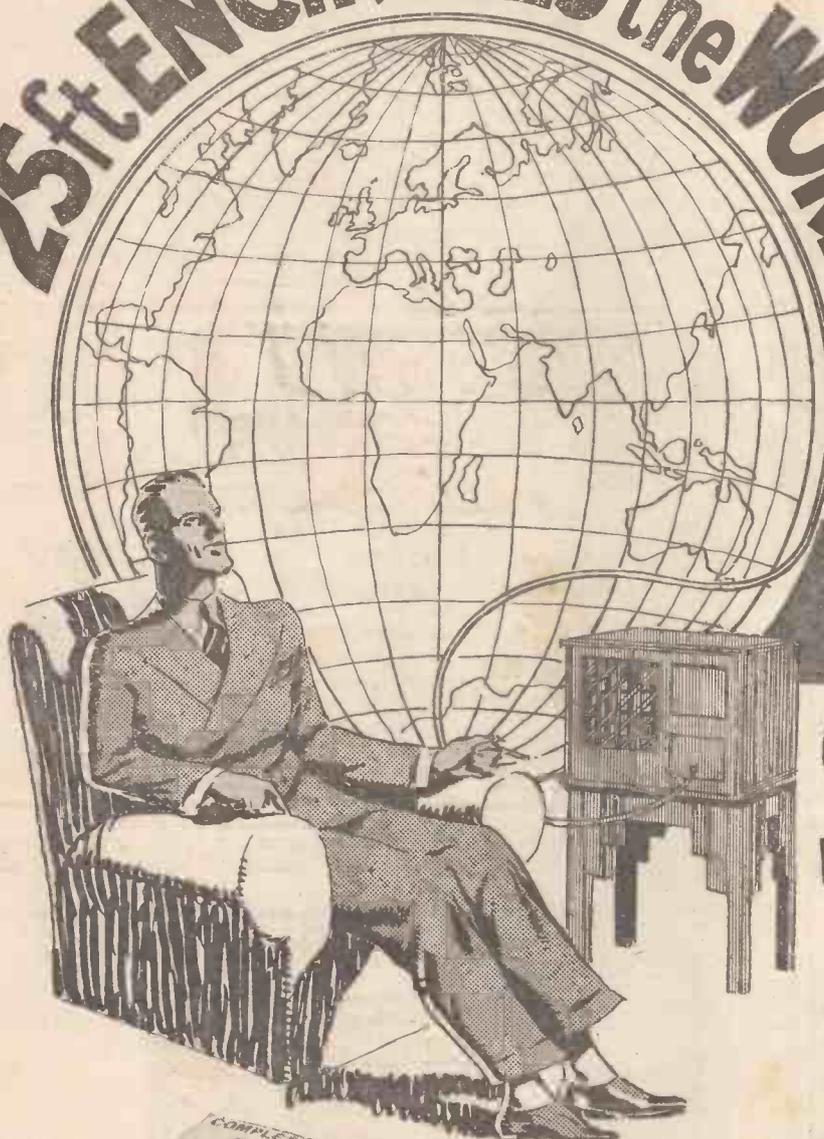
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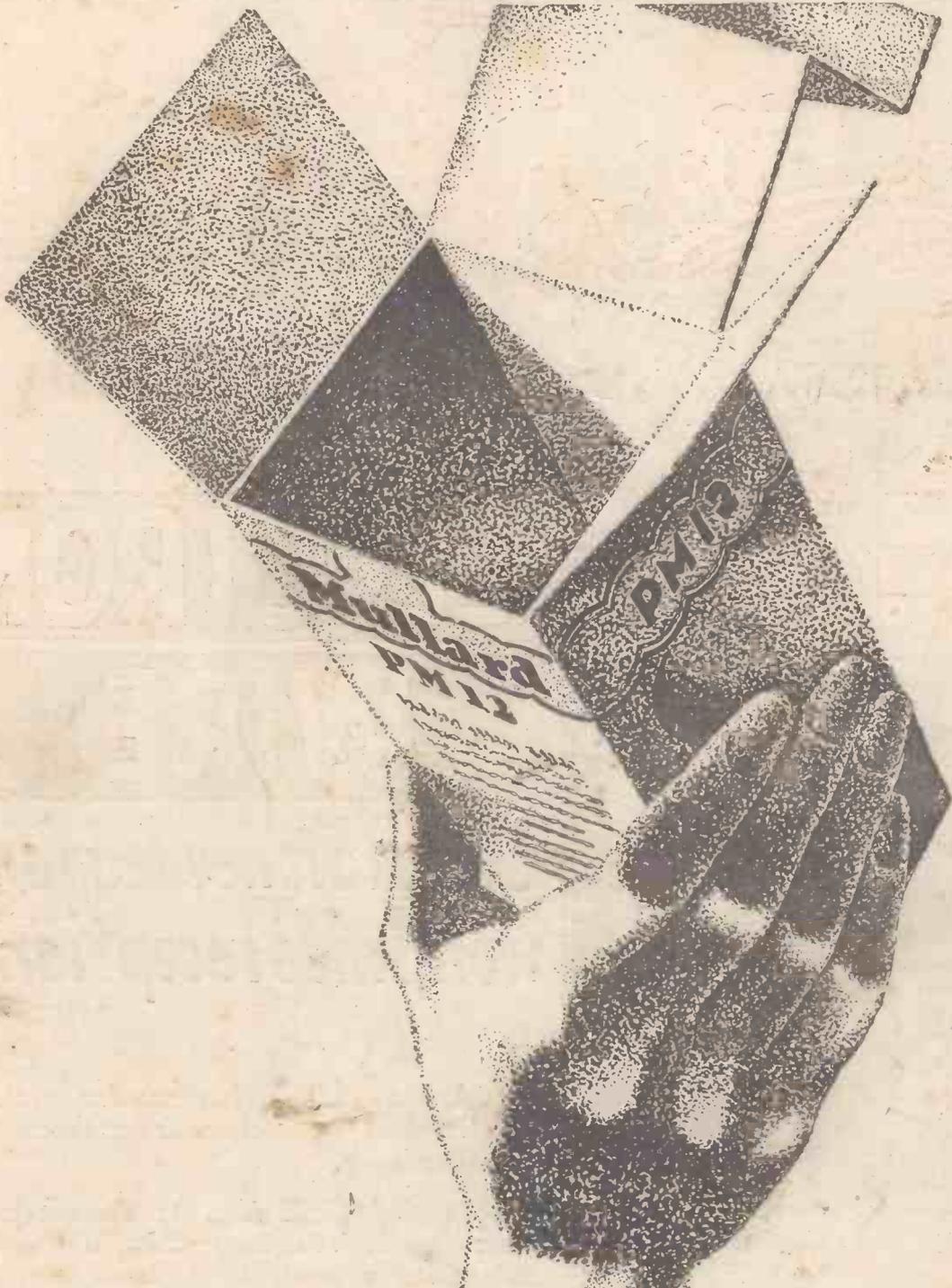
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