

A SHORT-WAVE 2: THE "MERRY-MAKER" PORTABLE

Amateur Wireless

and
Radiovision

Every
Thursday 3^d

Vol. XVI. No. 412

Saturday, May-3, 1930

The "MERRYMAKER"
PORTABLE

FULL DETAILS IN THIS ISSUE

A
Short-
Wave '2'



LONDON-
WITH
A PUSH

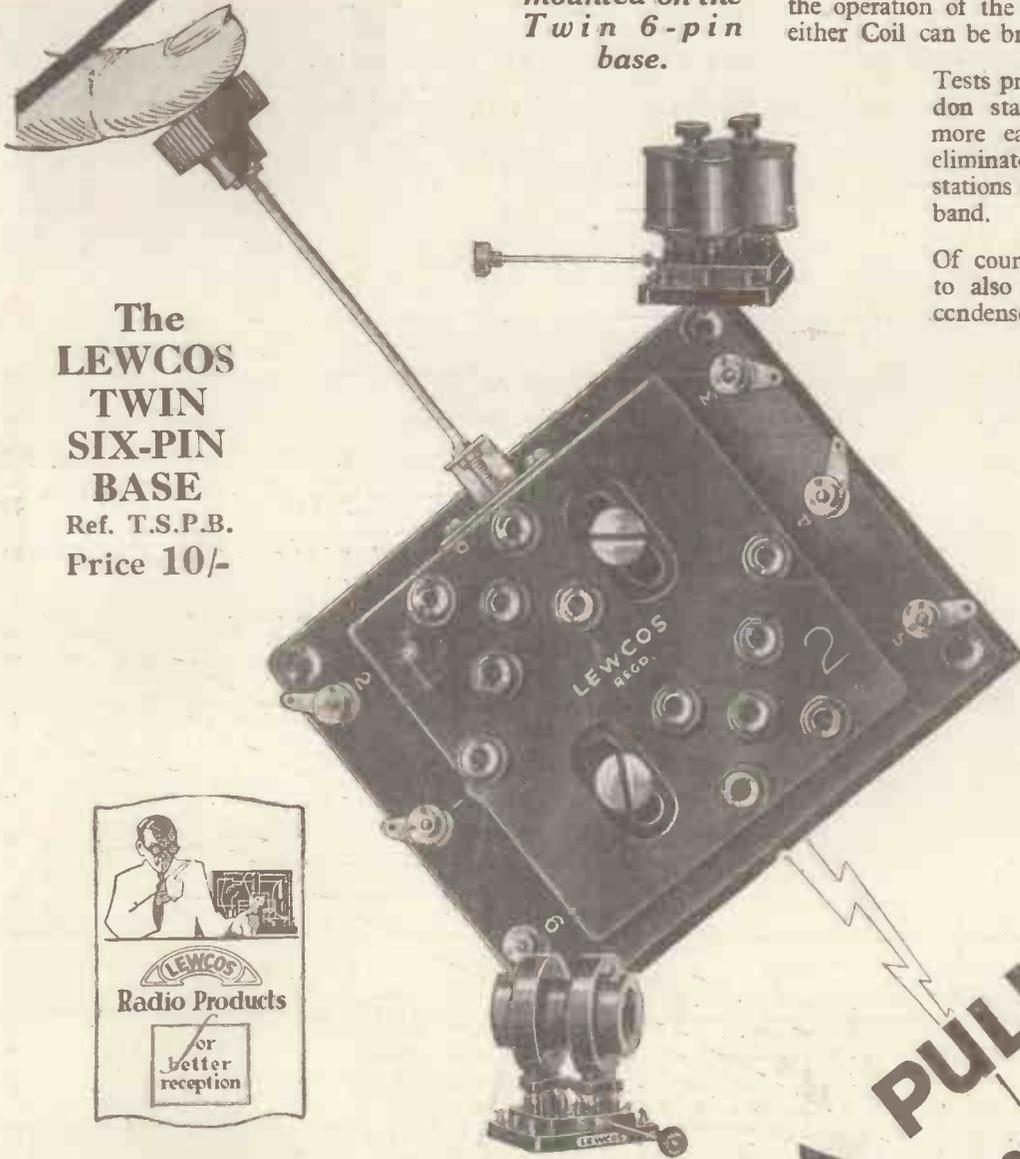
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Slaithwaite News—A New One for the S.W. Man—A Peep Inside—Lingo!— Empire Broadcasts—When the Monkeys Broadcast

Slaithwaite News—There will be 500-ft. masts at the new Moorside Edge station, and they will make the Brookmans Park masts look small in comparison! The Radio Communication Co. has already started work on the masts, which will be insulated at the base. The wavelengths for Moorside have been fixed at 479.2 metres and 301.5 metres, that is, those at present used by 5GB and Aberdeen.

A New One for the S.W. Man—Have you heard Italy's new giant short-wave station on 25 and 80 metres? This new "meat" for the short-wave DX hound is situated just outside Rome, and in a very fine building is housed some short-wave gear which was specially brought from England, and was tested at Chelmsford: that is, by a strange coincidence, within a stone's throw of 5SW, which is now working on about the same wavelength, namely, 25.53 metres. The short-wave Rome should be easily heard by our amateurs, for it is putting out a power of about 12 kilowatts!

A Peep Inside—The two photographs below show, respectively, the control room and the transmitter house. Just outside the building you will see the special lead-in arrangements. A Franklin aerial is employed. Strangely enough, this short-waver

is not crystal controlled, but has a special gadget of the master-oscillator type. The programmes for this short-waver come from studios in Rome, but don't confuse this station with the broadcast-band Rome on 441 metres.

Empire Broadcasts—And, talking of short-wave stations, have you heard that news is now being given via 5SW? Chelmsford radiates on weekdays, for a period of one month only, a special Empire news bulletin. The time of this bulletin is 5.55 to 6.15 p.m., British Summer Time (16.55 to 17.15 G.M.T.) and it is preceded by a tuning note of five minutes' duration. The object of this (for which thanks are due to Reuters) is to obtain evidence as to the utility of radio news bulletins to the Colonies, before the delegates to the forthcoming Colonial Conference leave their respective countries for London in June.

Lingo!—"Jay Coote" (writing in

PRINCIPAL CONTENTS

	Page
Current Topics	605
Continental Nights	606
The "Wavelets 2"	607
Is the B.B.C. Microphone "Cold"?	609
Around the Short-wave Dial ...	610
On Your Wavelength	611
For Listening off the Beaten Track	613
Correct Tracking	614
Without Fear or Favour	616
A Remarkable Selectivity System ...	617
The "Merry-maker" Portable ...	618
"A.W." Tests of Apparatus	622
My Wireless Den	624
Radiograms	626

"A.W." No. 410) must have seen my log!" says a Birmingham reader. "That's just how I log some of my stations—sounded French, but might be German." I can tell my foreign stations only by their wavelengths—and not always then, thanks to the Prague Plan. I enjoy the international language of music, but I'm stumped when the foreigners start their announcements. Why can't *all* stations announce in English, French and German?" It would be very nice for us, and for the French and Germans, but what about Russia, Denmark, Holland, Italy, Spain—and so on, throughout the long list?

When the Monkeys Broadcast—The next broadcast from the Zoo is to be on May 13. Already the B.B.C. engineers have been conducting microphone "auditions" with the Zoo's inmates, from the laughing jackasses to the gibbon apes, and some newcomers will be heard.

Next Week—If you have mains, watch for next week's set—an A.C. "Two." Easy to build.



Two peeps at the new short-waver at Rome. (Left) the control room, and (above) the transmitter house. Note the aerial feeder arrangements.





Continental Nights

The land of the DYKES

By J. GODCHAUX ABRAHAMS

IF a census were taken over the last four years, I believe that the foreign station most generally heard would prove to be that of Hilversum. It is one of those transmissions which can be captured at most hours of the day or evening and which, for its reception, does not call for an expensive receiver, notwithstanding the fact that its broadcasts are put out with only 6.5 kilowatts in the aerial. Holland is a small country, and for this reason was granted a very limited number of wavelengths by the Geneva Bureau, and consequently she has been compelled to juggle with them. Every three months a change-over takes place, and both Huizen and Hilversum, although in possession of immobile studios, are blessed—or cursed!—with mobile wavelengths, inasmuch as they are compelled to exchange transmitters.

The Hilversum-Huizen Change-over

However, from April 6, Hilversum went back to work on 1,071 metres and Huizen now operates on 1,875 metres.

Of the two stations, I find the programmes from the former station more interesting, possibly for the reason that the studio remains longer in possession of one authority than is the case with the competitive Dutch transmitter; perhaps, also, because the A.V.R.O. is blessed with such a cheerful announcer and for the reason that this Association has done most to further the cause of broadcasting in Holland.

On almost any night you may be sure of a good entertainment from the moment the A.V.R.O. and the V.A.R.A. come on the air.

Bear in mind that Holland is also blessed with so many different political parties and religious sects, that up to the present it has been found impossible to effect an amalgamation and thus constitute a strictly neutral broadcasting authority.

Take, for instance, Hilversum; we find here as the main supplier the *Algemeene Vereeniging Radio Omroep* (A.V.R.O.), assisted by the *Vereeniging Algemeene Radio Arbeiders* (a workers' association) (V.A.R.A.), and at times, but less frequently, the *Vryzinnige Protestantische Radio Omroep* (V.P.R.O.), responsible for many Protestant church services and sacred concerts. The Huizen station, on the other

hand, is at the disposal of four similar groups, namely the Netherlands Christian Broadcasting Company (*Nederlandsche Christelijke Radio Vereeniging*) (N.C.R.V.), the *Katholieke Radio Omroep* (K.R.O.), and on some days, for the teaching of languages, the *Nederlandsche Draadloze Omroep* (N.D.O.).

You will see that it is due to the number of programme organisers that we get such variety of entertainment.

Tune-in to 1,071 metres on any evening at about 7.40 p.m., B.S.T. You may consider the hour an odd one, but Amsterdam time is twenty minutes in advance of B.S.T. There are many chances that you will pick up an excellent broadcast of gramophone records. Hilversum does not lack in enterprise, for on the menu we may

only made in the Dutch language, but we register two exceptions, for, in view of the interest taken by British listeners in the broadcast of newly-published gramophone records, the A.V.R.O. announces the titles in English as well as in Dutch. Also, on alternate Sundays, through the V.A.R.A., a British firm offers a concert to radio amateurs in the United Kingdom, and on these occasions a bi-lingual Dutchman gives us all the information we may need.

From this station we can also draw a liberal dose of dance music, mostly relayed from Amsterdam cabarets, dance halls, or cinema palaces.

When closing down on gala nights you may hear the Dutch National Anthem (*Wilhelmus van Nassau*), but for most occasions the A.V.R.O. has adopted a gramphonic "good night" record, at the end of which, as a final good-bye, the announcer will cheerily call, "*Goeden avond, Dames en Heeren*," with the further wish that his listeners may sleep well ("*wel te rusten*").

The Huizen Programmes

Now come with me to Huizen (pronounced Hoy-zen), the more recently constructed transmitter, situated in an old fishing village on the southern bank of the Zuider Zee, but a few miles from Hilversum.

The programmes broadcast from Huizen on 1,875 metres on the whole are of a more serious character than those transmitted by their competitors. In the matter of lighter entertainment, Huizen provides large doses of gramophone broadcasts, a daily supply of lunch-hour music, with occasional relays of concerts or performances given at local or neighbouring halls. On occasion, also, the studio may take us over to a theatre in Amsterdam or to some place of amusement at Utrecht. Time signals are transmitted almost hourly throughout the day, and consist of Westminster chimes furnished by the studio clock; apart from these, during intervals in the programmes, a musical carillon, consisting of six notes repeated *ad lib* (G D E B D B, in C major) will help you to identify the station. All announcements are made in Dutch and, to all appearances, the organisers cater only for their native land.

WIRELESS WIT

We hear that Frank Webster's diction as a wireless singer is admirable. With a Webster we naturally do not expect to need a dictionary.

In Kenya no one may sell a wireless set to any person not holding a licence. "Kenya show yer licence!" is, we understand, the slogan.

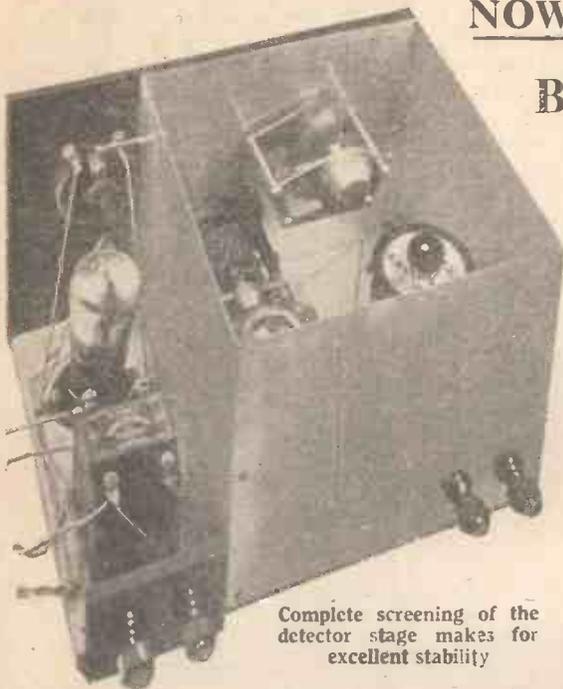
"Why do so many artistes act as publicity agents to Bumble?" asks Mr. Moseley. It is bound to be so.

notice a Cossack choir, an orchestra, an operatic performance with first-class singers and full chorus, or a relay from a theatre. During the winter many visits are made to the famous Amsterdam *Concertgebouw*, for a series of orchestral and vocal concerts for which international artistes are engaged; during the summer we are taken to the Scheveningen Kursaal. These musical entertainments compare favourably with any which may be given to us from London or from any other of the main European capitals.

Apart from its clock and chimes, the private property of the A.V.R.O., this station possesses no other distinctive signal, but on V.A.R.A. nights the dulcet tones of a musical box (nine chords repeated every five seconds) will reach your ears. Generally speaking, announcements are

NOW IS THE TIME FOR SHORT-WAVE WORK

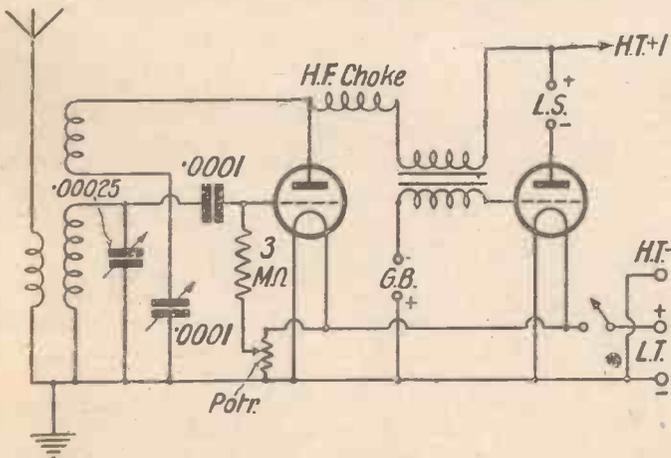
**BUILD THE
"WAVELETS 2"**



Complete screening of the detector stage makes for excellent stability

THE great point about this new short-wave set, appropriately termed the "Wavelets 2," is that it is very easy to build and childishly simple to operate. This set is very well shielded, so that it is quite stable in working; and whereas most shielded short-wave sets, having much metal in their construction, necessitate work on the metal part which is really outside the capability of the average amateur, the "Wavelets 2" can be put together in an evening with the ordinary tools used in set construction.

The circuit is quite straightforward, comprising only a detector and one L.F. stage.



The circuit includes a grid-leak potentiometer giving smooth reaction

Not only does this mean that there are no very expensive parts to buy, as might be the case were an H.F. stage used, but there is only one tuning control. This advantage will best be appreciated by those who have long struggled with out-of-date sets.

The following list shows the parts which are required for construction. In each case is given the actual component used and suitable alternatives.

Components Required

- Ebonite panel, 10 in. by 7 in. (Keystone, Becol).
- .00025 - microfarad variable condenser, with slow-motion attachment (Polar, J.B., Lissen, Dubilier, Igranic, Burton).
- .0001-microfarad reaction condenser, with slow-motion attachment (Polar, J.B., Lotus, Burton).
- 400-ohm potentiometer (Lissen, Varley, Wearite, Igranic).
- On-off filament switch (Bulgin, Junit, Lissen, Lotus, Benjamin, Keystone).
- 6-pin base (Lewcos, Tunewell, Formo, Lissen).
- Short-wave high-frequency choke (Trix, Polar, Igranic).
- .0001-microfarad fixed condenser, with series connection (T.C.C., Dubilier, Watmel).
- 3-megohm grid leak (Lissen, Dubilier, Graham-Farish, Watmel).
- Low-frequency transformer (Varley, Nicore II, Lissen, Brownie, Telsen, Igranic, Lotus, Burton).
- Two anti-microphonic valve holders (Benjamin, W.B., Lotus, Formo, Burton, Igranic, Wearite, Trix).
- Aluminium screening box, 7 in. by 7 in. by 6½ in., with lid and foil base (Parex, Ready Radio).

Eelex, Keystone).

- Baseboard, 10 in. by 7 in.
- Five yards flex (Lewcoflex, Keystone).
- Glazite for wiring.
- Set of 6-pin short-wave coils (Lewcos, Tunewell).

Construction

Before commencing construction you should get a copy of the full-size blueprint, which can be obtained, price 1s., post free, from the Blueprint Department of AMATEUR WIRELESS, 58-61 Fetter Lane, London, E.C.4. When any metal work has to be undertaken, constructors are particularly advised to work direct from the blueprint in order to prevent the possibility of short circuits and wrong wiring. The print shows all the components in their exact positions, and it is almost impossible to go wrong if the blueprint is studied in conjunction with the photographs and these descriptive notes.

The essential part of this set is the screening box, and this is, perhaps, best bought ready made. However, any amateurs who are accustomed to metal work can easily make up a simple box such as this in half an hour or so. The box is placed on the wooden baseboard of the set and the ebonite panel is attached to the front in the ordinary way.

It will be noticed that the high-frequency choke is supported away from the metal floor on a small strip of ebonite. The other

- Terminal strip, 2¾ in. by 2 in. (Keystone, Becol).
- Four terminals, marked



The complete arrangement is discernible in this picture

L.S. +, L.S. -, A, E (Belling-Lee, Clix, Eelex, Keystone).

Four plugs, marked G.B. +, G.B. -, H.T. +, H.T. - (Belling-Lee, Clix, Eelex, Keystone).

Two spade tags, marked L.T. +, L.T. - (Belling-Lee, Clix,

components are screwed direct to the metal floor and through to the baseboard; the aerial and reaction condensers also are clamped to the panel, without insulation.

The aerial terminal has its metal shank insulated from the back of the box, of course, and a small fibre or ebonite washer does this effectively. Three wires which pass through the side of the metal box to the low-frequency stage are insulated by three short lengths of Systoflex.

Wiring

If the wiring is carried out with insulated wire, this Systoflex is hardly necessary except, perhaps, as an added protection to prevent the insulation being cut by the holes in the metal. It is generally recognised that bare wire is better in short-wave set construction, and although the practical difference is probably not very noticeable, readers are advised, for the sake of simplicity, to use uncovered wire. In any case, there are so few leads that, provided ordinary care is taken, there will be no possibility of short circuits.

The wiring of the L.F. side of the set should present no difficulty, but take care that you do not get the battery flexes mixed. Wander plugs and accumulator spade tags respectively should be attached

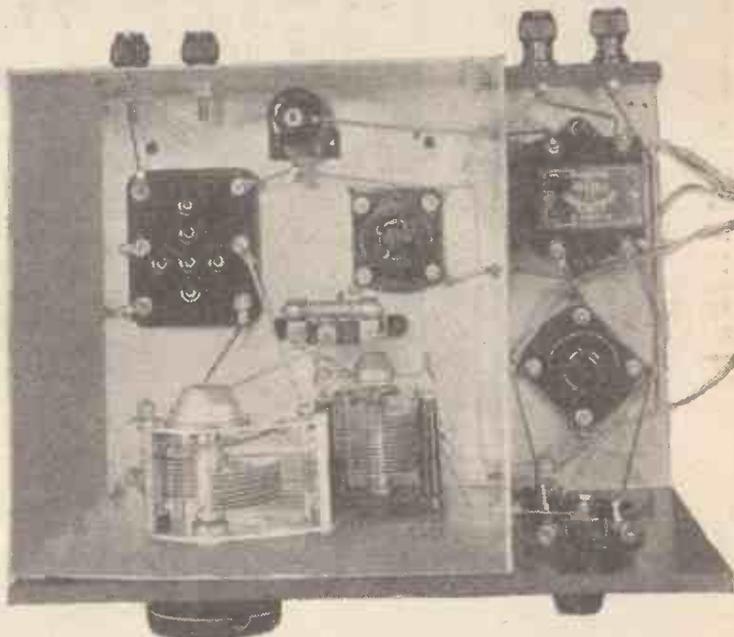
to the ends of the flexes before they are twisted. The two terminals on the ebonite strip are for the loud-speaker or phones.

There is really no need to use super-capacity H.T. batteries with a set of this type, and in most cases readers will use the batteries which are otherwise employed in connection with the broadcast receiver. In some districts it may be possible to get good results with an eliminator, but generally speaking dry or wet batteries or an H.T. accumulator are to be preferred. The H.T. voltage should, in any case, be over 100, and 120 to 150 volts is advisable.

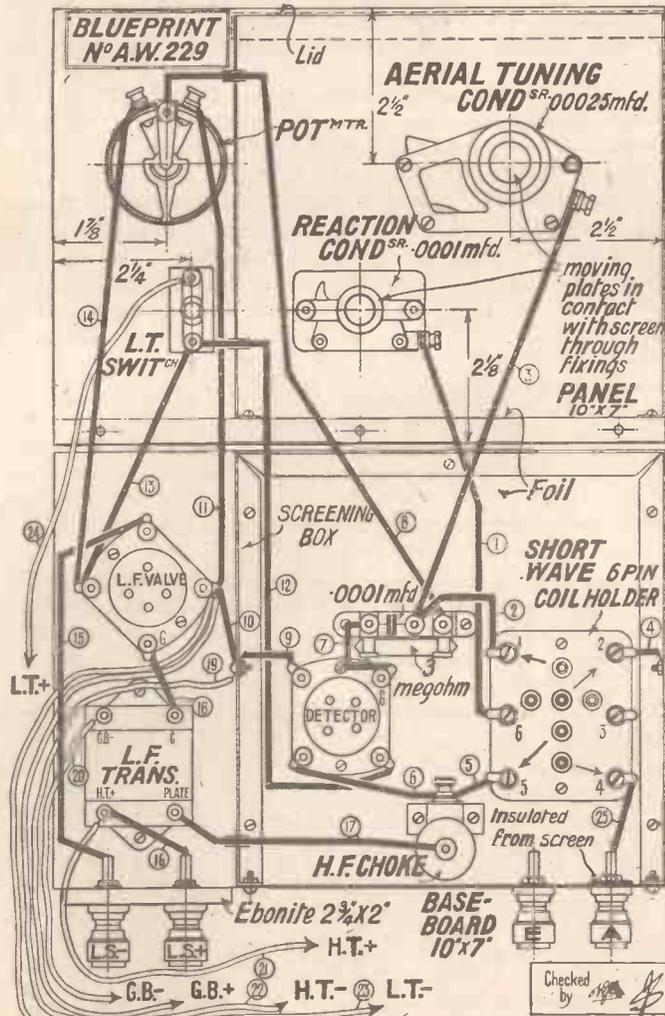
The detector valve should be of the medium

Six-Sixty D610, Osram HL610, Mazda HL607.

For loud-speaker working, however, a small power valve is advisable, and the following list will serve as a guide: Two-volts: Cossor 220P, Dario SP, Marconi P215, Osram P215, Six-Sixty 220P, Mullard



The wiring will be found very simple if the diagram below is studied in conjunction with this plan view



The wiring diagram of the "Wavelets 2" Blueprint, price 1/-

impedance H.F. type and can be chosen from the following: Two-volts: Cossor 210HF, Dario Univ., Marconi HL210, Osram HL210, Six-Sixty 210HF, Mullard PM1HF, Mazda HL210, Lissen HL210. Four-volts: Mullard PM3, Six-Sixty 4075HF, Osram L410, Marconi L410, Dario Univ., Cossor 410HF. Six-volts: Cossor 610HF, Marconi HL610, Osram HL610, Six-Sixty D610, Mullard PM5X, Mazda HL607.

If the set is to be used with phones, then an ordinary L.F. valve is advisable, such as the following: Two-volts: Cossor 210LF, Marconi L210, Osram L210, Six-Sixty 210LF, Mullard PM1LF, Mazda L210, Lissen L210, Dario Univ. Four-volts: Mullard PM3, Six-Sixty 410D, Cossor 410LF, Marconi L410, Osram L410, Dario Univ. Six-volts: Cossor 610LF, Marconi HL610,

PM252, Mazda P220, Lissen P220. Four-volts: Cossor 410P, Dario SP, Marconi P410, Osram P410, Six-Sixty 410P, Mullard PM4. Six-volts: Cossor 610P, Marconi P610, Osram P610, Six-Sixty 610P, Mullard PM6.

The Coils

Ordinary six-pin short-wave coils are used, of the type comprising an aerial winding with magnetic reaction. As there are one or two types of six-pin short-wave coils, it should be explained that this coil is of the type in which the aerial connection is made to pin No. 4 on the six-pin base. As a guide it may be explained that coils such as the Lewcos AMS2 tune from 15 to about 25 metres, the AMS4 from 20 to about 45 metres, and the AMS9 from about 40 to about 90 metres. The AMS25 type coil will be found very useful for "bagging" the higher waveband amateurs between 90 and 250 metres. If you plug in the AMS25 on any Sunday morning you will always find plenty of stations on the ether.

As you get accustomed to the working of the "Wavelets 2," there are two points which you will appreciate; first, the provision of the grid-leak potentiometer, by means of which a very smooth control of reaction can be obtained; second, the vernier adjustment of the reaction condenser, which is a veritable boon when one is searching out.

Don't forget that the "Wavelets 2" is on view all next week in the windows of the radio department of Messrs. Selfridge and Co., Ltd., London.

A PLEA
FOR LESS
FRIGIDITY

—By
KENNETH
ULLYETT

IS THE B.B.C. MICROPHONE "COLD"?

IT is an open secret that Savoy Hill is not the free-and-easy place that it was in its very early days. One hesitates to say that now the B.B.C. is a Corporation it is bound in its actions by the proverbial Governmental red tape, but nevertheless there must be some valid reason why the B.B.C. microphone is nowadays always strictly formal; and this formality is a natural expression of the officiousness approaching to frigidity which is patently obvious to anyone visiting Savoy Hill.

Time was when Cecil Lewis (I think it was) would deal with audition applicants during the morning and early afternoon, help with "Uncle Arthur's" Children's Hour at tea-time, have a hurried snack of meringues and cream (during which, perhaps, a précis of a broadcast opera would be prepared) and then dash off to Covent Garden in time for an outside-broadcast.

The 1923 Days

Or Arthur Burroughs would be told during an evening's broadcast that there was something wrong with the apparatus at the studio end, and between intervals of helping the engineers and making announcements in the studio he would carry on the programme as best he could. On one such occasion, I remember, he gave an impromptu half-an-hour's talk on "Adventures in China" when something unforeseen occurred in the programme arrangements, and there was a time gap to be filled!

Nothing so exciting happens nowadays. The B.B.C. has compressed itself into a rigid scheme, which, if one takes the serious view, is really necessary now that broadcasting is not only a full-time job, but one which occupies the most of every day except, unfortunately, Sundays.

Those Stock Phrases

The days when the "officials" behind the microphone were not red-tape men,

but were just ordinary folk as equally thrilled by the new romance of broadcasting as were listeners, are now gone; one supposes, for ever. Precious little that is impromptu ever comes into the studio, unless it be a speech by a Cabinet Minister, or a B.B.C. humorist! That is just the point: so little is impromptu that one longs for a breakaway from the conventional and polished phrases of announcers, the carefully edited play MSS, the censored talks; indeed from all those things which lead one to anticipate exactly what the loud-speaker will say on any one occasion.

Take the weather report, for instance. Owing to questions of copyright, announcers must read out only exactly what is given on the typewritten sheets supplied by the meteorological authorities. "A deep depression is approaching . . ." "an anticyclone centred over the Atlantic . . ." "further outlook unsettled . . ." How familiar are all those old phrases, and how much more cheerful would be our outlook on the weather if the radio reports could be given not only in the language of the man in the street, but in a varied manner so that old friends such as the depressions and the anticyclones could be given a rest for a while.

Victorianism

The trouble is the same with the news bulletins and with the introductory announcements for artistes. We know that the sporting results, market prices and financial news must form part of the daily routine, but it is nevertheless to be deplored that the giving out of important information must always be effected with a disinterested, dry-as-dust delivery.

One is tempted to ask why the B.B.C. has taken upon itself the cloak of almost Victorian disinterestedness.

Were I to tackle a Savoy Hill official on the subject, he would be sure to say (yes, again, one always knows what an official answer will be!), "Well, my good

fellow, the B.B.C. must be impartial, you know."

That is rather beside the point, for there is a whole big difference between being impartial and being disinterested. This difference is strikingly illustrated by the daily papers, despite the fact that most of them have a political axe to grind. The daily paper outlook on current news is always more lively than that of the man at the microphone.

Topsy-turvy News

Broadcast news bulletins are always topsy-turvy; for one thing, the court circular comes first, and the vividly-interesting national news comes second. Perhaps broadcast news would be better received if there were headlines, for headlines rank equal in importance with actual news in a daily paper, and it would not be difficult to preface each broadcast bulletin with some short, succinct comments.

But no, that isn't possible, for the broadcast news still comes from the same fount as that which supplies the daily papers, and the dailies make very sure that the B.B.C. never gets the plums. I have commiseration for the B.B.C. in this matter, for it would be a good thing if it could copy the *journal parlé* of Radio Paris.

It is in the announcement of artistes, however, that this disinterestedness reaches a climax. While the announcers may be afraid of making or marring an artiste's reputation by giving an announcement a little out of the ordinary, they should realise at the same time that they have it in their power to prevent many people reaching for the L.T. switch before an item commences, just because the preliminary title sounds uninteresting. That is only a reasonable temptation.

The other week there was a talk by an M.P. under the ghastly title of "International Co-operation, and what it Means." Knowing that M.P.'s activities I can safely

(Continued at foot of next page)

Some Notes on Present-

day Short-wave Conditions

Around the Short-wave Dial

By M.
BARNETT

THE recent improvement in short-wave conditions has fallen off rather during the last week or so; but, nevertheless, there are several short-wave stations really worth listening to at the present time. 3RO, the new Rome short-wave station, has been heard testing frequently on about 25 metres. Most of the announcements are given in English and the tests generally consist of records. Although a loud signal, this station is somewhat distorted at times. A British station on about 27 metres, possibly GBX, has been relaying the National programme, and this in turn has been relayed by VK2ME, the Sydney short-wave station. Some very good results would appear to have been obtained by these tests and the Australian station has been coming in at remarkable strength at times.

7LO, at Nairobi, Kenya Colony, has also been coming over at increased strength. The programmes from this station seem to be very English and the writer recently heard a vaudeville act coming over, which included a "thriller" in strong Cockney

tones! This station, unfortunately, like so many others, has one bad failing, and that is that the call-sign is rarely announced. Even when it is given, it is announced in a very casual manner and is usually given in between some other announcements.

Good Americans

The majority of short-wave amateurs usually search the waves below 32 metres for their DX "catches," but there are some good stations above this wavelength worth attention. W8XK, when it is working on its higher wave of 48.86 metres, is frequently stronger on this wave than on its lower wave of 25.25 metres. There are also several other American stations grouped around 29 metres, and good signals can be heard frequently from W2XE, W2XL, W2XCX, and W3XAU. If you are tired of the erratic conditions of the wavelengths below 32 metres, try for these longer wave stations. They are generally very reliable and do not vary so much from night to night, although it is usually

necessary to tune them in later to get them at their best. They usually come in well about 11.30 and improve in strength from then onwards. Unfortunately, these stations very often suffer from interference by Continental amateurs, some of them with very raw A.C. notes.

It appears that the recent improvement in short-wave conditions holds good for reception on the other side of the Atlantic also, for an American friend writes to the effect that such stations as G5SW and PCJ, which have been very poor signals there for the latter part of the winter, are now gaining in power and becoming much more reliable. One can safely assume from this that the short-wave conditions are really improving and we may look forward to a summer of really good short-wave conditions. This is where the owner of a short-wave set comes into his own, for, while the broadcast receiver is almost useless during the summer months for really long-distance reception, the short-wave set is as good, if not better, as it is during the winter months.

"IS THE B.B.C. MICROPHONE 'COLD'?"

(Continued from preceding page)

I guess he did not choose that title. I nearly switched off when I heard the announcer say exactly what was in *Radio Times* by way of introduction, but I'm glad I didn't, for it turned out to be a helpful chat on little social problems.

The title should have been different, and the preliminary speech by the announcer very different. But of course it wasn't the announcer's fault, but that of the force—the "policy," if you will—behind the B.B.C., and which says that announcements must be formal and stereotyped.

I have never been to America. Nor am I fretting because I don't live there: that artificial warmth and friendliness which pervades Transcontinental life, and which certainly has eaten into American radio (as I judge it by occasional short-wave DX listening) would be boring to a Britisher. American small-talk, as one hears it on the talkies, is equally fascinating at first and boring in quantity.

But I do think that a small amount of that personal connection between the announcer and the listener which is very evident in U.S. publicity broadcasts would be a good thing for the B.B.C. regime. Of course, when broadcasting is run by

publicity, as it is in the States, the announcer can't just say, "Miss So-and-so will now sing."

One would say something like, "Folks, you are now to have a real treat. The famous Miss So-and-so (of course you all know her) is going to give you some snappy selections from her repertoire. You'll like 'em. D'you know, the last time Miss

So-and-so broadcast through the chain she had a fan mail of five hundred letters a day. A record, I'll say! Miss So-and-so, meet 'mike' and all the listeners to the Palm Oil Soap Radio Hour, provided by—," etc.

Americanisms!

I've heard that kind of thing so often via most American short-wavers. It can easily be overdone, but we might at least try it in a very much Anglicised form.

I hear that some listeners to the N.B.C. chain in America have been complaining that when a Westminster Abbey service was recently relayed the B.B.C. announcer was so frigid that he didn't even announce the name of the principal speaker. They complained also that when H.M. the King spoke at the Naval Conference there was a good example of the "cold" microphone. A voice described what was to take place, and then, after some minutes' silence, another voice was heard. It was a long time before American listeners realised that this was the King.

Maybe there's something in these complaints. There are many B.B.C. listeners who would like their loud-speakers to speak to them in a more friendly and explicit way, and to drop a little of the frigidty.



Miss Anita Elson in cartoon

On Your Wavelength!

Why Not?

ON Good Friday and Christmas Day, when there are no newspapers, I always wait eagerly for the news bulletin to be brought in by the loud-speaker. Life without newspapers somehow seems rather a blank, and this is particularly the case when, as on Good Friday, you have a mixture of rain, hail, snow, sleet, and perishing cold. And then the announcer informed us that there wasn't any news! Editors do not seem to have had any difficulty about filling Saturday's paper, for there was plenty of news, both home and foreign. This is just one of the examples of how the B.B.C. does at times completely fail to rise to the occasion. Nothing could have had a bigger entertainment value than news on Good Friday evening; nothing could have been more satisfying to the wireless public. This was certainly one of the occasions when no news was *not* good news.

For the Empire

A much more cheering aspect of the news question is to be found in the announcement that for a month 5SW is to send out a special news bulletin on the short waves to the whole world. Hitherto the situation has been a very curious one. No country in the world has such a great Empire as ours, and therefore so many of its sons and daughters living in distant places are thirsting for news from home. Yet we did not give them any. They had to rely for their news of all kinds upon Dutch, American, and other foreign stations. It was rather galling to the pride of the Britisher dwelling far afield to have to tune in the nasal accents of a Yank announcer in order to hear what had won the Grand National. Anyhow, there is to be a news bulletin from Chelmsford for a few weeks, at any rate. Whether it is continued or not will largely depend upon the reports received from overseas, and the matter is to be discussed both at the Colonial Conference fixed for next June and at the Imperial Conference in September.

It Must be Done

Personally, I quite expect that a large number of these reports will not be particularly favourable. The reason is twofold. In the first place, 5SW is going to send out a news bulletin for only twenty minutes between 5.55 and 6.15 p.m. daily. We have to bear in mind that local time in our colonies and dominions differs by from one hour to twelve from that of Greenwich. The time chosen for the news broadcasting, therefore, will undoubtedly not fit in with

many people's waking and sleeping hours. The second point is that 5SW uses only one wavelength of 25.53 metres, which has been shown by experiment to give good reception in comparatively few places except at certain times of the day and night. 5SW's broadcasting hours are exceedingly short, being only from 12.30 to 1.30 p.m. and from 7 p.m. until midnight on five days of the week. There is no transmission at all on Saturdays or Sundays.

American Service

Compare this with the service given by one American station, KDKA, whose most up-to-date schedule has just reached me. From 8 a.m. until 12 noon Eastern Standard Time (our own Summer Time is six hours later, i.e., 8 a.m. E.S.T. is 2 p.m. B.S.T.) the station transmits on 19.7 metres. At noon a change is made to a wavelength of 25.4 metres, which has been found particularly good during the afternoon. This wavelength is used until 5 p.m. From 5 p.m. until midnight another wavelength is employed—48.8 metres. These transmissions take place at present on Tuesdays, Thursdays, and Saturdays; but they are run by a company, and not by the nation, and they *do* occupy twelve hours of the twenty-four. There is really not the slightest reason why a similar service should not be given from 5SW, and it is obviously our bounden duty to see that it is inaugurated and maintained.

Sheer Bunk!

What, in fact, we should have is something like a twenty-four hours' service. And, as I shall show in a moment, this could quite easily be arranged. I have seen it stated that to conduct such a service would cost £30,000 a year or more. This, I venture to say, is sheer unmitigated bilge. There is no need to put on special programmes, for those of the National transmitter can be relayed. "But," say unbelievers, "the National transmitter doesn't work twenty-four hours a day." True, but there is no special difficulty nowadays about "bottling" programmes by making gramophone records of them. Therefore, an eight hours' programme could be sent fresh from the regional stations' studios from 4 p.m. till midnight every day. From midnight until 8 a.m. the programme could be repeated by means of records and it could run again from 8 a.m. until 4 p.m.

Suitable wavelengths would be required; but so much experimental work has been done, not only at Chelmsford, but also by the American and Dutch stations, that there should be no difficulty in selecting

these. At present 5SW belongs to the Marconi Company, but is leased by the B.B.C. What is the matter with erecting a 10- or 15-kilowatt transmitter either at Brookmans Park or at Daventry? The cost would not be staggering, and relaying would be cheap and easy in either case.

An Interesting Evening

I spent the whole of a recent afternoon and evening with a receiving set which incorporated the new Stenode Radiostat system. I am not going to talk now about the theory or the technical aspects of the business, for that is rather the pidgin of the AMATEUR WIRELESS Technical Staff. Without at present offering an opinion with regard to the value of the invention from a wireless point of view, I will describe to readers the tests made both by the demonstrator and by me—for I was allowed to work the set myself.

An Exacting Test

Some time ago, when we were discussing the Stenode, a friend said to me: "There is only one test that I would ask them to do, and if they could do this I would be completely satisfied." I inquired what the test was. He said: "I would simply say 'receive Stuttgart at full loud-speaker strength without interference in London whilst 2LO is working.'" Since Stuttgart is only 9 kilocycles from the 356-metre Brookmans Park transmitter and is completely blotted out with an ordinary receiving set anywhere in the London Regional area, the test was obviously a good one.

B.P.'s Wobbles

We tuned first of all to Brookmans Park on 356 metres; then a very slight adjustment, and in came Stuttgart, who was giving a piano concerto at the time. We had a little bother with Brookmans Park, for, strange as it may seem, neither of the transmitters is either crystal or tuning-fork controlled, and though you don't notice any wobble on the ordinary receiving set you *do* notice it on one whose tuning is of this hair's-breadth order. There is a very distinct wobble—only a few cycles, I grant you—on B.P.'s transmission. We then tried for various badly heterodyned Continental stations, and in every case we were successful in tuning out the heterodyne and in getting the transmission perfectly free from interference. One of the most striking demonstrations was performed, again in response to a suggestion of mine. If you look at any recent report of the Brussels Laboratory you will find that there is the most appalling mess between 459 and 466 metres. There are about five

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On Your Wavelength! (continued)

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stations working there, none of which is, as a rule, on its proper wavelength. The average separation between stations is of the order of only two or three kilocycles.

A Comparison

We tuned in this chaotic patch first of all on an ultra-modern set incorporating three tuned screen-grid stages. No station could be picked out. Then, when the first adjustments had been roughly made, I was allowed to get to work with the Stenode. Out of the medley I was able to pick up Lyons Doua with no interference at all, and at loud-speaker strength, and after listening to this for a few minutes I did the same with Zurich.

The Super-het. Question

As I was rash enough to predict some time ago would be the case, there appears to be quite a revival of interest in the super-heterodyne receiving set. Many of the "anti-superheteros" were put off some years ago by hearing the noisy and rather distorted reproduction that early receivers of this kind provided. They have got into their heads the idea that the super-het. must necessarily be rather horrible—the dog has been given a bad name, and there you are. I have come across several ultra-modern super-hets. lately—they are all amateur made, so that it is no good asking me for circuit diagrams—which are really wonderful performers. Besides being exceedingly easy to handle, they provide remarkably good quality, combined with an adequate degree of selectivity for present conditions. There is, of course, nothing to beat the super-heterodyne as a distance-getter. Its only real drawback is that it does mean using seven, eight, or nine valves!

The Unit System

Once upon a time the ambition of every wireless man was to own a complete and interchangeable "unit system." The idea of the unit system was to confine the wiring of each stage of high- or low-frequency amplification or detection to its own box and panel, with terminals at each side of the box so that unit could be readily connected to unit. Thus, a wireless amateur might commence his hobby with the acquisition of a tuning unit and a detector-stage unit. After a few months, desiring to "reach out," he built a high-frequency stage and fitted it in between the tuner and the detector, the arrangement of terminal connections making this possible with no alteration to existing internal wiring. Later he might have added low-frequency stages and a microphone relay amplifier; and with six little boxes all in a row and a tiny horn loud-speaker at the end, he considered his receiving station the very "last word" in radio.

Low-loss

Then, suddenly, somebody realised the enormous losses which occurred in the elaborate wiring and switching of unit and similar systems, and the low-loss craze commenced. Low-loss condensers, valve holders, and coils were demanded and supplied, and one enterprising American radio retailer even advertised low-loss filament resistances! Of course, the low-loss idea was merely the commencement of scientific and correct design of the high-frequency side of radio receivers, compared with the old method of hit-or-miss wiring up of odd components to a theoretical diagram. Nevertheless, in a certain form, I am still rather in favour of a unit system.

An L.F. Unit

All of us make changes in our receivers at least every few months; that is, if we are well and truly "afflicted" with the radio germ. But the changes that we make are invariably in the H.F. and detector sides of our sets. Actually, we may rebuild the whole set, but rarely do we change the L.F. end to any marked degree. In any case, the "life" of an L.F. circuit built with modern components is quite long, and it should be possible to build it in a separate unit, ready to be attached to the output of the detector of any H.F. and detector set we may build. A couple of L.F. stages, with the last stage in push-pull, all complete in a box, is quite a handy thing to have about the house.

Loud-speakers at Brooklands

Loud-speakers certainly made themselves heard at the Easter Monday meeting at Brooklands. Announcements and commentaries on the motor races were heard in all parts of the course, and between races the music of gramophone records softened the raucous voices of the gentry who beseeched us to wager. Batteries of four loud-speakers were erected in various parts of the grounds, and curious echo effects were noticeable when the words from a distant loud-speaker bank floated through the air a second or so after the local loud-speakers had had their say. There were also places between the loud-speakers where the sound waves met with equal force and quarrelled, leaving the air strangely silent. These blind spots varied a little in their location, according to the amount of breeze blowing. Loud-speakers and public-address systems do their bit at nearly all important public gatherings nowadays; it seems extraordinary that we ever managed without them!

**NEXT WEEK:
AN ALL-FROM-THE-MAINS
TWO-VALVER**

A Dilemma

It is reported, I see, that the B.B.C. is thinking of changing the wavelength of the National transmitter from 261 metres to 288 metres. There are two reasons why the present wavelength is not satisfactory—First of all, quite a number of pre-1930 sets won't tune down to it satisfactorily and, secondly, fading has been found exceedingly bad even at places within the regional area. At present the 288-metre wavelength is used by a group of relays. Just what would happen to them if the change were made one doesn't know, for presumably if sets won't tune down to a high-power station on 261 metres they will have still greater difficulty in receiving one rated at a fraction of a kilowatt. Fading so far as relays are concerned probably does not matter, since they are never intended to serve areas with a radius greater than five or ten miles.

Yes, But—

Somehow, though, I don't see that an increase from 261 to 288 metres is going to do a power of good, for if the pre-1930 set suffers from the defect of not being able to tune down to 261 metres it is also in many cases afflicted with a certain lack of selectivity, so that it takes all its time to separate "Noisy Nat" from "Raucous Reg," even on their present wavelengths ninety odd metres apart. Reduce the gap between them by 27 metres and an extra special ration of fat will be in an outside in fires. After strenuous efforts, thousands of people have just managed to obtain a degree of selectivity which will separate the twins on their present wavelengths, and if the B.B.C. goes and puts them closer together, these people will have to start all over again.

More Trouble

I foresee further interesting, though probably exasperating, problems as more and more regional stations come into operation, for with the channels at present available (and it is not likely that any change will be made) some of the twins will have to work on wavelengths much closer together than the pair at Brookmans Park. If the Midland Regional sticks to 479 and 1,554 metres, the only other wavelengths available are 399, 377, 310, 301, 242, and either 288 or 261. It will certainly take some set to separate two 30-kilowatt stations in this country working on 301 and 310 metres or the trio on 242, 261, and 288 metres. Even 377 and 399 metres won't be too easy, however far apart geographically the stations using these wavelengths may be situated. For these reasons, those living outside the present swamp area of 2LO should think matters over carefully before they express complete approval of the regional scheme.

THERMION.

FOR LISTENING OFF THE BEATEN TRACK

a set with a reserve of power is required, such as the Philips Model 2511 reviewed in this article by the "Set Tester"

AS the spring days lengthen, distant reception depends less on favourable atmospheric conditions than on the receiver. Listeners who live outside the service area of a broadcasting station find that during the summer months reception of even the nearest station falls off in quality and strength. I am not trying to prove that a big set can overcome the vagaries of the Heaviside layer. But a big set will not have to be pushed to the limit of its capabilities, as would a small set, when atmospheric conditions reduce the strength of stations.

Whether the listener or the desired station is off the beaten track, a powerful set is very much more desirable in the summer months than in winter. One recent evening, before the sun had set, I tried the latest Philips all-electric multi-valver. This is one of the most powerful receivers I have yet tested. It has two stages of high-frequency amplification employing screen-grid valves with indirectly-heated filaments. The detector is also an extremely sensitive mains valve, and the last valve is a super-pentode. Just

street may be prepared to pay. Complete with valves, Model 2511 costs £37 10s.

The specification indicates the scope of the set. It works entirely from A.C. mains and is not suitable either for batteries or D.C. mains operation. Output sockets are provided for the alternative use of moving-coil and cone loud-speakers. The wavelength range is divided into two bands, one going from 200 to 600 metres and the other from 1,000 to 2,000 metres. A gramophone pick-up can be permanently connected to the set without the need for switching.

Although there are three separate stages

A PAGE FOR THE SET BUYER

Every set referred to in this regular feature by "Set Tester" has reached a certain standard of efficiency in the "Amateur Wireless" Laboratory. Reports are not given on sets that fail to reach this standard. This will explain why reports that do appear express general satisfaction with the set's performance.

of tuning, wavelength is varied with a single knob, which controls a three-gang condenser and an illuminated dial. From tests, I can say that the ganging of the three tuned circuits is very accurate. The whole design of the high-frequency side is clever.

Those who have had doubts about the safety of mains-operated sets should have been reassured by the almost universal

compliance of set-makers with the recommendation of the Institution of Electrical Engineers. Model 2511 has an additional safety device; the set can be locked, if desired, and

when locked it is impossible to switch on the mains or to lift the lid protecting the mains apparatus.

As a fitting complement to this set, Messrs. Philips Lamps, Ltd., have produced type-2013 moving-coil loud-speaker, a per-



Note the sturdy construction of the Philips type 2511 set

manent magnet of cobalt steel being employed. Including a step-down transformer, the Philips moving-coil is listed at 15 guineas.

Testing this set was a sheer joy. Stations that on an average set are barely audible on the loud-speaker came in with local-station strength. Such was the ease of operation that I had logged practically every station on the air within half an hour. For such stations as Toulouse, Rome, and Oslo, the volume control had to be used to prevent blasting. Not the least of the joys of the operation was the absence of reaction. The amount of real high-frequency amplification developed by the two screen-grid valves must be immense.

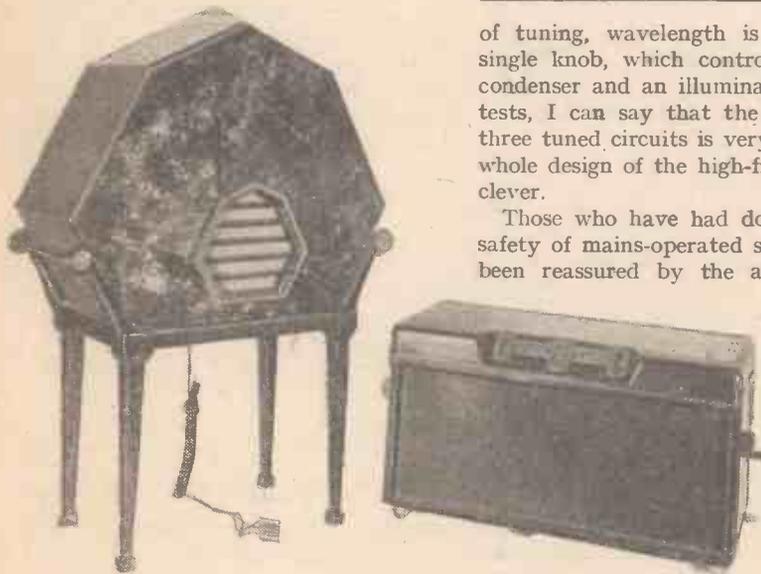
Two knobs only are required for operation. One alters the wavelength and the other controls the volume. Could any set offer greater simplicity? I certainly do not think so, when combined with such excellence of performance.

AT THE QUEEN'S HALL

IT is often supposed that art does not progress. This is not true. The progress of art is in the improvement of the artist's medium. If a musician with Beethoven's genius were to arise now he would find a more tractable technique with which to work than had Beethoven. Mahler, whose "Eighth Symphony" was performed at the last B.B.C. concert of this season, is entitled to respect because he made the musician's medium more all-embracing.

He was not a musician with Beethoven's genius, though he had vision, but he took the symphony form where Beethoven left off, and wrote a symphony for a thousand performers, including every type of instrumentalist and singer. He did not produce a masterpiece, but his aim was high.

L. R. J.



An excellent combination—the Philips A.C. four-valver and moving-coil loud-speaker

what the overall amplification amounts to would be difficult to say. I can only compare the effect of this set with my first experience of a "straight-eight" car. One has a feeling of immense power ready to unleash itself.

Model 2511, as this set is designated, is frankly a luxury set. The price, while not prohibitive, is more than the man in the

"A.W." Solves your Wireless Problems



CORRECT TRACKING

How to avoid undue record wear when using a pick-up

By J. H. REYNER, B.Sc., A.M.I.E.E.

I WAS discussing the question of the tracking of a gramophone pick-up the other day with a friend, and one or two interesting points came to light as a result of our conversation. The argument centred mainly around two points.

The first of these was the question of

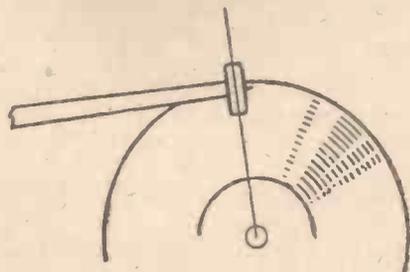


Fig. 1. The plane of the pick-up should be radial with respect to the record track

parallel tracking, about which one hears so much to-day. This, of course, is the arrangement of the pick-up so that the plane of the pick-up itself is always radial with respect to the record track. This point is clear if we look at Fig. 1, for it will be seen that the pick-up shown there is so placed that if we draw a line through the pick-up, this line, if continued, will pass

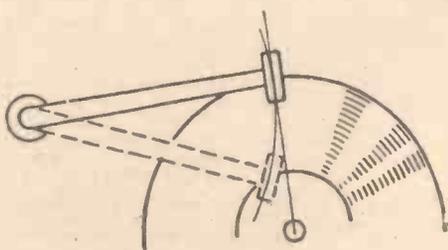


Fig. 3. If the setting is correct at the outside of the record it will not be correct at the inside

through the centre of the record. The variations in the groove on the record are generally produced by a movement of a cutter along a radial line of this type, and if our pick-up is placed as shown in Fig. 1 the needle will be caused to move in exactly the same way, and will, therefore, reproduce the original cutting with the greatest fidelity.

If the pick-up is placed at an angle as shown in Fig. 2, not only will the movements of the needle be different from those of the original cutter, thereby introducing distortion, but if the angle is bad the

pick-up will actually jump from one track to the next on a heavy passage. If we examine Fig. 2 it will be clear that the most natural direction of motion of the needle is along the circle indicated by the dotted line XY. This circle does not coincide with the grooves on the record at all, and on a heavy passage the natural tendency is for the needle to lift itself out of the groove and to follow its own natural circle, which runs in towards the centre of the record, jumping, perhaps, two or three grooves at once.

Even supposing the angle is not sufficiently bad to allow this to happen, there is, nevertheless, a continual pressure on one side of the record groove, since the pick-up is always endeavouring to jump the track, and this inevitably will produce a much heavier wear on the record than if it is correctly located. Consequently, our aim, from the point of view of good reproduc-

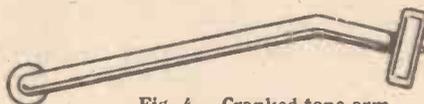


Fig. 4. Cranked tone arm

tion and saving of records, is to arrange that the plane of the pick-up is always disposed on a radial line from the centre of the record.

This, theoretically, can only be attained by the use of a special parallel movement in which the angle of the pick-up is gradually changed as the tone arm moves in from the outside to the inside of the record. We have to use tone arms of relatively short length, and it will be clear from the diagram of Fig. 3 that if we adjust the setting correctly at the outside of the record it will no longer be correct at the inside or vice versa. The ideal remedy is to utilise some form of link mechanism so that the pick-up is gradually rotated as

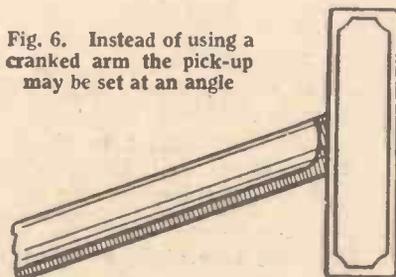


Fig. 6. Instead of using a cranked arm the pick-up may be set at an angle

it reaches the centre; its angle is different at the centre from what it is at the outside. Such an arrangement as the Varley tone arm achieves this object satisfactorily.

There is, however, a somewhat simpler way of producing a very close approximation to true parallel tracking, and this is

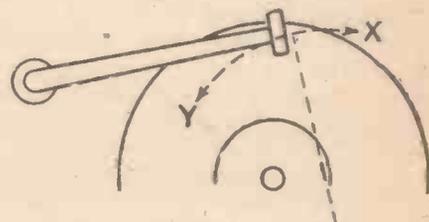


Fig. 2. If the needle is badly aligned it will tend to move along the line XY and jump the track

by the use of the cranked tone arm. There are a number of these on the market, and my friend said that he could not see how any advantage was derived from their use. We were looking at a B.T.H. tone arm, which is bent at the end as shown in Fig. 4; and he contended that the only advantage of this bend was to increase the length of the tone arm by a few inches,

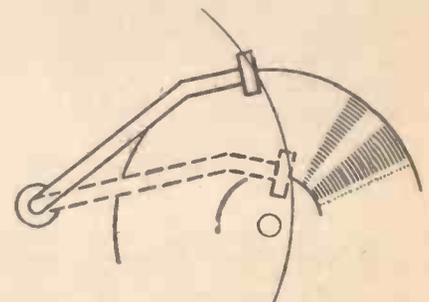


Fig. 5. The correct track of the pick-up

and he could not see how this could make any appreciable difference.

As a matter of fact, the benefit of the cranked tone arm does not arise from any increase in the length, but is due to the fact that the angle of the pick-up changes with its position, which is just what is required, as was shown above.

If we consider Fig. 5, which illustrates two positions of the tone arm, this will be quite clear. When the pick-up is at the outside of the record it will be seen that it is satisfactorily disposed so that the

(Continued at foot of next page)

PUTTING "PEP" INTO VAUDEVILLE



The chorus, directed by Mr. Philip Ridgeway, doing the opening dance before the recent "Period" revue broadcast

A
New
B.B.C.
Idea

He "flicked." The effect on the lethargic cast was galvanic. They leapt into line and immediately plunged into a regular stage opening chorus. Less than five minutes of high kicking and those girls had worked themselves into a genuine feeling of *joie de vivre*.

If the "pep" they displayed to me does not "get over" in the actual broadcasting, I'm afraid the ether is a very phlegmatic medium. (I am writing before the night in question.)

Before the Broadcast

The somewhat racy number I heard was performed for "pep" purposes only. It is not broadcast; but the show itself, in which listeners participate, must certainly gain in that priceless asset—atmosphere. The relaxation of limbs and lungs has an extraordinary toning-up effect. Listeners must have often noticed how broadcast vaudeville shows start without the fire and zest manifested after the first few numbers.

Philip Ridgeway's idea in this "preliminary skirmish" is good. He has contrived to make his show open on a high note of enthusiasm. I think he has succeeded. What do AMATEUR WIRELESS readers who have heard these shows think about them?

A. S. H.

WHEN I entered No. 4 studio at Savoy Hill last week, I was not expecting a "breathless interview" with Philip Ridgeway. But there he was, just getting ready to put "pep" into his group of artistes.

"Before you broadcast a vaudeville show, you simply must overcome the depressing atmosphere of the Studio," he began. "With all these draperies, and this heavily damped carpet, everything is so 'dead' that you can hardly hear yourself speak!"

I agreed. Broadcasting studios always depress me intensely. Their deadliness has

a most evaporating effect on the spirits of broadcasters—especially funny ones.

"My idea in these period vaudeville programmes is to get plenty of 'pep' into artistes before the actual broadcasting starts" explained Philip Ridgeway. He has arranged his programmes in an ascending order of interest, so that the artistes themselves cannot help building up to a final crescendo of "pep."

"The secret is to get the show going at the start—no easy matter in this deadly atmosphere," he continued. "When I say 'flick' you will see for yourself how my plan works."

"CORRECT TRACKING"

(Continued from preceding page)

pick-up is radial. At the centre of the record it will be seen that the pick-up is again on a radius, due to the fact that the pick-up has moved round the record owing to the cranked arm.

It is here that the secret of the cranked tone arm is to be found. If the pick-up had not moved round the record, but had remained on the same radius, or moved back as in Fig. 3, it is clear that it would no longer have been radial.

Viewed from a geometrical standpoint, the effect of the cranked tone arm is to cause the pick-up to rotate about a point situated at a considerable distance—a point, in fact, which changes position as the arm moves in towards the centre of the record, causing the pick-up to rotate, in effect, just as is done mechanically with a link mechanism.

Actually, a cranked tone arm does not entirely solve the problem. The tracking is not absolutely correct over the whole scale, but the arm can be so adjusted that the maximum deviation is a few degrees only. The parallel arm, of course, is correct all the way, and this is the justification for the extra complexity.

The length of the cranked portion has little effect upon the result, the principal factor being the angle at which the pick-up is set with regard to the tone arm. Some tone arms, such as the Limit, have a ball and socket arrangement at the end, whereby the pick-up may be set at the

correct angle. It is then a simple matter of trial and error to determine the angle which gives the closest approximation to parallel tracking.

A Simple Scheme

In cases where a pick-up is already provided with a plain tone arm it is a matter of comparative ease to set the pick-up at an angle on the end of a perfectly plain rod, and this will give the effect of parallel tracking quite satisfactorily. Indeed, Fig. 6 illustrates a pick-up mounted on a plain wooden tone arm in such a manner as to give a satisfactory approximation to parallel tracking, and it will be seen in this case that there is no actual cranked portion at all. The end of the rod is cut off at an angle and the pick-up is mounted thereon directly, this being all that is necessary to achieve the result.

The centre about which a cranked tone arm rotates must clearly be different from that for a plain tone arm, owing to the angle at which the pick-up is set; but, bearing in mind what has been said earlier in this article, it is a matter of comparative simplicity to find the correct centring point so that the plane of the pick-up is always radial. This is the fundamental condition required for the best results.



Clifford Mollison—as Lissenden sees him

SYDNEY MOSELEY'S WEEKLY PROGRAMME CRITICISM

Modern
Language
The
Sandler
Applause

WITHOUT FEAR OR FAVOUR



The
Debates
"Diversions"

I WAS surprised to hear Mr. Agate defend the modern language in *Suspense*. I suggest it is the duty of the B.B.C. to put a check to the disgusting language that is being used in the names of Art and Realism on the stage, in books, and on the films.

So far as the films are concerned, in my talk some time ago I protested that the soldiers as portrayed on the screen were always in drinking dens or in the arms of hoydens. "You would think," I said, "that there were hardly any decent chaps in the war."

Among the letters I received there was one from the head of a family who said: "We broke out into applause when you said that."

And now a revulsion of feeling against this so-called "realism" has become general.

I am grateful to have been allowed to contribute my quota, and I suggest that other speakers who use such a powerful medium as the microphone should similarly work for more decency in the expression of Art.

And now I must protest against the encouragement of prolonged applause which greets every item played by the Sandler band.

You will recollect that I have written again and again of the applause that began at Eastbourne and has followed the band to London. Mr. Sandler gave two encores after his first item, playing items that we have heard many times in a manner no better, no worse, than dozens of other orchestras. Since a good many artistes and orchestras have to do without audible applause, I suggest that Mr. Sandler should discourage this noise by not giving encores.

Relative to my remarks on band programmes, I have received the following comments from a listener who places the bands in the following order of merit:—

1. Ambrose's Band.—Almost perfect.
2. Ambassador Club Band.—Beautifully rhythmic.
3. Splendide Orchestra.—Pleasing "hot" style.
4. Jack Harris's Band.—Good at times.
5. West Endians.
6. Bertini's Band.
7. Jack Payne's Band.
8. Piccadilly Band.—Thin, and needs augmenting and livening up.
9. Sydney Kyte's Band.—As No. 8.

Have any of my readers been listening to the television broadcasts? If so, I should like to hear what they think of them.

Among the many well-known artistes who have appeared before the televisor are: Miss Sybil Thorndike, Mr. Bransby Williams, Mr. De Groot, Miss Gracie Fields, Miss Annie Croft, Miss Desiree Ellinger, Mr. Bobby Howes, and Miss Dorothy Dickson. The well-known violinist, Miss Mercia Stotesbury, who had the privilege of being the first violinist to televise, came over very well.

The debates are becoming more and more impossible. One of the latest, "Living Dangerously," was, like so many of the others, more irritating than illuminating. A lack of sincerity, a mixture of essay, guffaws, and guesswork.

We need a little more businesslike atmosphere in these debates. Miss Rebecca West is by no means an ideal broadcaster. Her voice belies her real strength, and her interjections sound more like a naughty school-girl butting in.

Egotism oozes out of every line of the majority of these debates. The listener is the last person to be admitted into the self-satisfied world of the debaters. It is a cohort of smug, superficial snobs that the B.B.C. is gathering round the microphone these days.



An impression of Peter Warlock

Locker Lampson and Clive Bell seemed to be so excited or exalted at the presence of charming Rebecca that they broke every conceivable rule of debating and, indeed, of chivalry. One of the men—unfortunately we cannot tell who is who in these debates—tried again and again to interrupt Miss West's anecdote of the tram conductor. I have never heard such an expression of bad manners. Thank heaven, there is an alternative programme!

But, before despairing, let me appeal to the B.B.C. to go back to the more orthodox manner of conducting these debates.

Shall one be polite or merely truthful about Mr. Mahler and his musical masterpiece? Well, let's live up to the heading of these weekly notes. It was magnificent, but not music—not the sort of music that even stirs the soul—the commonplace soul. The orchestra, the National Chorus, the boy choristers did yeoman service. Bravo for excellent workmanship! But give me preferably No. 1 on the programme every time: Leonora No. 3 by an ordinary musician named Beethoven.

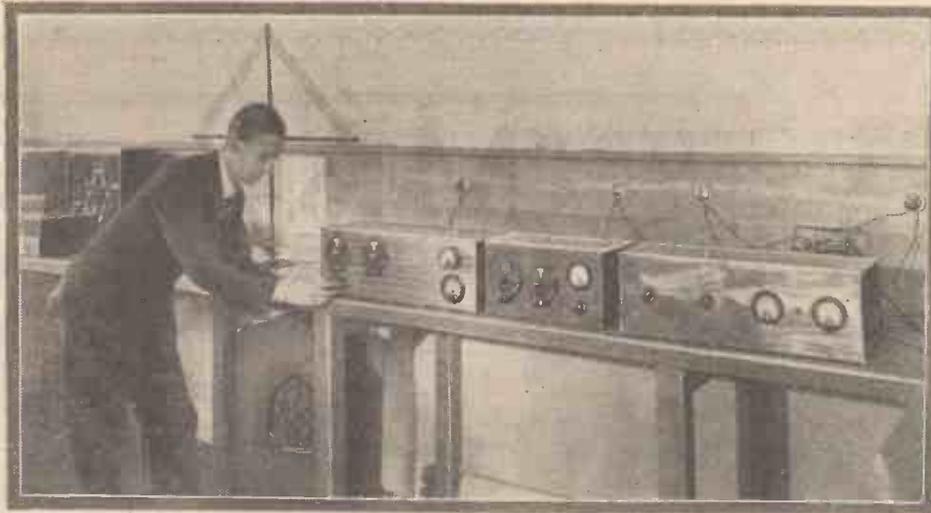
"Diversions" show a commendable and energetic effort to give us something fresh. For which, thanks. The illustrative news stories—or, as we used to call them at school, the object lessons—are interesting. The "night mail" was good; so were the gramophone records of speeches by the rival captains in the Association Football Cup Final.

Whatever "voice" Mr. Philip Snowden may have for House of Commons purposes, that heard through the ether was ideal. Quiet, sincere, and effective. Philip drops an occasional aspirate and the final "g," but he puts over his personality—whether we approve it or not.

Paul Robeson has a voice of rare purity of tone. His recital, therefore, gave much pleasure to listeners. Something new in songs, too.

What explanation has Miss Peggy O'Neil, who failed to give her appeal on behalf of the South London Hospital. The hospital should thank the announcer who deputised most efficiently—and effectively, I hope!

**FIRST
DETAILS
OF THE
STENODE
RADIO-
STAT**



**A
NEW
WIRELESS
INVEN-
TION**

The complete receiving apparatus embodying the new principle of reception

A REMARKABLE SELECTIVITY SYSTEM

IT will be remembered that towards the end of last year a demonstration of a Stenode Radiostat broadcast receiver was given to representatives of AMATEUR WIRELESS and that a number of startling and even sensational claims were made by the inventor for the new system.

The actual demonstration given was described at the time and I handled the apparatus myself. Briefly, a local oscillator was turned on and adjusted to interfere very strongly with the signals from Brookmans Park Regional station, as proved by an ordinary receiver. A loud howl was heard along with the broadcast and could not, of course, be tuned out by the set. The Stenode Radiostat receiver brought in

Brookmans Park without the interference, however, and it was shown that even when the frequency of the local oscillator approached that of the carrier of Brookmans Park the new receiver passed only the programme matter, which was heard without interference.

Now, this demonstration led, in view of the claims made, to various criticisms. A super-heterodyne receiver, suitably modified according to the new system, was used, but tests were practically confined to the local station. It was pointed out that the apparatus might not function on interfering distant stations, as the local oscillator used was not modulated and it would be true to say that some of us had our doubts about the whole matter.

During the last few months an amount of experimental work has been carried out in the laboratories of the corporation, and at the same time the patent position has been cleared, with the result that the British Radiostat Corporation recently felt able to give a very complete demonstration of some of the inventions, so far as they apply to wireless reception and to reveal the circuits used. Accordingly,

representatives from AMATEUR WIRELESS were invited to visit the offices of the corporation to have the system explained and demonstrated.

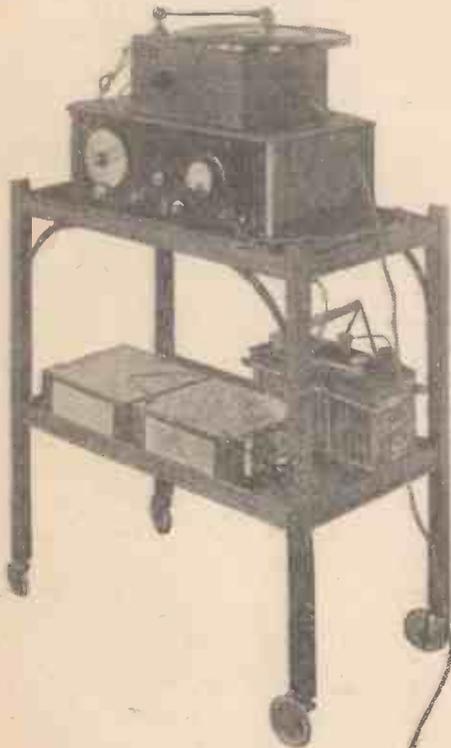
The Circuit

The circuit of the apparatus used is given here. It comprises three parts: first, the receiver for picking up the transmissions; secondly, the device or "gate" which serves to pass the carrier of the signal with a few cycles on either side; and, thirdly, a special detector and magnifier.

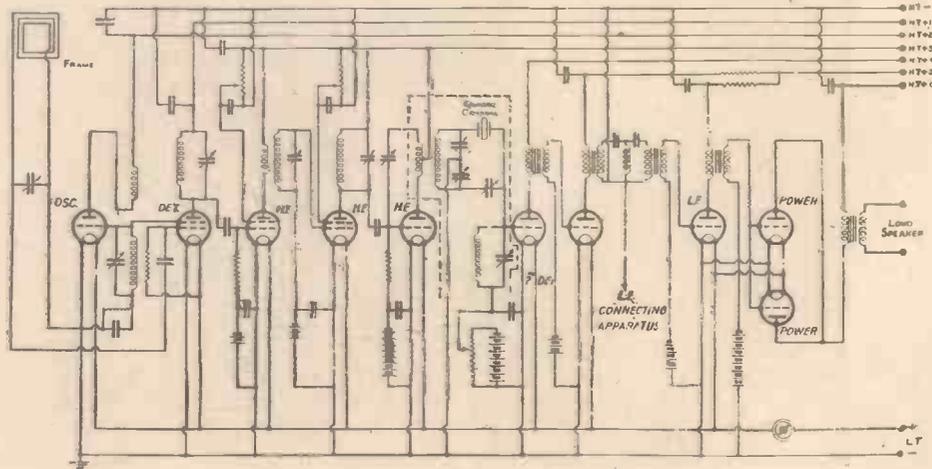
The apparatus functions quite normally so far as tuning is concerned, but, owing to the extreme sharpness of tuning, the finest vernier dials have proved to be too coarse, and actually a tiny variable condenser is connected in parallel with the main control. This single-plate condenser is itself fitted with a slow-motion control, and one complete turn of the knob represents a variation in capacity of only 1 micro-microfarad.

Even so, a station is tuned out by moving the knob a few degrees. In the apparatus demonstrated the actual "gate" is a quartz crystal, having, as is well known,

(Continued on page 630)

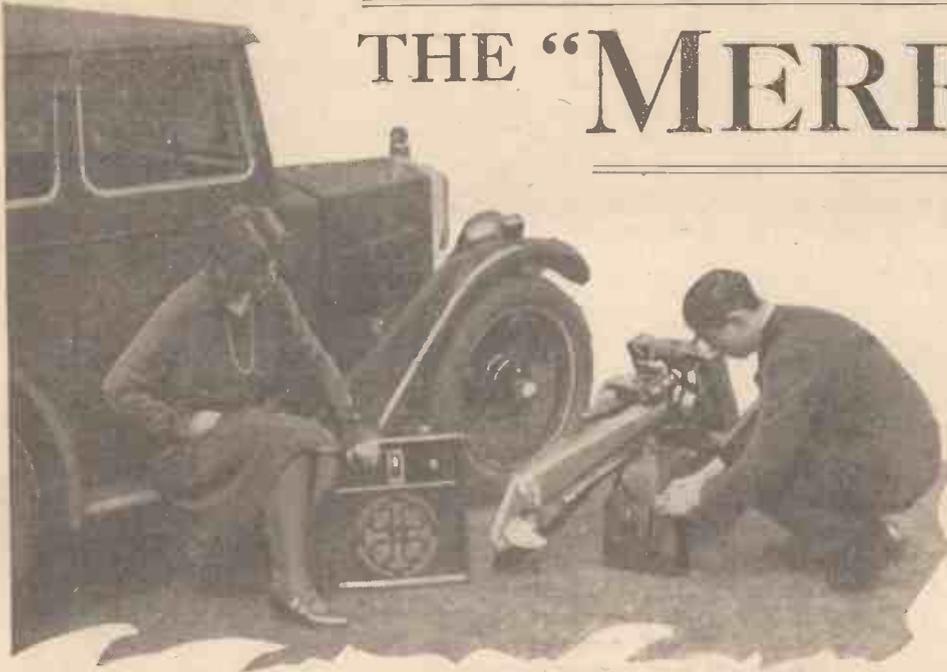


The modulated oscillator for producing interference



The theoretical circuit of the Stenode Radiostat

THE "MERRY-MAK"



FOLLOWING the preliminary details which were given last week of the attractive three-valve portable, the "Merry-maker," many amateurs will be anxious to proceed with the constructional work and to have the set out in the open, pulling in stations, as soon as possible.

Reference must again be made to the blueprint available for the "Merry-maker"; this is a great aid to construction and should be studied in conjunction with these notes. It can be obtained, price 1s. post free, from the Blueprint Department of AMATEUR WIRELESS, 58-61 Fetter Lane, London, E.C.4. The AMATEUR WIRELESS blueprints are full-size and give all the wiring and

the exact positions of the components on baseboard and panel.

The list of components shows that nothing of a special nature, likely to add to the cost, has been incorporated. The total cost is very low and, taking price in conjunction with performance, you will find that this little three-valver, working under the new regional conditions, can beat many of the more ambitious and certainly more expensive multi-valve portables.

Connections

The diagram on page 620 shows the main features of the connections. The frame-aerial winding is very simple, owing to the

fact that no wave-changing is employed. It consists simply of the grid section and the reaction winding. The detector is connected in a very efficient circuit.

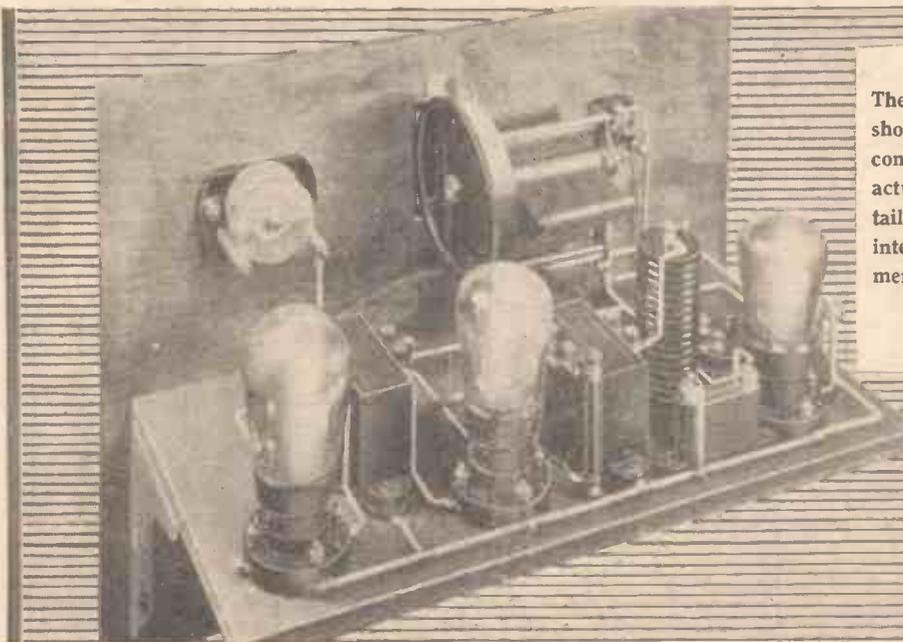
Leaky-grid rectification is employed, of course, because—except at very close range—there is no possibility of the detector grid being overloaded, and so there is no particular advantage to be obtained from the use of anode-bend detection.

Stability

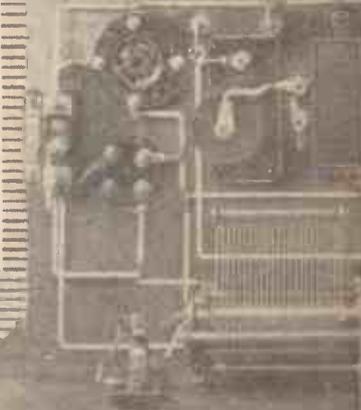
The grid-circuit arrangements include a potentiometer of the pre-set type. This little component has twoappings on a resistance winding shunted by a condenser; and by means of a flex lead and a spade tag the bias on the detector grid can be varied.

To ensure satisfactory working and ease of reaction control, without plopping or motor-boating, an H.F. choke and a grid H.F. stopper resistance are included. Both the L.F. stages are transformer coupled, and with the type of transformer used great amplification is possible without distortion. The transformers are quite light and small, and so no advantage can be gained from putting, say, a resistance coupling unit between the detector and the first low-frequency valve.

The wooden front of the set carries the thumb-control tuning condenser, the reaction condenser, and the on-off switch. Reference has already been made to the



These photographs show clearly the construction of the actual receiver. Detail pictures of the interior arrangements appeared last week



ER" PORTABLE

advantages of thumb control in a portable set. The present condenser arrangement is very neat in appearance and convenient for the layout. The loud-speaker is carried at the back of the fret at the bottom, and the details of the mounting are given on the blueprint.

The cabinet work is really the first job in a portable set; in this case the container can be made up by anyone acquainted with woodwork. Alternatively it can be bought complete. In order that the set shall be strong and of good appearance, a fair degree of accuracy in the woodwork is required, and those who doubt their skill in making a presentable job of the cabinet shell, frame aerial, and front should not waste time and trouble.

The Frame Aerial

The frame aerial box measures $13\frac{3}{8}$ in. by $14\frac{3}{8}$ in. by $6\frac{1}{4}$ in. overall, and it should be noted that it is fitted with plywood fillets, as shown on the blueprint. The winding consists of twelve turns and five turns of No. 24 d.c.c. wire, with a $\frac{1}{8}$ in. spacing between the two windings.

Here are full constructional particulars for a really fine 1930 portable. This "Merry-maker" is a straightforward three-valver, and owing to the Brookmans Park stations and 5GB it will give out-of-doors loud-speaker reception over a very large area. It is a one-control set, and is housed in an attractive cabinet so that it can be used if desired as a transportable set for the house

It will be seen that an ingenious method of holding the batteries in place has been employed. This consists of thick ply-wood mask, in which holes are cut for the two



60-volt H.T. units and the L.T. accumulator. The grid-bias battery is supported in clips at the back of the accumulator. A 9-volt battery is needed.

The construction and the mounting of the loud-speaker is clearly shown in the blue-

print, and a glance at this will be more helpful than many words of description. Note the way in which the cone is attached to the driving rod of the unit. The details of this fixing are clearly given in a small inset drawing on the print.

Testing

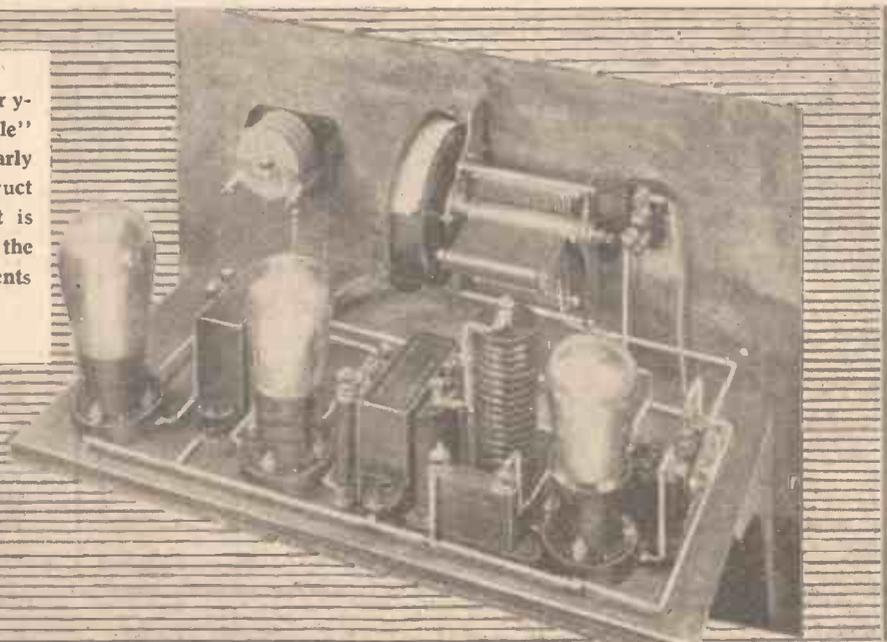
When you have wired up the receiver unit it would be advisable to test the various components of the "Merry-maker" separately. That is, the loud-speaker should be tried on a set—perhaps the family broadcast set—of known performance, and the receiver unit should be tested in conjunction with external batteries and loud-speaker, but of course with the frame aerial. In this way one obviates the possibility of an hour or so wasted in trying to localise the faults which, in the end, probably turn out to be due to one or other of those little snags with which all of us have to contend in set construction.

For a preliminary test you will probably use the valves which are in the broadcast set, but for permanent working of the "Merry-maker" you should choose and use the right

valves.

The detector valve should be of the medium type H.F. valve, such as those in the following list: Two-volts: Cossor 210HF, Dario Univ., Marconi HL210, Osram HL210, Six-Sixty 210HF, Mullard

The "Merry-maker Portable" is particularly easy to construct and the cost is low owing to the few components required



PM1HF, Mazda HL210, Lissen HL210. Four-volts: Mullard PM3, Six-Sixty 4075-HF, Osram L410, Marconi L410, Dario

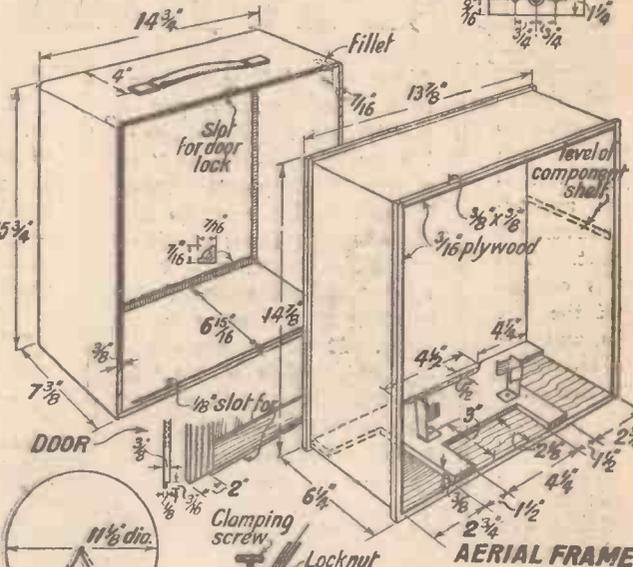
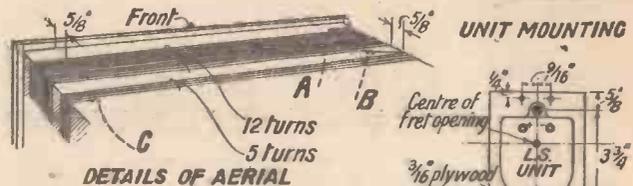
COMPONENTS

- Portable cabinet (Camco "Carrier").
- .0005-microfarad variable drum-control condenser (Burton, Dubilier, Lotus, Polar, Ormond, Keystone).
- .001-microfarad reaction condenser (Keystone, Bulgin, Lissen, J.B., Lotus, Burton, Formo, Polar, Ready-Radio).
- Filament switch (Bulgin, Benjamin, Lissen, Junit, Lotus, Igranic, Claude Lyons).
- Three valve holders (Lotus, Benjamin, Formo, Burton, Brownie, Wearite, W.B., Trix, Junit).
- .0002-microfarad fixed condenser with series-parallel clips (T.C.C., Dubilier, Graham-Farish, Lissen, Watmel, Atlas).
- .001-microfarad fixed condenser (T.C.C., Dubilier, Graham-Farish, Lissen, Watmel, Atlas).
- Two spade terminals, marked L.T.+1, L.T.— (Belling-Lee, Clix, Ealex, Igranic).
- Six wander-plugs, marked: G.B.+1, G.B.—1, G.B.—2, H.T.—, H.T.+1, H.T.+2 (Belling-Lee, Clix, Ealex, Igranic).
- Four-pole balanced armature loud-speaker unit (Lissen, Blue Spot, Watmel, Tunewell).
- Piece of cone paper (Six-Sixty, small size).
- 10-in. square of brown silk for fret.
- Grid-bias battery clip (Bulgin).
- High-frequency choke (Lewcos, Lissen, Ready-Radio, Tunewell, Keystone, Igranic, Bulgin, Wearite, Varley, Polar, Sovereign).
- Two low-frequency transformers, ratios 3 to 1 and 6 to 1 (Igranic type J, Lissen, Telsen, Brownie, Lotus, Varley, Burton, Bulgin).
- 100,000-ohm fixed resistance (Graham-Farish, Ready-Radio, Lissen, Dubilier, Varley, Ediswan).
- 3-megohm grid leak (Lissen, Dubilier, Watmel, Graham-Farish, Igranic).
- Fixed potentiometer (Polar, Lewcos).
- Panel brackets (Lissen, Bulgin, Keystone).
- 4 oz. No. 24 d.c.c. wire (Lewcos, Keystone).
- 2 yds. of thin flex (Lewcoflex, Keystone).
- Connecting wire (Glazite, Keystone, Konekter-kit).

Univ., Cossor 410HF. Six-volts: Cossor 610HF, Marconi HL610, Osram HL610, Six-Sixty D610, Mullard PM5X, Mazda HL607.

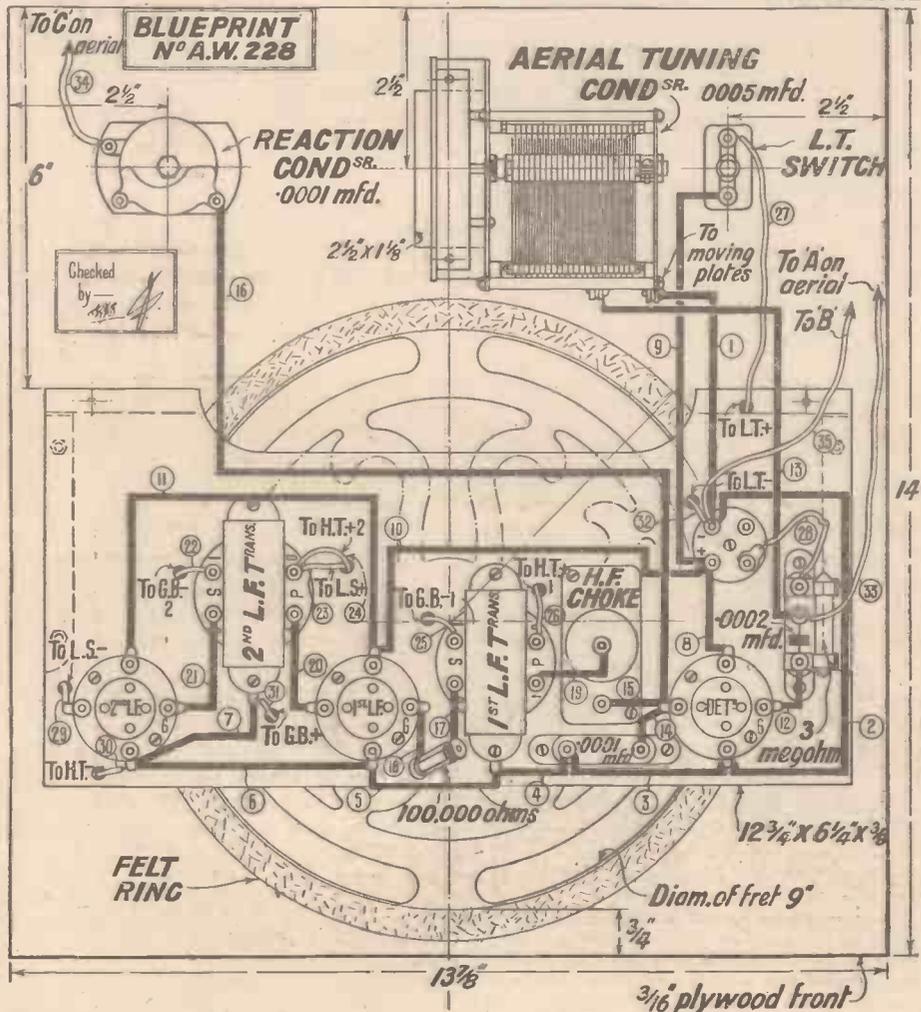
The first L.F. valve can be chosen from the following: Two-volts: Cossor 210LF, Marconi L210, Osram L210, Six-Sixty 210LF, Mullard PM1LF, Mazda L210, Lissen L210, Dario Univ. Four-volts: Mullard PM3, Six-Sixty 410D, Cossor 410LF, Marconi L410, Osram L410, Dario Univ. Six-volts: Cossor 610LF, Marconi HL610, Osram HL610, Six-Sixty D610, Mazda HL607.

The power valve should not be of the super-power type, for the H.T. current consumption would be excessive. It is recommended that the final valve be chosen



FIXING OF DIAPHRAGM

Here are the details of the cabinet, etc., which are included in the full-size blueprint (price 1/-)



The wiring diagram of the "Merry-maker" Portable. A full-size blueprint is available, price 1/-

from the following: Two-volts: Cossor 220P, Dario SP, Marconi P215, Osram P215, Six-Sixty 220P, Mullard PM252, Mazda P220, Lissen P220. Four-volts: Cossor 410P, Dario SP, Marconi P410, Osram P410, Six-Sixty 410P, Mullard PM4. Six-volts: Cossor 610P, Marconi P610, Osram P610, Six-Sixty 610P, Mullard PM6.

As a matter of interest, it was found in the AMATEUR WIRELESS laboratory that with a HL210 in the detector position, L210 as the first L.F., and a P215 power valve, the total H.T. consumption was only 9 milliamps, which is an extraordinarily good figure, well within the working rating of H.T. dry batteries recommended for this set, such as the Ever Ready Popular Portable type.

About 3 volts negative bias was required for the first L.F. valve, and the full 9 volts, of course, for the power valve. As a guide to the wavelength, it was found that the Brookmans Park stations came in at 40 and 70 degrees respectively on the frame tuning condenser scale; the Midland Regional station was picked up at quite fair loud-speaker strength in the London district at about 90 degrees. The tuning was quite easy and, taking into account the directional property of the "Merry-maker's" frame aerial, was very sharp indeed.

Television, for the first time, was recently demonstrated to a Paris audience by M. Jacques Vin.

MUSIC BROUGHT UP SHARP!



Voices in sharp relief; song clear and true; music full of life; that is what the LISSEN Secret Process does for your radio.

Because the current that flows from the large cells of this battery is produced by a new chemical combination and process which makes it pure, silent and sustained. There is never a sign of ripple in the current, never a trace of hum. It flows smoothly from beginning to end of the longest programme, and throughout months and months of use.

PRICES

60 volt (reads 66)	..	7/11
100 volt (reads 108)	..	12/11
120 volt	..	15/10
36 volt	..	4/6
60 volt (super power)	..	13/6
100 volt (super power)	..	22/-
9 volt Grid Bias	..	1/6
4 1/2 volt Pocket Battery,		
5d. each (4/6 doz.)		
Single Cell Torch Battery	4 1/2d.	

You want pure power for your radio; any good wireless dealer will supply you with the Lissen Battery that will give it to you.

MADE IN ENGLAND



LISSEN LIMITED, WORPLE ROAD, ISLEWORTH, Middlesex. Factories also at Richmond (Surrey) and Edmonton (Managing Director: T. N. COLE)

To Ensure Speedy Delivery, Mention "A.W." to Advertisers

"A.W." TESTS OF APPARATUS

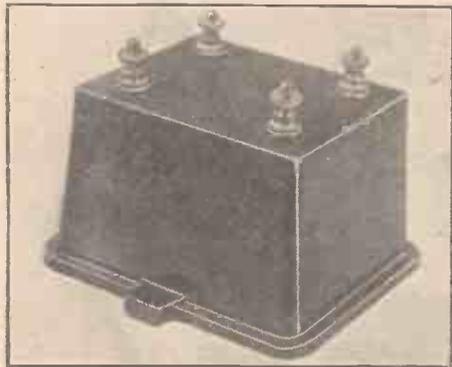
Conducted by our Technical Editor, J. H. REYNER, B.Sc.(Hons.), A.M.I.E.E.

Tunewell L.F. Transformer

THERE is always a demand for an inexpensive low-frequency transformer, capable of giving reasonably good amplification throughout a large portion of the audible frequency register. The bass notes below 200 cycles may be allowed some diminution in strength in many cases.

A Tunewell low-frequency transformer has been submitted for test by Messrs. Turner Co. The windings and iron core of this instrument are housed in a black moulded container, having external dimensions of $3\frac{1}{2}$ in. by 3 in. by $2\frac{1}{2}$ in. high, including terminals. A lug is provided on either side for mounting to the baseboard, and the four terminals are arranged on the top of the casing in a most accessible position. As regards the construction of the transformer, the iron circuit is conventional, and the secondary winding is wound on the top of the primary.

The price of this component is low, so it can hardly be expected to have a high primary inductance, but the figures were rather low for present-day practice. The



A newcomer to the ranks of L.F. transformers—the Tunewell

figures obtained on our inductance bridge under standard operating conditions were 4.5 henries without polarising current, gradually falling to 3.2 henries with increase of D.C. current up to 10 milliamps. The transformer is preferably used after a moderately low impedance detector valve, or in the second stage of a low-frequency amplifier, for there is no tendency for saturation to occur until the D.C. polarising current exceeds 10 milliamps.

Clarke's Atlas Fixed Condenser

WE have received for test a small Atlas fixed condenser, made by Messrs. Clarke & Co., of Manchester. This component is neatly made, the mica-separated copper foil electrodes being housed in a moulded case, with two lugs for mounting

purposes. Connections are made to long soldering tags.

The rated capacity of this condenser was .0025 microfarad, and on test we obtained an exactly similar value. It is particularly



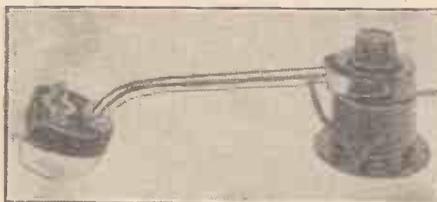
One of the range of Clarke's Atlas fixed condensers

advantageous to the experimenter and constructor to know that the capacity of condensers which he purchases are within a small percentage of the specified value. Any condenser true to its rated value can certainly be recommended. The cost of this .0025-microfarad condenser is 2s. 6d.

Rotor Pick-up

WE have just tested an interesting component known as the Rotor pick-up, made by Messrs. Peter Grassman, and marketed in this country by Messrs. The Rotor Electric, Ltd.

This unit, although conventional in design, is distinctive in appearance. The armature is lightly damped to eliminate record wear, and the magnet system is attached to a light metal tube, forming the tone arm, by a rubber-washer. The length of the complete tone-arm, from swivel to needle-point, is approximately 7 in. Under these conditions, of course, the tracking cannot be correct throughout the compass of the record, but correct tracking arms, however, are still the exception rather than the rule. A particularly smooth operating volume control is housed in the support to the tone arm, and gives excellent graduation of volume. A novel feature consists in the provision of a mica window, allowing inspection of the armature.



The Rotor combined pick-up and arm

This pick-up was subjected to a critical and practical test with the standard amplifier equipment of the laboratories. In comparison with our standard pick-up of known

characteristics, it performed very favourably, and in the opinion of a trained musician gave very evenly balanced reproduction throughout the audible register. At the higher frequencies it was, perhaps, slightly too brilliant. This, however, is an advantage on some recordings, giving live and penetrating qualities to the speech and music.

At a price of 42s. complete, this pick-up and volume control can be recommended to readers.

THE B.B.C. AND THE HALLÉ ORCHESTRA

AN important agreement has been made between the B.B.C. and the Hallé Society, marking one of the boldest steps ever taken in broadcasting in the provinces. The Hallé Orchestra is to give a series of concerts during the summer at Manchester, Liverpool, and Leeds on the lines of the London "promenade" concerts. The prices of admission will be low and smoking will be permitted, while the programmes will include both symphonic and lighter works, choral items, and soloists. The conductor will be Sir Hamilton Harty, and the concerts will be used as contributions to the B.B.C. programmes.

The season will open on May 26 with a fortnight of concerts at the Free Trade Hall, Manchester. The Hallé Orchestra will then move to Liverpool, where concerts will be given for a week, commencing June 9 in the Philharmonic Hall. Finally, there will be a week at the Town Hall, Leeds, from June 16 to 21. The Hallé Chorus will also be heard at Manchester, and local choral societies will collaborate at Leeds and Liverpool.

A New Amplion Speaker.—The Amplicon type AC.8 cabinet cone loud-speaker is a newcomer to the ranks of high-performance low-price instruments, and it is fully described in the test report published in No. 410. It should be noted that, although the performance and quality of reproduction are well above the average for a loud-speaker of this type, the price is only £2 2s. Particulars may be obtained from Graham Amplicon, Ltd., of 26 Savile Row, Regent Street, W.1.

It should be noted that the wavelength range of the Chakophone aerial tuner, made by the Eagle Engineering Co., Ltd., of Eagle Works, Warwick, is 200 to 2,000 metres. The minimum is not 300 metres, as stated in the advertisement on page 543, No. 409.



It's firmly clamped

Unvarying capacity is positively assured with a Dubilier Mica Condenser. Take, for instance, the Type 610 Condenser illustrated—before the "element" is sealed into the moulded case it is tightly clamped, so that absolute constancy of capacity is ensured. This is just one example of the way in which Dubilier safeguard the efficiency of their Condensers—Condensers which have gained a world-wide reputation for absolute reliability.

DUBILIER MICA CONDENSERS

Type 610 (Horizontal) and Type 620 (Vertical). Test Voltage, 500 A.C.

.00005 to .0009	2/6
.001 to .006	3/-
.007 to .009	3/6

Type B775, Tested at 500 V. D.C. Specially suitable for use in resistance-capacity coupled amplifiers, also where a condenser is required to withstand potentials of several hundred volts.

.01, 4/-; .1, 8/6; .5, 37/6

Intermediate capacities at proportionate prices.

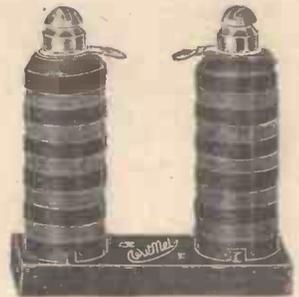
If unobtainable from your dealer, write direct to us giving his name and address, Dubilier Condenser Co. (1925), Ltd., Ducon Works, Victoria Road, North Acton, London, W.3.

Ask your dealer for the Dubilier Booklet—"A Bit about a Battery"—it's free.

Find those distant stations



WATMEL BINOCULAR H.F. CHOKE TYPE DX2



In the Watmel Binocular H.F. Choke, every detail in design has been carefully investigated with a view to obtaining the greatest possible efficiency in high-frequency work.

The Choke is of the inverted "V" windings type, having an extremely restricted field.

It is of very low minimum self-capacity, with special low loss formers and terminals mounted on top.

Inductance always remains constant.

It is mounted on a moulded Bakelite base, and over all measures only 2" long by 3/4" high.

4/-

- BALANCED ARMATURE UNIT 18/6
- WAVE TRAP - - - - 8/6
- TUNER UNIT - - - - 12/6

★ Send for our Folder No. A. 85, showing you how to make up a fine loud-speaker: also Folder and Blueprint for building a modern 3-valve set.



WATMEL WIRELESS Co., Ltd., Imperial Works, High Street, Edgware. Telephone: Edgware 0323.

MY WIRELESS

DEN *By* W. JAMES



Weekly Tips,
Constructional and Theoretical—

For the
Wireless Amateur

Detectors and By-pass Condensers

THE anode-bend detector, as is well known, is capable of rectifying strong signals with but little distortion. Sometimes, however, the detector is not properly set up, with the result that selectivity, quality of reproduction, or volume are affected.

You may well wonder how the setting of the detector can possibly affect these three things, but the fact is that the detector is a vital part of a set.

Take selectivity, for instance, with too small a grid bias; grid current will flow at times, thus broadening the tuning. Then again there is the by-pass condenser. If this has too low a value, the tuning is not so sharp as it might be.

The efficiency of the detector, and therefore the volume, is also affected by the size of the by-pass condenser and to an extent by the value of the grid bias. If the bias is not correct for the anode voltage used, and if the condenser is too small, the efficiency of the detector is reduced. Quality may be affected by these two parts having unsuitable values.

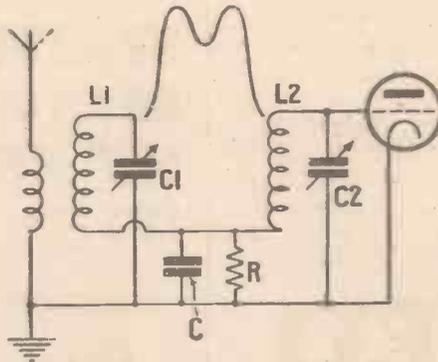
It is therefore necessary to set up an anode-bend detector with care. A .0003 microfarad by-pass condenser will usually be satisfactory from all points of view, and the grid bias must be adjusted to suit the high tension. Always have the high-tension voltage to the detector as high as possible.

A Band-pass Filter

A filter having a band-pass characteristic may readily be constructed as indicated in the accompanying diagram. This high-

frequency filter is of the capacity type, from which it follows that the coupling of the two circuits is provided by a condenser common to both.

The coupling condenser is marked *c* in the figure. In this circuit the two coils, *L1* and *L2*, should be of identical construction, excepting that coil *L1* is fitted with a



The filter having a band-pass characteristic, referred to by W. James in the accompanying paragraph.

primary for the aerial and earth. Tuning condensers *c1* and *c2* should also match, although it may be necessary to join a trimming condenser across *c2*.

The two coils should be shielded or else be so arranged that they do not couple—either magnetically or electrostatically.

I am aware that a mixed coupling may be used, but this is best avoided when first

trying out the arrangement. The width of the band to which the circuit responds is decided by the characteristics of the coils and the size of the condenser *c*. A usual value for *c* is .015 microfarad, but larger values should be tried.

If too small a value is used, the tuning curve will have two pronounced peaks, as indicated, and speech will sound strange, the higher frequencies being greatly emphasised. This is a good circuit to try. Do not forget the grid leak *R*. If this is left out the grid of the valve will not have a path to the filament.

How Would You—?

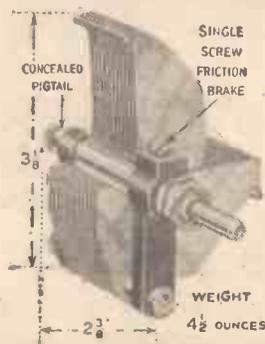
If you had two loud-speakers of different resistances and wanted to use them together, how would you connect them?

This question was asked me the other day and obviously there is something in it, as there are several ways. In the first place the speakers could be connected in series, but this might result in the sound from one being much greater than from the other.

If they are joined in parallel, a similar result might also be obtained. Then again you could connect the high-resistance one in the anode circuit and the low-resistance one to a transformer. This arrangement might be satisfactory, but there are further methods.

A transformer having a tapped secondary could be fitted and the two loud-speakers be connected to suitable points on the secondary. As an alternative to this, two transformers of the correct ratio could be used and their primaries be joined in series or parallel according to the output valve used.

"1930" LOG (MID-LINE) CONDENSER



In four Capacities:
.0005
.00035
.00025
*.00015

4/6
each

WEIGHT 4½ OUNCES
*Double spacing of vanes for Ultra Short-wave work.

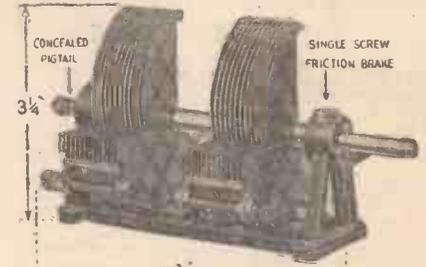
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SELF-OILING BEARINGS
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DUAL GANG CONDENSER



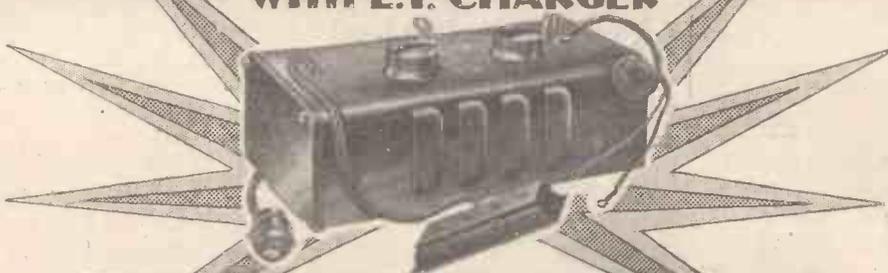
CAPACITY .0005 MFD.

15/6



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Fits inside any Portable, and specially designed to meet their exacting requirements as regards critical values of High Tension Voltage, and sensitivity to stray electrical fields. It is, of course, equally suitable for all popular 2-, 3-, and 4-valve Receivers. Write for **FREE ART BOOKLET**, "Radio from the Mains."

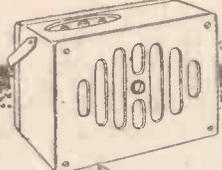
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200/250 volts. Size: 9 in. x 5 in. x 3 1/4 in. H.T. Output: 130 volts at 20 m.a. H.T. Tappings: 2 continuously variable. 1 Power. L.T.: Trickle Charger for 2-, 4- or 6-v. accumulators. Price £4 : 5 : 0

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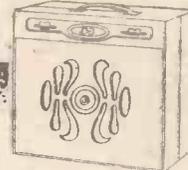
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REGENT RADIO SUPPLY CO. 21, Bartlett's Bldgs, Holborn Circus, London, E.C.4 Telephone CENTRAL 6745/67

NATIONAL



MARCONIPHONE



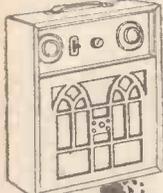
PORTADYNE



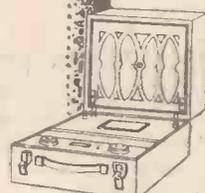
PYE



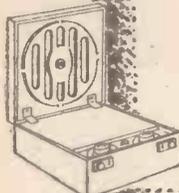
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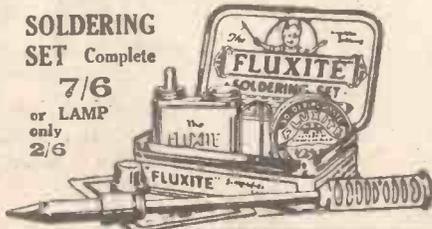


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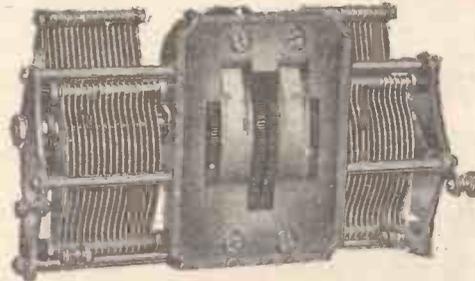
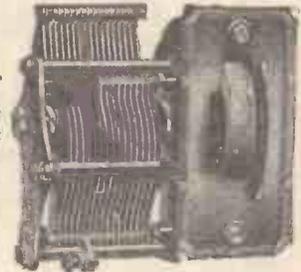


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MERRY-MAKER PORTABLE

Specially selected for the Merry-maker 3-valve portable (described in this issue) is the Burton '0005 Single Drum Control Condenser. This condenser complete with fast and slow motion Drum Control costs 12/6

With plain Drum Control 10/6



The Twin Condenser complete with fast and slow motion Drum Control 25/-

With plain Drum Control 21/-

BURTON CONDENSERS

C. F. & H. BURTON, Progress Works, Walsall

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Summer Time is Portable Time

MERRY-MAKER PORTABLE

COMPONENTS		£	s.	d.
1	.0005 var. drum control condenser (Burton)	12	6	
1	.0001 reaction condenser and knob (Formo)	3	3	
1	Filament switch (Bulgin)	1	6	
3	Valve holders (Lotus)	3	9	
1	.0002 fixed condenser, series-parallel clip (T.C.C.)	2	4	
1	.0001 fixed condenser (Graham-Farish)	1	0	
2	Spade terminals, named (Belling-Lee)	1	9	
6	Wander plugs, named: G.B.+1, G.B.-1, G.B.-2, H.T., H.T.+1, H.T.+2	1	9	
2	Grid-bias battery clips	5	6	
1	H.F. choke (Bulgin)	1	15	0
2	L.F. transformers, ratios 3/1 and 6/1 (Igranic J.)	2	3	
1	100,000-ohm resistance (Graham-Farish)	2	6	
1	3-meg. grid leak (Dubilier)	2	0	
1	Fixed potentiometer (Polar)	2	0	
2	Yards thin flex and 10 ft. Glazite	1	0	
		£3	15	10

1 P. B. R. oak portable cabinet complete with Blue Spot cone speaker and frame aerial ... 2 18 6
Valves 33/6, H.T. and I.T. batteries 33/-
Call on us to see and hear it.

THE WAVELETS TWO

Kit as specified on Page 620 (less valves) 4 0 0
Eliminators for A.C. Mains
Ekeo Model IV20, 3 tappings SG, 0/120, 120/150 4 12 6
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2 var. and power tappings and trickle charger

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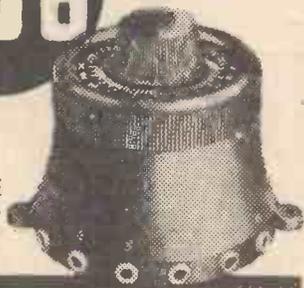
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BROWNIE SELECTIVITY UNIT

Mr. F. T. Collins, of East Barnet, writes: "Although I am within 6 miles of Brookman's Park, I find the Brownie Selectivity Unit enables me to separate either wave length without the least difficulty. I feel that your Unit is the only relief for listeners in this area." Screen-Grid selectivity with any set—

that's what you get with the Brownie Selectivity Unit, at a cost of only 10/6! Your dealer will tell you all about it.

10/6



BROWNIE WIRELESS CO., (G.B.) LTD., Nelson St. Works, London, N.W.1.



ON the occasion of the Royal Academy dinner at Burlington House, on May 3, various toasts will be proposed by the Duke of York, Lord Thomson, Lord Parmoor, Lord Macmillan, Lord Moynihan, and the president of the Royal Academy, Sir William Llewellyn; the speeches will be relayed to London Regional.

"The Pool of London at Night" is the title of the main feature in the ninth of the "Diversions" series, for transmission on May 9. From a launch accompanying the river police, Mr. J. C. Squire will furnish a description of the nightly search made of wharves, piers, and river east of Wapping.

Red Pepper, with Violet Loraine in the cast, will be given as part of the National vaudeville programme on May 7; other artistes in the "bill" are Muriel George and Ernest Butcher, Geoffrey Gibson, and Cyril Shields. On May 10, the variety entertainment for London Regional includes Claude Hulbert and Enid Trevor, Hatch and Carpenter (negro singers), Billy Mayerl, Dorothy McBlain, and Lady Wilbraham's sketch entitled *Time*.

Through the National transmitter, on May 5, listeners will be given an opportunity of hearing a truly international programme. The artistes engaged for this broadcast represent France (Yvette Darnac), Russia (The Bayan Singers), Italy (Mario de Pietro), Germany (Gerta Keller), England (Wish Wynne), and America (Stuart Ross and Joe Sargent).

Although little publicity has been given to the activities of the Post Office authorities, it is stated that successful prosecutions of pirates for the evasion of the licence averages three for each week-day since October, 1925, to the present date.

At the eleventh hour Spain decided that Greenwich Mean Time should be retained during the summer months; no alteration, therefore, has been made to the clocks in that country.

The North Regional broadcasting station now under construction at Slaithwaite, near Huddersfield (Yorks); will possess three 500-ft. steel lattice masts for the support of the twin aerials.

In Germany experiments have proved that better results are obtained by non-metallic aerial structures, and for the new high-power stations wooden masts only are to be used.

The number of registered listeners in

Germany on April 1 last reached a total of 3,238,396.

The date of the formal opening of the new Vatican City short-wave wireless station has been tentatively fixed for June 29. It is stated that in the course of the ceremony the Pope will broadcast a message to the world.

Although Great Britain, France, and Belgium, adopted Summer Time on April 13 last, Holland will not effect this change-over before May 15 next. It should be borne in mind that Algeria and Morocco retain G.M.T. throughout the year.

It is understood that the Post Office authorities, encouraged by the success of their radio detective van in England in bringing in applications for wireless licences, are again contemplating sending the van on a tour of Scotland. Officials are still disposed to think that beyond the Tweed, and particularly in remote country districts, there are many unlicensed sets in use.

Complaint is being made in the north at the reluctance of the Scottish Football Association to permit the broadcasting of important matches.

Though the new Scottish Sub-Council for School Broadcasting is now functioning, the results of its work will not be apparent till next year.

Glasgow's broadcast concert party, the Radioptimists, are branching out in a new form of entertainment. Hitherto their programmes have nearly always been in the form of small radio revues, but their latest effort is on the lines of an ordinary vaudeville broadcast. Each member of the party has been asked to prepare a separate turn, and there is considerable rivalry as to who can earn the distinction of being the best turn of the evening.

A dispatch from Washington states that a bill has been introduced in the Senate asking the Department of Justice to investigate the exchange of shares between the Radio Corporation of America, Westinghouse and General Electric, alleging that this would be the beginning of a new radio trust.

The new broadcasting studios of WLW, Cincinnati, are protected by ten "noise-proof" doors, each weighing more than 800 lb. The doors cost £900 each.

According to a recent report of the Federal Radio Commission, the yearly total broadcasting time for all radio stations in the United States is 1,252,802 hours.

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B.B.C. Brookman's Park Set	AW206
Regional Crystal Set	WM176
ONE-VALVE SETS (1s. each)	
B.B.C. Official One	AW208
A.1	WM153
TWO-VALVE SETS (1s. each)	
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Talisman Two (D, Trans)	AW194
Hyper-selective Two (D, Trans)	AW198
British Broadcast Two (D, Trans)	AW215
Easy-tune Two (D, Trans)	AW226
Wavelets Two (D, Trans)	AW229
Clipper Two (D, Trans)	WM135
Ether Ranger (D, Trans)	WM156
Brookman's Two (D, Trans)	WM168
A.C. Two (D, Trans)	WM175
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Radio-Record Two (SG, D)	WM187
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All-wave High-mag. Three (D, 2 Trans)	AW199
Knife-edge Three (D, RC, Trans)	AW201
Talisman Two-three (D, RC, Trans)	AW203A
Wide World short-wave Three (HF, D, Trans)	AW207
Everybody's Three (SG, D, Trans)	AW209
1930 Ether Searcher (SG, D, Trans)	AW211
New All-Britain Three (HF, D, Trans)	AW214
Best-by-Ballot Three (SG, D, Trans) Price 4d. free with copy of "AW"	AW217
Brookman's By-pass Three (D, 2 Trans)	AW220
Everybody's all-electric Three (SG, D, Trans)	AW221
-A.C.	AW223
1930 Clarion Three (SG, D, Trans)	AW225
Auto-coupler Three (D, 2LF)	WM117
Standard Coil Three (HF, D, Trans)	WM142
Short-wave Link (D, RC, Trans)	WM157
Fanfare (D, 2 Trans)	WM161
Brookman's Three (SG, D, Trans)	WM164
Community Three (D, RC, Trans)	WM167
New Q3 (SG, D, Pentode)	WM170
Brookman's Push-Pull Three (HF, D, 2 Trans) 1/6	WM173
Celerity Three (SG, D, Trans)	WM178
All-nations Three (D, 2 Trans)	WM179
Inceptordyne (SG, D, Pentode)	WM184
Brookman's A.C. Three (SG, D, Trans) 1/6	WM184
Music Marshal (D, 2 Trans)	WM190
FOUR-VALVE SETS (1s. 6d. each)	
Clarion All-electric Three (SG, D, Trans)	AW200
A.C. Rectifier	AW202A
Music-Lover's Gramo-radio (SG, D, RC, Trans)—1s. 6d.	AW202B
Music-Lover's Gramo-radio (Loud-speaker)—1s.	WM122
Standard-coil Four (HF, D, 2 RC)	WM134
Dominions Four (2SG, D, Trans)	WM140
Short-wave Adaptor for Dominions Four	WM144
Music Player (HF, D, RC, Trans)	WM154
Arrow (SG, HF, D, Trans)	WM158
1930 Monodial (2SG, D, Trans)	WM162
Electric Four (All A.C.—SG, D, RC, Trans)	WM165
Outpost Four (SG, D, 2 Trans)	WM174
Brookman's Four (2SG, D, Trans)	WM180
Transportable Four (SG, D, 2 RC)	WM189
Super Q (SG, D, 2 Trans)	WM193
Lodestone Four (HF, D, RC, Trans)	WM194
Searcher's Four (SG, D, RC, Trans)	WM194
FIVE-VALVE SETS (1s. 6d. each)	
James Quality Five (2SG, D, RC, Trans)	AW227
All-wave Lodestone Five (HF, D, RC, Push-pull)	WM146
1930 Five (2HF, D, RC, Trans)	WM171
Dual-screen Five (2SG, D, RC, Trans)	WM185
Radio-Record Five (SG, D, Trans-parallel)	WM188
Overseas Five (3SG, D, Trans)	WM191
AMPLIFIERS (1s. each)	
A.W. Gramophone Amplifier	AW205
Beginner's Amplifier (1v.) 9d.	AW210
Brookman's Separator (HF Unit)	AW212
Two-valve Amplifier	AW216
"Mag" Gramo Unit	AW224
Concentrator H.F. Unit	WM169
Radio-Record Amplifier (DC Mains)	WM183
MISCELLANEOUS (1s. each)	
Short-wave Adaptor (1 v.)	AW183
High-tension Battery Charger	AW191
Simplest H.T. Unit	AW197
By-pass Unit (Wavetrap) with copy "AW"—4d.	AW218
Home-constructors' Loud-speaker (pleated paper)	AW219
"Twin" Brookman's By-pass (6d.)	AW 222
James H.T. Unit for D.C. Mains	WM133
Two Ampere Low-tension Unit	WM147
A.C. Mains Amplifier	WM149
H.T. Unit for A.C. Mains	WM159
"W.M." Linen-diaphragm	WM172
Trimmer (Selectivity Unit) (6d.)	WM181
Brookman's "Wipe-outs"	WM186
Short-wave adaptor for Overseas Five	WM192
PORTABLE SETS	
Holiday Portable Three (D, RC, Trans)	AW188 1/-
Music Leader (SG, D, RC, Trans) with copy "AW"	AW203 -/4
Merry-maker Portable (D, 2 Trans)	AW228 1/-
Wavfarer Portable (Super Het)	WM130 1/6
Pedlar Portable (D, Trans)	WM195 1/-

RADIO DEVELOPMENTS IN NORWAY

BOTH the geographical position and the geological conditions of Norway are such that although the country possesses but a small population, a large number of transmitting stations is needed to secure an adequate broadcasting service to all districts.

It had been hoped that the installation of the present high-power transmitter at Oslo would have solved these difficulties, but from the tests made it has been clearly demonstrated that the retention of a number of relays is still a necessity.

Contrary to the original scheme, the smaller plants at Frederiksstad, Hamar and Porsgrund will remain in operation to take the capital programme. The 1.2 kilowatt transmitter hitherto used at Oslo has been transferred to Trondhjem (Nidaros) where it will carry out its tests within the next week or so. To complete the plan of reorganisation 500-watt relays are to be installed at Kristiansand, Stavanger and Bode; they will broadcast respectively on 240 metres, 235 metres, and on a common wavelength still to be determined.

During the coming summer experiments are to be made at Oslo with a view to finding a suitable wavelength between 1,060 and 1,260 metres as a favourable channel on which the Oslo high-power station could operate without interference. If the attempts meet with success the exclusive wave of 493.4 metres now used could be allotted to some of the relays.

GRIDDA.

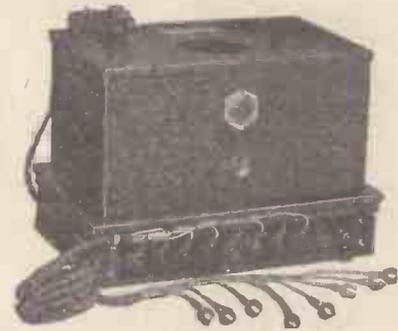
A Washington dispatch states that the U.S. Bureau of Standards is planning an extensive study of static and fading in radio. A bill which has passed the House and is now in the Senate provides for the purchase of a test site of more than 200 acres near Washington, and for the purchase of necessary apparatus.

Radio reception in the Arctic has been particularly good of late, according to reports from various detachments of the Royal Canadian Mounted Police in the far north. The station at Herschell Island, in the Arctic Ocean, picked up 70 American stations, 8 Canadian, 1 English, 4 German, and a number of others from foreign countries, including Japan.

The first two-way public demonstration of television was given in New York recently by the Bell Telephone laboratories. Two groups of newspaper men, stationed three miles apart, successfully exchanged conversations while seeing each other. The apparatus used in the test was the invention of Dr. Herbert E. Ives.

Amateurs in Czecho-Slovakia received authority to operate short-wave transmitters for the first time at the beginning of this year.

The LOTUS All-Mains Unit



Converts an Osram "MUSIC MAGNET" to an ALL-ELECTRIC SET with minimum trouble and maximum effect

In less than five minutes, by using the Lotus All-Mains Unit, you can turn your Music Magnet Receiver into All-Electric.

Make this change and effect a saving of nearly £4 a year, by dispensing with batteries. Send for full particulars.

Cash Price £7.7.0 (or 14/6 down and 11 similar monthly payments).

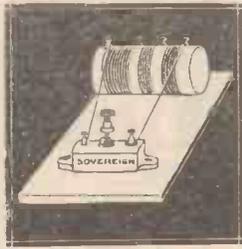
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The "Sovereign" Station Selector absolutely cuts out programme interference. Sold complete, with straightforward wiring plan and diagram. Connected to your set in a moment. From all radio shops or direct from the manufacturers—post free.

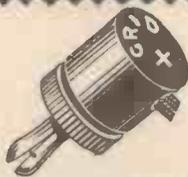
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Broadcasting stations classified by country and in order of wavelengths: For the purpose of better comparison, the power indicated is aerial energy.

Metres	Kilo-cycles	Station and Call Sign	Power (kw.)	Metres	Kilo-cycles	Station and Call Sign	Power (kw.)	Metres	Kilo-cycles	Station and Call Sign	Power (kw.)				
GREAT BRITAIN				GERMANY				LATVIA							
25.53	11,751	Chelmsford	15.0	203	1,022	Strasbourg	0.5	*525	272	Riga	7.0				
*200	1,500	Leeds (2LS)	0.13	*272	1,102	Rennes (PTI)	0.5	LITHUANIA							
*242	1,238	Belfast (2BE)	1.0	286	1,040	Radio Lyons	0.5	1,035	155	Kovno	7.0				
*261	1,143	London Nat.	30.0	*310	950	Montpellier	0.3	NORTH AFRICA							
*288.5	1,040	Newcastle (5NO)	1.0	293	1,022	Limoges (PTT)	0.5	361	825	Algiers (PTT)	16.0				
288.5	1,040	Swansea (5SX)	0.13	*04	956	Bordeaux (PTI)	1.0	412	427	Radio Maroc	10.0				
228.5	1,040	Stoke-on-Trent	0.13	308	973	Radio Vitus	1.0	(Rabat)							
228.5	1,040	Sheffield (6LF)	0.13	*310	950	Marseilles (PTT)	0.5	1,250	240	Tunis Kasbah	0.5				
288.5	1,040	Plymouth (5PY)	0.13	329	914	Poste Parisien	0.5	NORWAY							
288.5	1,040	Liverpool (6LV)	0.13	322	905	Grenoble (PTT)	0.3	304	824	Bergen	1.0				
288.5	1,040	Hull (6KH)	0.13	370	810	Radio LL (Paris)	0.5	385	779	Frederiksstad	0.7				
288.5	1,040	Edinburgh	0.13	*381	788	Radio Toulouze	8.0	445	674	Rjukan	0.13				
288.5	1,040	Dundee (2EH)	0.35	447	671	Paris (Etat)	3.0	453	662	Aalesund	0.3				
288.5	1,040	Bournemouth	0.13	466	644	Lyons (PTT)	5.0	453	662	Tromsø	0.1				
288.5	1,040	Bradford (2LS)	0.13	1,446	207	Eiffel Tower	12.0	453	662	Porsgrund	0.7				
*301	995	Aberdeen (2BD)	1.0	*1,725	174	Radio Paris	16.0	*493	608	Oslo	60.0				
*310	963	Cardiff (5WA)	1.0	GERMANY				POLAND							
*356	842	London Reg.	30.0	*215.3	393	Flensburg	0.5	214	1,400	Warsaw (2)	2.0				
*377	797	Manchester	1.0	*227	1,319	Cologne	4.0	231	1,283	Lodz	1.5				
*399	757	Glasgow (5SC)	1.0	*232.2	1,292	Kiel	0.35	*213	959	Cracow	0.5				
*479	626	Midland Reg.	25.0	*231	1,283	Münster	3.0	*335	196	Posnan	1.2				
1,554	193	Daveentry (5XX)	25.0	*239	1,256	Nürnberg	2.0	385	779	Wilno	0.5				
AUSTRIA				*246	1,220	Cassel	0.25	385	779	Katowice	2.0				
*244	1,220	Linz	0.5	253	1,184	Gleiwitz	2.0	*403	734	Katowice	10.0				
*283	1,058	Innsbruck	0.5	*259	1,157	Leipzig	2.5	1,411	212.5	Warsaw	8.0				
*352	851	Graz	7.0	270	1,113	Kaiserslautern	2.5	ROUMANIA							
*453	666	Klagenfurt	0.5	276	1,083	Königsberg	2.5	*594	561	Bucarest	12.0				
*517	581	Vienna	15.0	283	1,058	Magdeburg	0.5	RUSSIA							
BELGIUM				*283	1,058	Berlin (E.)	0.5	720	416.6	Moscow (PTT)	20.0				
206	1,460	Antwerp	0.2	*283	1,058	Stettin	0.5	824	364	Sverdlovsk	25.0				
244.7	1,226	Ghent	0.25	*315.3	951	Bremen	0.35	938	320	Moscow-Stchekovo	100				
250.9	1,197	Schaerbeek	0.25	*320	937.6	Dresden	0.25	(C.C.S.P.)							
338	887	Forest	8.0	325	923	Breslau	1.5	1,000	300	Leningrad	20.0				
*509	590	Brussels	1.0	360	833	Stuttgart	1.5	1,000	283	Tiflis	10.0				
CZECHO-SLOVAKIA				*372	806	Hamburg	1.5	1,103	272	Moscow Popoff	40.0				
*263	1,139	Moravska-Ostrava	10.0	*390	770	Frankfurt	1.5	*1,301	230	Kharlov	25.0				
*279	1,076	Bratislava	12.5	*418	716	Berlin	1.5	1,380	215	Bakou	10.0				
*293	1,022	Kosice	2.0	*453	662	Danzig	0.25	1,481	202.5	Moscow (Kom)	40.0				
*342	878	Brunn (Brno)	2.4	*456	657	Aachen	0.35	SPAIN							
*437	617	Prague (Praha)	5.0	*473	675	Langenberg	15.0	550	1,202	Almeria	0.5				
DENMARK				*533	563	Munich	1.5	*616.5	1,125	Barcelona	10.0				
*231	1,067	Copenhagen	0.75	500	536	Augsburg	0.25	(E.AJ13)							
1,153	260	Kalundborg	7.5	*560	536	Hanover	0.35	*343	860	Barcelona	8.0				
ESTHONIA				569	527	Freiburg	0.35	363	815	Seville (E.AJ5)	1.5				
*296	1,013	Reval (Tallina)	1.5	*1,635	183.5	Zeesen	37.0	424	707	Madrid (E.AJ7)	2.0				
FINLAND				1,649	182	Norddeich	10.0	462	649	San Sebastian	0.5				
*221	1,355	Helsinki	10.0	HOLLAND				SWEDEN							
*1,796	167	Lahti	50.0	31.28	9,590	Eindhoven	30.0	231	1,301	Malmö	0.5				
FRANCE				(PCJ) 30.0				*298	1,004	Hilversum (until 6.0 p.m. B.S.T.)	0.5				
29.70	10,180	Radio Experimental (Paris)	1.4	*1,071	280	Hilversum	0.5	299	1,003	Falun	0.5				
175	1,714	St. Quentin	0.1	*1,071	280	Scheveningen	0.5	*322	932	Göteborg	10.5				
210	1,410	Radio Savoie	0.3	(from 11.10 a.m. to 6.0 p.m. B.S.T.)				*436	689	Stockholm (tests)	60.0				
212	1,415	Beziers	0.1	*1,875	160	Huizen	0.5	*542	554	Sundsvall	0.6				
212.8	1,410	Fécamp (Radio Normandie)	0.5	HUNGARY				1,700	380	Ostersund	0.6				
235	1,274	Bordeaux (Radio Sud-Ouest)	1.0	210	1,430	Budapest (Csepel)	10.0	1,200	250	Boden	0.6				
240	1,250	Nimes	0.25	550	545	Budapest	20.0	*1,348	222.5	Motala	30.0				
249	1,204	Juan-les-Pins	0.5	ICELAND				SWITZERLAND							
256	1,171	Toulouse (PTT)	1.5	*1,200	250	Reykjavik	16.0	*403	743	Berne	1.0				
265	1,132.2	Lille (PTT)	0.7	(under construction)				*459	653	Zurich	0.63				
GERMANY				IRISH FREE STATE				660	454.6	Lausanne	0.6				
268	1,121	Strasbourg	0.5	*225	1,337	Cork (IFS)	1.0	760	395	Geneva	0.25				
*272	1,102	Rennes (PTI)	0.5	*413	725	Dublin (2RN)	1.0	1,019	297	Basle	0.25				
286	1,040	Radio Lyons	0.5	ITALY				TURKEY							
*287	1,046	Montpellier	0.3	291	1,030	Turin (Torino)	7.0	*1,200	550	Istanbul	5.0				
293	1,022	Limoges (PTT)	0.5	*332	905	Naples (Napoli)	1.5	1,961	153	Ankara	7.0				
*04	956	Bordeaux (PTI)	1.0	385	779	Genoa (Genova)	1.0	YUGOSLAVIA							
308	973	Radio Vitus	1.0	*441	680	Rome (Roma)	50.0	306.7	978	Zagreb (Agram)	0.7				
*310	950	Marseilles (PTT)	0.5	453	662	Bolzano (IBZ)	0.3	431	695	Belgrade	2.5				
329	914	Poste Parisien	0.5	*501	599	Milan (Milano)	7.0	574.7	522	Ljubljana	2.5				
322	905	Grenoble (PTT)	0.3												
370	810	Radio LL (Paris)	0.5												
*381	788	Radio Toulouze	8.0												
447	671	Paris (Etat)	3.0												
466	644	Lyons (PTT)	5.0												
1,446	207	Eiffel Tower	12.0												
*1,725	174	Radio Paris	16.0												

All wavelengths marked with an asterisk have been allotted according to the Plan de Prague.

MORE RADIOGRAMS

The youngest regular radio announcer in the United States is claimed by WJSV, Mount Vernon Hills, Virginia. He is Paul Keough, aged 19.

The Federal Radio Commission has been approached by the State of Wisconsin for the allotment of more radio channels to broadcasting stations in the State.

St. Paul, Minn., is one of the latest cities in the United States to receive the permission of the Federal Radio Commission to create a crime-detection radio service. A transmitter to operate on 2,416 kilocycles and 500 watts will be used.

When a Troon (Ayrshire) innkeeper applied for permission to instal a wireless loud-speaker in the public bar, the police objected to having the blare of a loud-speaker in the bar, where customers of all classes might be assembled, and some might be wanting to talk and would resent the necessity of having to shout to drown the sound of the loud-speaker. They saw less objection to wireless in a sitting-room, and it was agreed to allow a loud-speaker to be installed in such an apartment.

Czecho-slovak listeners increased from 236,052 in 1928 to 260,000 in December, 1929. Austria, which has less than half its population, has 100,000 more listeners than Czecho-slovakia.

H. & B.

MERRY-MAKER PORTABLE

KIT

	s.	d.
1 Variable condenser (Burton or Polar) ...	12	6
1 Reaction condenser (Formo) ...	2	9
1 Filament switch (Pioneer) ...	1	3
3 Valve holders (Lotus) ...	3	9
1 .0002 Fixed condenser (T.C.C.) ...	1	9
1 .0001 Fixed condenser ...	1	3
2 Spade terminals (Belling-Lee) ...	1	9
6 Wander Plugs, marked (Belling-Lee) ...	1	9
1 4-pole balanced armature speaker unit	12	6
Piece of Six-Sixty cone paper ...	1	9
Grid-bias clip ...	1	6
1 H.F. choke (Lewcos) ...	7	9
2 L.F. transformers, 6 to 1 and 3 to 1 (Igranite) ...	1	15 0
1 100,000 fixed resistance (Graham-Farish) ...	2	3
1 3-meg. grid leak (Lissen) ...	1	0
1 Fixed potentiometer (Lewcos) ...	4	9
1 pair panel brackets (H. & B.) ...	1	3
Glazite ...	1	0

Cash Price £4 13 6

- 2 Ever-Ready 63-volt high-tension batteries, 17/- extra.
- 1 C.A.V. 2-volt 2 A.N.7, 17/-.
- 3 valves (Mullard, Mazda), 33/6.

The H. & B. Hand-polished Oak Cabinet, complete with Frame Aerial Fittings and Baseboard. All joints dovetailed; special lid, with clip fasteners. THE ONLY MERRY-MAKER PORTABLE CABINET OFFERED WITH A BUILT-IN TURNTABLE. CASH PRICE, 35/-

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Gerrard 2834. LONDON, W.1

RAW A.C. FOR THE FILAMENT

FOR those who cannot afford to make a complete change-over from ordinary to mains-driven valves, it is quite practicable to lighten the load on the accumulator by driving the filament of the output or power valve direct from A.C. mains. A step-down transformer is required to reduce the A.C. voltage to that required by the valve. The valve filament terminals are connected directly across the secondary winding, which is preferably centre-tapped to earth. Safety fuses should be inserted between each main and the terminals of the primary winding. In certain cases the method can also successfully be applied to the H.F. valves of the set (but not detector) by using a potentiometer tapping to avoid hum. B. A. R.

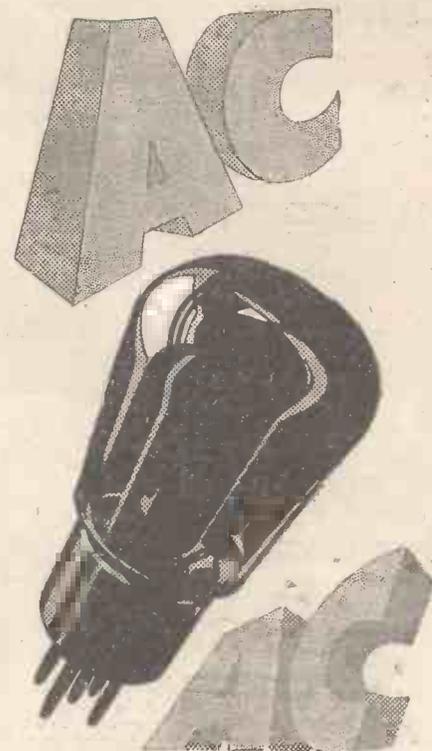
Listeners to the Rome station who have picked up the relays of operatic transmissions from the *Teatro Reale dell'Opera*, in the Italian capital, may be interested to learn that this theatre in the course of the season which has just terminated showed a loss of some £50,000, notwithstanding the subsidies granted to it by the civic authorities.

Work on the Cologne and Münster transmitters has been hurried forward and within the next few days these stations will work on a common wavelength of 227 metres. A similar alteration is to be made in the plant of the Aachen relay.

Notwithstanding announcements to the contrary made in Continental newspapers, it is definitely stated that the new French high-power transmitter now being erected between Brumath and Krautwiller, near Strasbourg, will not be completed before June next. It will work on 345 metres, with a power of some 12 to 15 kilowatts in the aerial. The plant has so been planned that should occasion arise the energy may be doubled.

The charge for a three-minute telephone call to the *Leviathan* for the first day of sailing from England is £4 10s., and each additional minute £1 10s., the rate rising as the distance from the shore increases.

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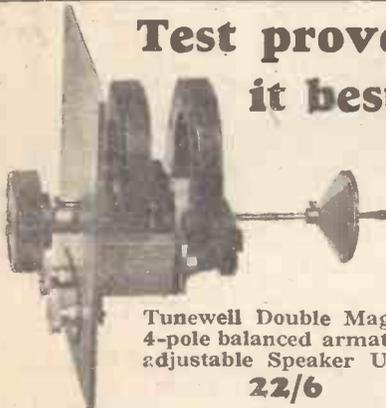
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"... the response is remarkably uniform from 300 to 6,000 cycles; below 300 there is a reduction, but there is a definite response down to 50 cycles. ... The general effect is very pleasing, and we have no hesitation in placing this unit in the highest class ... the sensitivity is above the average. ..."

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PLEASE write briefly

A Fee of One Shilling (postal order or postage stamps) must accompany each question and also a stamped addressed envelope and the coupon which will be found on the last page. Rough sketches and circuit diagrams can be provided for the usual query fee. Any drawings submitted should be sent on a separate sheet of paper. Wiring plans and layouts cannot be supplied.

Queries cannot be answered personally or by telephone.

Brookman's By-Pass wave-trap coils, complete with fixing brackets, 3/3 each

Tunewell "Cut-Out," 10/6

New Dual Range coil for Reinartz circuits. X-tapped on both high and low waves. Super-selective, 10/6

Tunewell Transformer, Ratios 3 to 1 and 5 to 1. 12/6



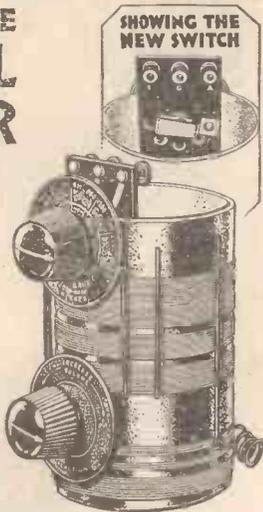
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"A REMARKABLE SELECTIVITY SYSTEM"

(Continued from page 617)

an extremely narrow frequency band. It is therefore necessary to use a super-heterodyne set for the purpose of converting the various signals tuned in to exactly the frequency of the "gate," but the officials of the corporation point out that the high selectivity of the Stenode Radiostat receiver is not in any way due to the "super." Its frame aerial can, in fact, be turned during the reception of a weak signal without varying the strength.

Now, if an ordinary receiver tunes too sharply the quality suffers, reproduction being "boomy" and without the correct high notes. But although the Stenode Radiostat receiver tunes much more sharply than any ordinary set, the quality appears to be satisfactory, there being good reproduction of the higher notes as well as the lower ones.

The following explanation has been given me by the corporation:—

"Sharpness of tuning or selectivity and the damping of a circuit are closely associated. For example, a circuit of high damping is generally very unselective, and as one reduces the damping, so the circuit becomes more selective.

"In a circuit which has extremely low damping low-note modulations which are, so to speak, in the circuit for a longer time than the high-note modulations (we are concerned here with the number of oscillations which go to make up a low- or a high-note modulation) build up to a much greater degree. Put more simply, in a circuit of very low damping into which are injected both high- and low-note received signals of the same intensity, the low notes will build up to a much larger degree than the high. We thus get bad effects from persistence, and without going into further detail it might be said that the effect of using a circuit of very low damping, such as the 'gate' circuit of the Stenode, is to produce the low notes disproportionately to the high. The distorting effect of this persistence is, therefore, corrected in the special amplifier part of the Stenode receiver."

The first valve of the set is an oscillator, whilst the second, a screen-grid, is used for rectification. Thus the incoming signals tuned by the frame circuit, and the locally generated oscillations, are applied to the second valve. Actually, the intermediate circuits are tuned to 107 kilocycles, and ordinary super-heterodyne action takes place until the last intermediate frequency stage is reached. This is the stage enclosed by broken lines in the diagram and follows the fifth valve.

Here a split variable condenser is used. The voltages across this circuit are impressed upon a quartz crystal having a special holder, but, owing to the capacity of the holder, a balancing circuit is used to leave the "quartz effect" alone. The

capacity of the quartz crystal holder is, by itself, sufficient to pass energy to the second detector, valve six, and it has therefore to be balanced out.

After passing through the quartz crystal circuit the signals reach the second detector, which is of the anode-bend type, a potentiometer being provided in the grid circuit to enable the best setting to be obtained. Owing to the very low damping of the quartz crystal circuit, the signal has a large continuous wave component and relatively little modulation.

From the detector the signals pass into the low-frequency amplifier, which contains a filter circuit designed to correct the overall characteristics of the set.

The apparatus demonstrated to us was well made, and evidently the signal tuned in is magnified greatly. Ample shielding was used, and meters provided in various circuits. Perhaps the most interesting to watch was that joined to the second detector.

To tune-in a station the frame tuning and the oscillator are adjusted with the

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quartz or "gate" circuit temporarily out of balance. Then the "gate" circuit is adjusted. Tuning is very sharp indeed, and searching as normally practised is out of the question, unless the apparatus is first put out of adjustment so that it passes a reasonably wide band of frequencies. Owing to the special low-frequency correcting circuit, the quality is very poor when the "gate" circuit is out of adjustment, but becomes quite good when the final tuning has been done.

The special parts of the circuit apparently have the effect of greatly reducing the signal strength. One would expect to obtain signals of enormous strength from a straight ten-valve super-heterodyne, but actually the signals are relatively of much less strength. A guess would be two valve stages less; but this is, of course, a very rough guess. The output from the second detector is of head telephone strength from a good signal and the low-frequency correcting circuit, as it magnifies the high notes much more than the low notes, does not greatly magnify the signal as a whole.

The results obtained were most interesting. A number of stations were tuned-in free from interference, although the stations were received with whistles as well when brought in on an ordinary set. This set, by the way, was a Columbia five-valve portable set, having three screen-grid stages.

It will be clear from the description that if the carrier of a transmitter varies in frequency it will affect the reception. In fact, if the carrier varies by more than a few cycles the reception will "fade." We listened to Rome, which appeared to be quite steady in its frequency. Brookmans Park stations varied a little, however, as indicated by the changes in the rectified current and in the volume. This appears to be a point of some importance.

One soon discovers how to handle the apparatus, but it is not yet in a commercial form. A good tone control was fitted and, as one would expect, the volume increased considerably when it was so adjusted that the relative strength of the lower notes was increased.

The demonstration was a success in that stations which, when brought in on the Columbia set were interfered with by others, working on so close a frequency that whistles were produced, were received quite clearly on the Stenode apparatus. Whether one agrees with the theory of the working, as explained by the officials of the corporation, or not, one must agree that the system works. It will probably not affect broadcast listeners for the time being, but may be applied to television, cable and land-line signalling. The corporation does not manufacture broadcast sets and no Stenode Radiostat receivers are on the market.

A TELEVISION PROBLEM

IN broadcasting sound, the rectified wave at the receiving end has alternate positive and negative values. In transmitting visual effects, on the other hand, the light intensity always has a positive value. It is therefore necessary to have a component of fixed amplitude or zero frequency. Otherwise there would be no difference in reception between a picture made up of alternate strips of black and grey and one made up of bands of grey and white. The difference between the two pictures lies wholly in the average value of light intensity.

Since variations in average picture density may occur slowly throughout the entire picture transmission, this sets a low limit to the total modulation range and so increases the total spread of the side bands. For television of good quality it has been estimated that a frequency band of 100 kilocycles is necessary as compared with 9 or 10 kilocycles for ordinary sound broadcasting.

B. A. R.

Owing to the increased demand for Tung-ram products in Italy, it has been found necessary to open a new factory at Milan. Particulars can be obtained from Tung-ram Electric Lamp Works (Gt. Britain), Ltd., Commerce House, 72 Oxford Street, London, W.1.

used in the "Wavelets Two" ...

the set described in this issue, is the TRIX SHORT WAVE H.F. Choke. For short wave sets, this splendid little choke is unequalled. It functions efficiently over a wave-band of 10-150 metres. The capacity is extremely low. Fully tested and guaranteed. Send for details of TRIX Standard H.F. Choke and other components.

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20 for 11^d¹/₂
50 for 2/5 100 for 4/8

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M.C.C. 325

LETTERS TO THE EDITOR



The Editor does not necessarily agree with the views expressed by correspondents.

Correspondence should be brief and to the point and written on one side of the paper.

The "Brookman's By-pass"
SIR,—I built the "Brookman's By-pass," described in your issue of February 1, but found it too severe. I added six more tappings to the coil, and as I then found it rather difficult to change to the different tappings I made a switch to do the changing. My switch consists of a number of brass drawing pins tacked to the side of the cabinet (inside) and connected each to a tapping. It is now easy to manipulate and I find it an excellent wavetrap.
P. M. M. (Dundalk).

5GB's Range
SIR,—I read with interest "Thermion's" note in AMATEUR WIRELESS No. 409 re the reduction in the effective range of 5GB owing to the re-arrangement of the aerial system. It may be of interest, therefore, to record that here in Exeter the reverse effect is noticeable, the Midland Regional station now coming in at far better strength than before and with a welcome absence of fading, which was the old 5GB's big fault previously. I can now get 5GB at comfortable loud-speaker strength on my S.G., D., P. set on a small indoor aerial, whereas previously only a faint whisper was audible, frequently

fading to extinction

Doubtless "Thermion" will say that "Reg" and "Nat" are of no concern to listeners in our district; at the same time, I would like heartily to endorse his plea for the abolition of the twin-regional scheme in its present high-power form, especially as there is a suggestion afoot that the Western Regional transmitters may be located near Exeter to serve Cornwall and Somerset, which would be rather outside the scope of the station if erected at Bristol or Cardiff, as is more generally expected. Heaven forbid! "Reg" and "Nat" at the distance they are from us are already the general nuisance on the broadcast band here. They are both utterly useless from a listening point of view, as they fade to extinction with great regularity about once a minute. In between these spasms of maidenly modesty, however, they lift up their voices and, having made the speaker shudder from stem to stern and bowed the output valve down with a nervous breakdown from overwork, they spread themselves out over the dial readings, blotting out respectively Algiers, Stuttgart, Graz, Barcelona, Moravska-Ostrava, Leipzig, and Hörby in a screaming whistle of heterodyne.

I must confess that, personally, I don't get this effect, as my set will successfully turn up its nose at either of the twins in about three-quarters of a degree either side; but my unfortunate friends with det. two L.F. sets on large aerials find the twins have a wipe-out of about 15 to 20 degrees each, many of them being unable to receive Toulouse, Brussels No. 2, or any other station anywhere within 40 kilocycles either side of the twins.

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