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Amateur Wireless

and Radiovision

Every Thursday 3d

Vol. XX. No. 501 Saturday, January 16, 1932

The "1932 ETHER SEARCHER"

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

1932 ETHER SEARCHER

PILOT AUTHOR'S KITS *Exact to Specification*

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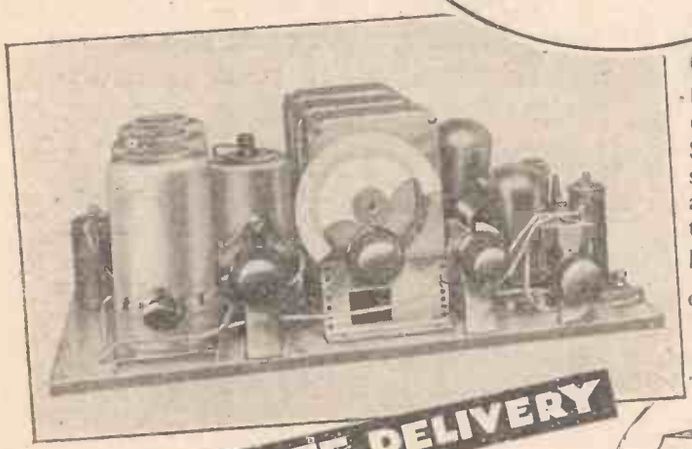

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Colvern type K, pair of KBLC and one KGR—three dual-range coils mounted and ganged	1	8	6
Peto-Scott Baseboard, 16 in. by 10 in.		1	3
Piece of aluminium foil, 15¾ in. by 9¾ in.		1	0
Junit, one five-pin valve holder			10
Junit, one four-pin valve holder			8
Telsen, one four-pin valve holder			6
Lissen, two .0002-mfd. fixed condensers		2	0
Dubilier, type 620, one .0002-mfd. fixed condenser		1	8
Dubilier, type 9200, three 1-mfd. fixed condensers		8	3
Dubilier, type 9200, 2-mfd. fixed condenser		3	6
Dubilier, type 9200, .05-mfd. fixed condenser, non-inductive		2	0
Lissen high-frequency choke (Disc Type)		2	0
Readi-Rad standard high-frequency choke		4	6
Lissen "Hypernia" low-frequency transformer		12	6
Formo "Midget" .0002-mfd. reaction-type variable condenser with knob		3	3
Readi-Rad .0003-mfd. reaction condenser		3	6
Wearite, type I.22, double-pole change-over switch with terminals, with indicating window "Radio-Off-Gramo."		4	0
Sovercign, type G, pre-set condenser, .0002-mfd. to .001-mfd.		1	6
Colvern valve screen		2	9
Lewcos, five spaghetti resistances, one 50,000 ohm, one 10,000 ohm, two 5,000 ohm, and one 1,000 ohm		5	3
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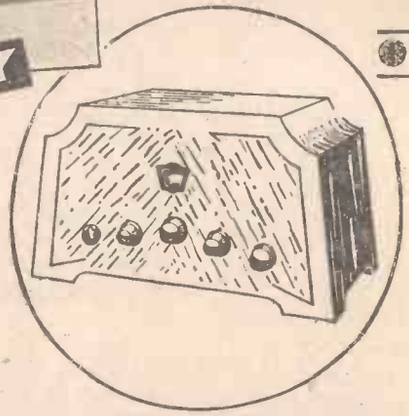
1932 ETHER SEARCHER CABINET—Specially designed at the request of "A.W." by Peto-Scott himself. In figured oak and ready drilled for escutcheon and panel controls. Price **16/-**



SEE PAGE 85 FOR 1932 RADIO ACCESSORIES

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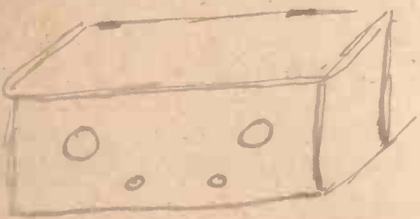

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No. 501. Vol. XX JANUARY 16, 1932

Amateur Wireless & Radiovision

BRITAIN'S LEADING RADIO WEEKLY FOR CONSTRUCTOR, LISTENER & EXPERIMENTER

EDITOR: BERNARD E. JONES. TECHNICAL EDITOR: J. H. REYNER, B.Sc., A.M.I.E.E. RESEARCH CONSULTANT: W. JAMES. ASSISTANT EDITOR: H. CORBISHLEY.

NEWS & GOSSIP OF THE WEEK

THE NEW SET

AS announced in last week's issue, your copy of AMATEUR WIRELESS this week contains first constructional details and a full-size wiring plan of a remarkable new set, the "1932 Ether Searcher." This is the type of outfit that does not call for glowing adjectives to boost it—it speaks for itself! Turn to pages 100 and 101 for an explanation.

FOR THE BLIND

THREE small children, the eldest of whom is only three and a half years old, and three pensioners whose ages total 217 years, are among the 16,500 who responded to Viscount Snowden's recent appeal for funds for the British "Wireless for the Blind" scheme. Readers will be pleased to know that over £4,500 has been raised and very shortly every blind person will be able to have a free wireless set.

TELEVISION—LATEST NEWS

WHILE it is now definite that the B.B.C. will, in the very near future, devote much more of its time to television broadcasts, we should like to correct the impression gaining ground that only the Baird process will be utilised. At the moment the Marconi engineers are experimenting with new television apparatus, and the B.B.C. proposes to give this a trial when it is ready—probably within the next few months.

MORE TELEVISION

MR. J. L. BAIRD has been in the United States for about two months and his return to England at the end of last month coincided with some encouraging news in connection with television. He has signed a five-year contract with the WMCA station, whereby once the licence to broadcast has been obtained, television programmes will be put "on the air" for several hours a day. Baird was called before the Federal Radio Commission in Washington in support of the application made by WMCA.

AT THE STATION

THIS station, one of the largest in New York, is owned by the Knickerbocker Broadcasting Company and the type of programme proposed is similar to that now being sent out by the B.B.C. There will be this difference, however, that longer time will be available and, furthermore, since this station has a sole concession for broadcasting Madison Square boxing matches it is hoped to conduct experiments in this line!

AN OPERA RELAY

SADLER'S Wells Theatre, the new "Old Vic for North London," which was opened about a year ago, will be the venue for a relay of the third act of *The Tales of Hoffman*, on January 30. This will be the first relay from the theatre. First tests made by the "O.B." engineers show that the place is very suitable for broadcasting, so we may expect some more Sadler's Wells relays.

THAT SATURDAY GAP

IN March the B.B.C. will fill the Saturday afternoon gap it promised to fill last October, but was prevented from filling owing to the economy wave that suddenly swamped Savoy Hill. There will be music from 12 to 1 p.m. and music will also fill the present gap from 2 to 3 or 3.30 p.m. Which is glad news!

WHAT ABOUT ECONOMY NOW?

IN view of the news that the Saturday afternoon gap in the B.B.C.'s programmes is to be filled, and that the American relays cancelled by the economy campaign are to be broadcast we are entitled to wonder where exactly the much talked-of B.B.C. economy really applies. The fact is, we think, that the B.B.C. has more than cut its losses to the Treasury, thanks to the record increase in licence revenue during 1931—more than 700,000 licences were added.

THE B.B.C. DANCE BAND

IT is significant to note that, at very short notice, Jack Payne has cancelled a show at a Birmingham music hall. It looks as though there have been rather too many appearances of the B.B.C. band at music halls recently; anyway, Jack Payne has had to engage substitute bands on several occasions recently, owing to outside engagements.

CONTROLLING A RADIO PLAY

A scene in the control room of the Birmingham Repertory Theatre. Mr. Percy Edgar, the Midland Regional Director is at the right, reading the play script

DETAILS OF THE MANY SPECIAL FEATURES OF NEXT WEEK'S ISSUE ARE GIVEN ON PAGE 89

NEWS & GOSSIP OF THE WEEK —*Continued*

DOCTOR BOULT

WE are glad to welcome Adrian Boult, the B.B.C.'s Music Chief, back from his holiday in Spain. By the way, he is to be known as "Doctor" Boult from now on. Another tempting offer has been made for his services from America—why does not the B.B.C. give the Doctor the financial recognition his services warrant?

AN AMATEUR SUCCESS

MR. H. O'HEFFERNAN, a popular radio amateur and the owner of the transmitting station G5BY, has added to his laurels by winning a certificate for accuracy in a recent contest run by an amateur association in America, the American Radio Relay League. G5BY did some useful work on a frequency meter and checked up wavelengths between 40 and 80 metres.

A SHORT-WAVE CLUB

WHILE on the topic of waves below 100 metres, readers will be interested to know that the International Short-Wave Club, which has headquarters at Klondyke, Ohio, U.S.A., is going strong. The Club is composed of thousands of short-wave "fans" from 62 countries. Short-wave listeners should get in touch with the British representative, Mr. A. E. Bear, at 10 St. Mary's Place, London, S.E.16.

GOOD LUCK, PHILIP!

AFTER his long series of broadcast shows Philip Ridgeway is off to tour the country in person—and for the next three months he will be touring with his show. He tells us that in the spring he has fixed up with the B.B.C. for a special "Parade" and then he will be off again. Admirers will wish Philip Ridgeway the best of luck in his latest venture.

MORE ABOUT RADIO PARIS

BULLETINS continue to arrive about the new high-power Radio Paris station which, at first, did not appear to be coming up to reputation. Parisian listeners have now been told that, after tests made, there are now 24,000,000 listeners who are getting good strength, whereas when the Clichy station was going there were only 8,000,000 getting the same average volume.

AN AMERICAN RELAY

AMERICAN listeners will have an opportunity of hearing the Ceremony of the Keys, which is to be relayed from the Tower of London on January 14. On this occasion the National Broadcasting Company of America will attempt to pick up and re-broadcast the ceremony for listeners in the United States.

WE KNOW!

WE have been rather amused at the B.B.C. engineers' recent attempts to minimise the snags encountered in the final construction of the studios at Broadcasting House. It has even been suggested that no snags have been encountered. Then what about the taking down of the gallery in the Vaudeville Studio, the cutting down of the balcony and the extension of the platform in the Concert Studio, the "lingering echo" in all the studios, and the noise of the underground trains running beneath the building—were all these snags or just part of the fun?

STUDIOS NOW O.K.

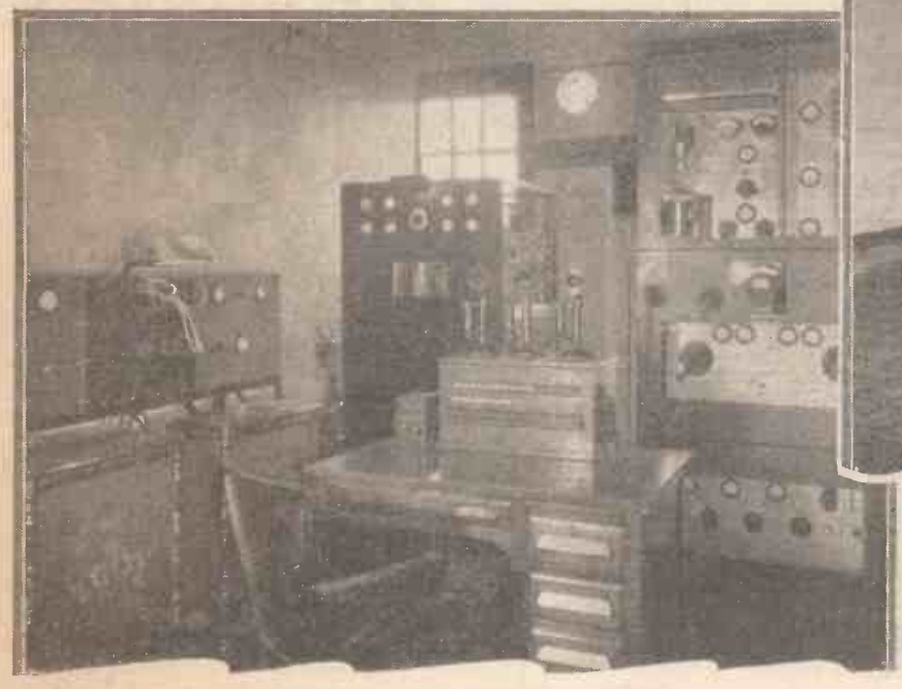
WE are glad to hear from the B.B.C. that most of the acoustical difficulties in the studios of Broadcasting House have now been overcome—all credit to Mr. A. B. Howe, the acoustical expert who has been working on the problem. It is a pity some of the engineers tried to make out there were no unforeseen troubles—rather belittling to the achievements of the experts.

A FREE FULL-SIZE WIRING PLAN

In this issue we have adopted a practical idea for giving a free full-size constructional chart and wiring plan of the "1932 Ether Searcher." Detach the sheets from the issue and use them as a template for panel drilling, for mounting the parts and for wiring. Any novice can make up the new "Ether Searcher" with the aid of this free print.

MIDLAND REGIONAL EXTENSIONS

AMONG the big extensions to the Broad Street building of the Midland Regional headquarters is a large concert studio and three smaller studios. When these are available the Midland station will be able more fairly to compete in programme interest with Manchester and Edinburgh.



Two views of the WMCA station from which television broadcasts will now be given on the Baird system, as described on the preceding page

MAKING YOUR TRANSPORTABLE MORE SELECTIVE

Self-contained frame-aerial sets which tune broadly are often difficult to improve in order to get better selectivity. Here are some helpful practical suggestions

"IT is stressed that it is better to turn a portable set so that its aerial is broadside on to the unwanted station, rather than make it point towards the wanted station," replied the B.B.C., when a friend of mine, owning a portable set, asked how to cut out stations.

He is only one of the many portable set listeners throughout the country who are finding that the directional effect of the average portable set aerial is so slight that the louder foreign stations come in as a background to B.B.C. local transmissions. When he first bought the set, ether congestion was not so bad. Until recently, when I helped him to carry out some improvements, he had intended scrapping the set and using an outdoor aerial, hoping by means of a band-pass tuner to get sharper tuning than with the frame aerial, paradoxical as this may appear.

Lack of Frame Selectivity

He found that turning the frame was not of much effect, largely because by the way stations are arranged in this country the best direction, from his home, for the London and Midland Regional transmitters was the same as that for two or three German stations.

Together we investigated and, after an evening's work, cured the trouble.

The frame was largely at fault. It was the conventional box type, with an entirely separate long-wave winding switched in series with the medium-wave section. The selectivity was poor because the long-wave turns were wound too close to the medium waves and this electrical damping resulted in what we used to call a "dead-end" effect.

We found that by making a 1-in. space between the windings, instead of the ¼-in. space provided, and adding a few turns to the long-wave section, the medium-wave performance was improved without affecting the wavelength range of the long-wave winding. 5XX and Radio Paris could still be tuned in.

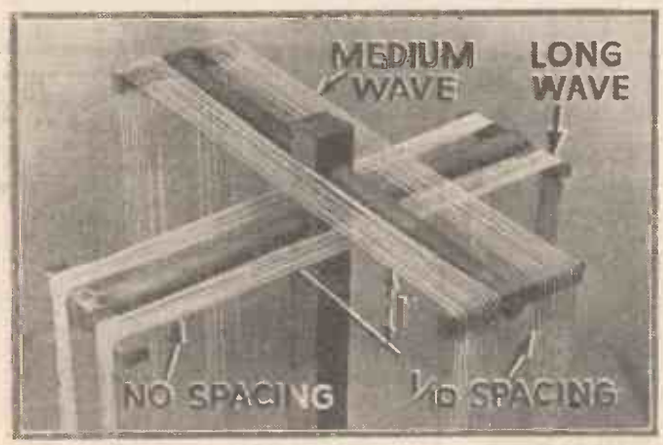
A mistake in this particular set was the placing of the reaction winding at the side of the medium-wave section, remote from the long-wave section. A few more turns were added to the long-wave winding and the reaction section was rewound between the medium- and long-wave turns. This made a great improvement. Easier reaction was obtained on both wavebands and the tuning seemed sharper.

Then we started operations on another frame aerial which the owner of the set had used in preference to the box frame built in the portable. Here the long- and medium-wave sections were at right angles, but the frame was very poor on the medium waves. This we traced to the fact that although the two sections of the frame were at right angles, they were almost touching. We rewound the inner frame on a smaller former to give a clear 1-in. space top and bottom, and the turns of the medium-wave winding were spaced $\frac{1}{10}$ in. apart. Stranded 27/40 wire was used for the medium-wave winding, to cut down the high-frequency resistance.

In both frames the leads to the reaction and medium- and long-wave windings were carefully spaced. Many frames have their tuning flattened by stray capacity set up at the ends of the windings, where the flex leads connect up to the set.

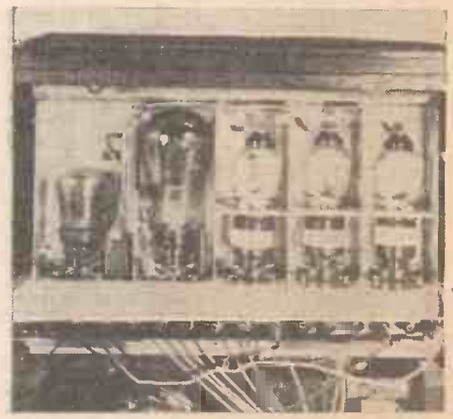
After these frame aerial modifications, we examined the set layout. It was fairly

(*Continued at foot of next page*)



Leading dimensions of a typical frame for a transportable set are shown here. It is essential to preserve the spacing between the medium-wave turns, and between the long- and medium-wave sections, in order to keep the frame selective

Undue self-capacity in a frame lowers its selectivity. For this reason the leads down to the set from the medium- and long-wave sections and the reaction winding should be kept well spaced and no faulty connections, causing high-resistance leaks, should exist



Where direct pick-up is causing lack of selectivity in a transportable, metal shielding for each stage may be resorted to

GETTING THE BEST FROM THE "BABY 3"

Constructors of this novel three-valver, particulars of which were given in last week's issue, will be interested in these operating instructions and hints and tips on getting the best reception

WHEN you have completed the wiring and checked over your "'Baby' 3," either with the full-size blueprint or the wiring diagram, then you can safely plug in the valves, connect up the batteries, aerial, earth, and speaker and see how the stations come in on the dial.

Provided that you have wound the coil correctly and connected it up as shown on the print, there should be no reason for not getting good results when first switching on. You must, of course, take the greatest care when following the wiring for the dual-range coil.

The Coil

It must be emphasised that the long-wave section of 400 turns (200 turns in each slot) is placed between the medium-wave winding on the outer former and the reaction winding on the same former. Thus, when you have wound the 90 turns of the medium-wave section, you connect through to the long-wave coil and then carry on with the 40 turns of the reaction winding. You will see that after having wound on 60 turns of the medium-wave section, a loop and twist are made at which the aerial wire from the pre-set condenser connects.

In this way the aerial is tapped two-thirds of the way down the coil. The wave change switch simply short-circuits the long-wave coil.

Many users of the "'Baby' 3" will be using existing valves and batteries, and whether this is so in your case, or whether you are buying new valves, be guided by the recommendations given in the accompanying panel. These show recommended valves of popular makes for all three stages.

Economical power valves have been specified, but if you have a large high-tension battery or a mains unit giving a generous output then you may find it an advantage to fit a larger power valve handling a greater grid-swing without overloading, and so getting a greater power output without distortion. With the valves specified an average high-tension value is 100 to 120 volts.

A medium-capacity high-tension battery will work the set, but the greatest economy in the long run is always obtained by using a battery the maximum discharge rate of which is well above the current drain of the set. The amount of high-tension current consumed by the "'Baby' 3" varies according to the valves used, but an average figure is 10 milliamperes.

There is only one high-tension tapping as the voltage for the detector is cut down by the 50,000-ohm resistance of the R.C. coupler. A slight drop in voltage for the anode of the first L.F. valve is occasioned by the primary of the L.F. transformer, the D.C. resistance resulting in a slight drop. The full high-tension voltage less the drop across the speaker windings is applied to the power valve anode.

A 9-volt grid-bias battery will be suitable. The G.B.1 lead should be taken to 1½-volts negative on the battery and the G.B.2 lead should be taken to 7½ or the full 9 volts, according to the type of power valve. Follow the advice given on the valve manufacturer's slip in the power-valve box.

Tuning the "'Baby' 3" is quite a straightforward job. There should be no need for reaction on the local stations and even on the louder foreigners the set should be kept well off the oscillation point. As there is no H.F. stage in the "'Baby 3" the set can cause interference if it is used in a state of oscillation.

For normal working the knob of the pre-set condenser (the small condenser fixed to the back of the plywood panel) should be screwed in nearly to the full extent. As it is rotated in an anti-clockwise direction, the selectivity will increase, but there will, of course, be a drop in signal strength.

RECOMMENDED VALVES

	Det.	1st L.F.	Power
Mullard	PM2DX	PM1LF	PM2A
Marconi	HL210	L210	P215
Osram	HL210	L210	P215
Cossor	210HF	210LF	215P
Six-Sixty	210HF	210LF	220P
Mazda	HL210	L210	P220
Eta	BY2023	BY2010	BW1304
Fotos	BC18	BC9	BD9
Dario	HF	Univ.	SP

You must find the most suitable setting for your reception conditions and locality. It is not critical, but you may find it necessary to retune after extensive adjustment of the pre-set condenser, for this may vary the tuning point.

When working on the medium waves, the greatest selectivity will be obtained when the wire from the pre-set condenser is taken from the tapping and not from the top end of the coil. On the long waves not much difference in selectivity will be noticed, but this will depend on the aerial used.

A PICK-UP REST

Don't overlook small points when building your own gramo-radio outfit. An important detail is a rest for the pick-up

arm, as in the H.M.V. instrument shown. If a rest is not provided, there is a possibility of the needle armature being damaged by dropping on the turntable top.

"MAKING YOUR TRANSPORTABLE MORE SELECTIVE"

(*Continued from preceding page*)

clear that the single high-frequency coupling transformer was picking up interference direct. It was remarkable that the set was stable, for there must have been interaction between the H.F. coupler and the frame. As some thin scrap metal from an old screened set was at hand, we made a rectangular shield to fit over the H.F. valve and coil.

The box was connected to negative low tension. This prevented any instability, but it slightly affected the tuning range.

When the set was reganged it was found that the tuning was sharpened to a surprising degree. K. U.

ONE-HOLE FIXING NUTS

Make a good job of tightening up one-hole fixing nuts because if they

work loose and a part rotates on the panel it may loosen the wiring and cause short circuits.

AT THE B.B.C.

PRODUCING VAUDEVILLE SHOWS

Our Special Commissioner explains some of the difficulties in choosing and rehearsing artistes for vaudeville hours

MOST listeners know that a concerted vaudeville show needs a producer. Rose, Gielgud, Hulbert, and others are among those who produce B.B.C. plays and vaudeville sketches.

Some shows demand an additional director, corresponding really to the stage manager of a theatre production, and as the technique of vaudeville turns broadens, so it becomes more difficult for the producer alone to run the whole show.

This is particularly the case with song-and-dance productions where singers, dancers, the orchestra and effects from another studio have to be marshalled together, without a break in the programme.

Using Noise Effects

Where there are plenty of noise "effects," then the producer does not come into the studio at all, but sits in the dramatic control room and hears the production on phones, turning the various potentiometer knobs which fade in the singers, dancers, or effects, according to the cue sheet. The stage manager directs the actual studio operations.

I have just been talking to a B.B.C. man who acts as stage manager for one series of vaudeville shows.

"As you know," he said, "in the music library the B.B.C. has dozens of gramophone records of noises, stray snatches of music, and effects of every kind, so that it is unnecessary to do anything in the studio but the straight singing. Even the tapping of the dancing could be 'faked.'

"Too much of this spoils the realism, and in the shows for which I act as 'stage manager,' a member of the effects department comes up into the studio with chains to rattle or dishes to smash and makes the noises on the spot!"

In the corner of the studio, generally studio Number Four, above the North entrance at Savoy Hill, is a listening cabinet where one of the engineers sits while the show is on and signals where the artistes must stand. The orchestra sits at the far end of the studio about 30 ft. from the microphone, and the conductor stands on a dais half-way down the room, so that he can hear the singer and the orchestra.

Unheard Singers!

Many people sing so softly and so close to the microphone that they cannot be heard above the music in the studio. One of the conductor's jobs is therefore to lead the orchestra in accompaniment to a singer who cannot be heard!

At the microphone during a broadcast revue. Some very popular artistes are taking part (left to right), Harry S. Pepper, Doris Arnold, Robert Hale, Mimi Crawford, William Stephens, Enid Stamp-Taylor, Anona Winn and Cyril Smith

Vaudeville producers at the dramatic control panel during a broadcast

Above the glass listening cabinet is a green light or "flick." This is switched on from another studio where the gramophone can be brought into action for giving additional effects. Registration between the studio programme and the effects has to be very carefully worked out, and when the man in the listening cabinet sits back with a smile then the people in the studio know that everything is O.K.!

One of the most difficult things is to get a show started and into its proper swing. This is particularly the case when the announcer speaks from another studio and when only the flicking of the red indicator light on the wall tells the artistes that they must start.

Few Successful Auditions

Even with experienced broadcasters there is apt to be a moment's hesitation and lack of confidence which is the producer's or stage manager's job to overcome.

Of course, it is still hard to get enough vaudeville artistes. Roughly 2,000 potential vaudeville broadcasters were heard during the last twelve months and less than 1 per cent. reached the required standard.

The B.B.C. has to book nearly 900 vaudeville artistes each year and the demand is increasing; but as one can rely on only about 200 newcomers a year, it is obvious how much difficulty there is in providing new material for the old hands.

The Leeds Symphony Concert relay on January 23 will be heard by North Regional listeners from 7.30 to 9.35 p.m.

For some time Mr. E. R. Appleton's stories to "Joan and Betty" in the West Regional programmes have been taken from the travels of St. Paul. On January 24 Mr. Appleton will revive one of the most popular of his previous stories. The "Joan and Betty" stories have now been given for nearly two years on the second and fourth Sundays of each month.

THE B.B.C. TALKS CONTROVERSY

A correspondent gives some behind-the-scenes facts regarding the policy relating to broadcast talks, and explains the arrangement of the new-season talks programme

THERE are rumours going round now about changes in the B.B.C. talks policy. Listeners who dislike talks of any kind on the wireless, and those opposites who rely on this side of broadcasting for their serious edification, are both wondering what is going to happen.

The B.B.C. states that "rumours respecting changes in policy with regard to talks are without foundation. The range of programme material is kept as wide as is compatible with the particular and, in fact, unique circumstances of the service. Experiments are frequent and changes now made are of method and not of policy."

There was some years back, as you may remember, a big fight to induce the B.B.C. to handle controversial subjects. Since then political leaders of all parties have broadcast, and although the B.B.C. has been fair to all parties, the controversial nature of the subject has always been there. One rumour going round about the talks was that all controversy (which generally means all interest) should be cut out.

Criticism of novels is suspended at the moment, but there are indications that this feature will come back again to the programmes. Mr. Desmond MacCarthy and Miss Sackville-West have been allowed half-an-hour talks, instead of only twenty minutes, on books. They deal with old and new books, so that this is, in a way, equivalent to the suspended novel criticisms.

Professor J. B. S. Haldane, who is speaking in the symposium "Science and Civilisation," on Wednesday evenings. Sir Oliver Lodge and Mr. Hilaire Belloc will speak in the same series

Mr. James Agate and Mr. Francis Birrell, who deal with plays and films respectively, have often been accused of being too critical—at least by the producers criticised. The fact that both these popular broadcasters now appear monthly instead of fortnightly must not be taken as proof that the B.B.C. agrees with the film and theatre magnates. Both the critics speak for half an hour, instead of twenty minutes, as hitherto.

I understand that they have been asked to give less detailed criticism, but to deal with new releases and first nights in a more general way.

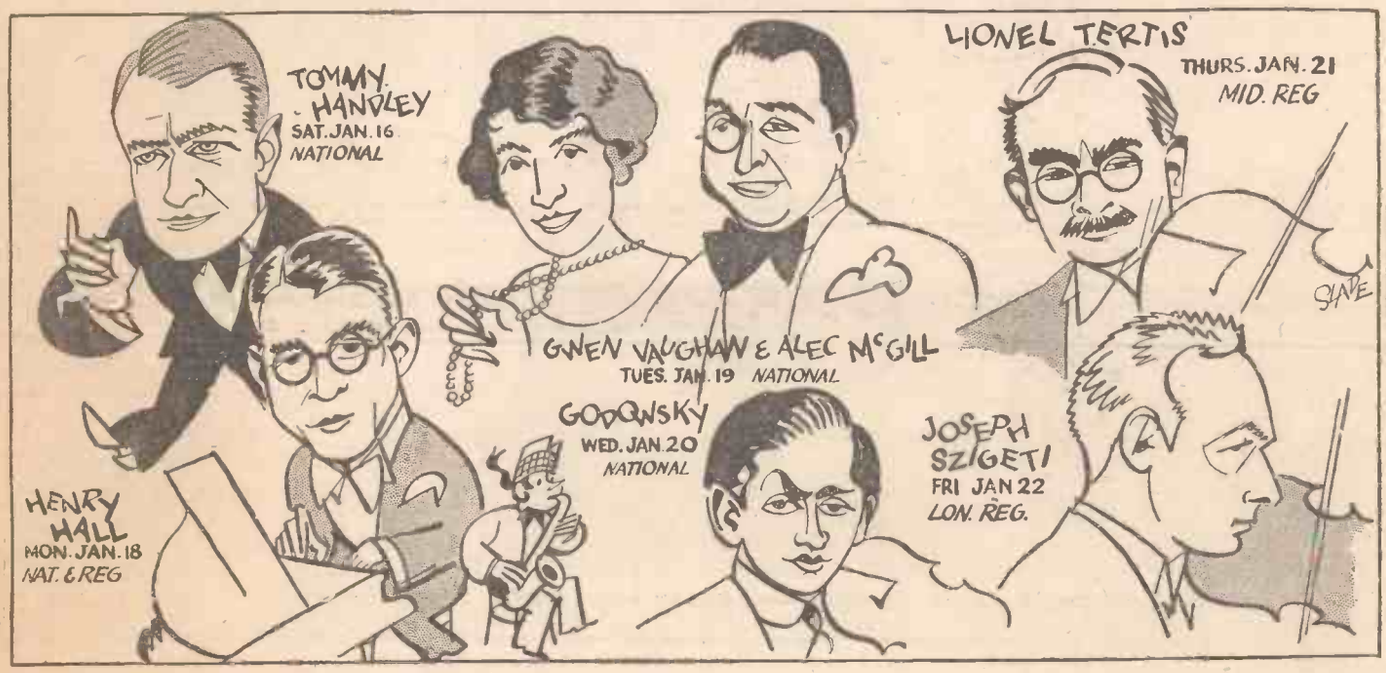
So far as other talks are concerned, special interests are provided for at particular times of day. A new experiment is being tried with the talks which have hitherto all been given from 10.45 to 11 a.m. The talks on cooking and children will be given at 1.45 p.m. on Mondays and Thursdays in order to ascertain whether this is an easier time for housewives.

On the other days of the week the talks will be at 10.45 a.m., as before. In response to requests from different parts of the country, the needs and interests of unemployed men and women have been kept closely in mind, and it is hoped that the various series of talks, particularly those on Tuesdays and Wednesdays, will be of practical use and interest to them as well as to the regular morning listeners.

At 6.50 and at 7.5 on four days of the week B.B.C. reviewers discuss a wide range of subjects, supplemented on Fridays by an important series of talks on the topical subject of currency, and on Saturdays by topical talks on sporting and other subjects.

On Saturdays there is an interesting experiment called "On the 9.20." This will be a series of conversations supposed to take place in a train. This form of conversation should make it possible for the talk to become thoroughly informal, like the conversation that may be heard in almost any railway carriage. Listeners will not know the names of the speakers, although many will be well known, until the broadcast is over.

PERSONALITIES IN THE WEEK'S PROGRAMMES



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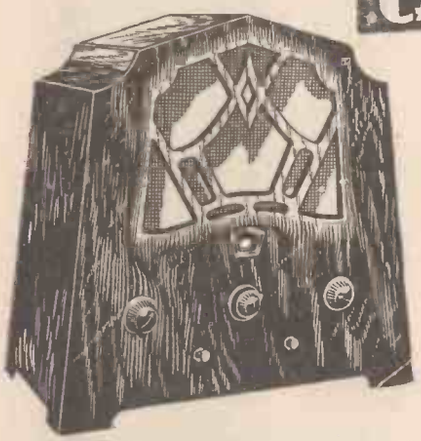

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1932 ETHER SEARCHER——SEE PAGE 73

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On Your Wavelength!

UP SHE GOES

EVER since it came into operation, Turin has been one of the big noises of Europe, though his output power has not exceeded 8.7 kilowatts, whilst the modulation has been of the order of 75 per cent. Now comes the news that Turin is going up to 10½ kilowatts and that his modulation will shortly become 100 per cent. Taking things all round, I suppose that the Italian stations are about as well heard in this country as any of the Europeans. Rome has always been a splendid and reliable transmission, Trieste frequently calls for the volume control, and Florence is strong and reliable on the wavelength that used to belong to Milan. Milan has now gone to 332 metres, where he, too, is well heard. The only country, I think, that can show a better record than Italy for reception in the British Isles is Germany. Amongst the Germans we hear Konigswusterhausen well on the long waves, and on the medium band there are no complaints about Langenberg, Frankfurt, Hamburg, Breslau, Heilsberg, Gleiwitz, Leipzig, and Nuremberg.

A WONDROUS FEAT

ONE doesn't like to say that anything in wireless is impossible, and all sorts of freaky things do happen from time to time. I must say, though, that my eyebrows went up in considerable astonishment the other day when I read in a lay paper a report that a writer of certain notes had spent the previous morning in running round the medium waveband and that in the course of his wireless trip abroad he had revelled in beautiful reception from Berlin Witzleben. Weeeel! I may, of course, be unfortunate, but I seldom find Witzleben more than a reasonably strong signal even after dark, and I really don't think that I could hear anything of him at all in daylight with the biggest set that I have—and that, by the way, is no small affair. I cannot help thinking that the gifted writer had stumbled on to Sottens, who is not so very far away from Witzleben on the tuning dials. As I say, though, almost anything may happen in wireless, and I should be glad to know whether any reader has succeeded in the last couple of months or so in hearing Witzleben in daylight.

WHAT YOU CAN HEAR

TALKING of daylight reception, conditions are little short of phenomenal on the medium waveband just now, and the number of stations that you can hear (provided, of course, that they are working!) from breakfast time onwards is something astonishing. Trieste is very often there at very useful strength and Leipzig has been an absolute wonder lately. A little higher up, Heilsberg is nearly always willing to oblige. Then comes Hilversum, and not far above him Gothenburg, Breslau, Brussels No. 2, and Strasbourg. Beromuenster, Rome, Stockholm, Langenberg, Prague, and Brussels No. 1 have all given me splendid daylight reception recently, and—wonder of wonders!—I was able to pull in Vienna at good loud-speaker strength on the morning of Christmas Day. You will find it well worth your while to take a turn round the medium band next time you have half an hour to spare during the daytime.

THE SHORT WAVES

FOR some unaccountable reason, the short waves have not been doing too well during the past week or two. There are odd nights or odd periods during which reception is pretty good, but, on the whole, it has been distinctly disappointing, in my locality at any rate. I do hope that we shall soon have a return to the conditions which prevailed in 1925-26, for then the short waves were simply miraculous. I was using in those days a three-valve S/W set, consisting of a detector and two note-magnifiers, and I used regularly to obtain loud-speaker reception of almost anything that was going. So reliable were stations then that whenever a friend dropped in for a smoke in the evening I had no hesitation in asking if he would like to hear the news bulletin from Schenectady or any other item that might be going from stations in different parts of the world. Those fine conditions will return, and it is to be hoped that they will do so this year and next, for there is sure to be tremendous interest in short-wave work owing to the erection of the B.B.C.'s new Empire station.

A STEP FORWARD

AS readers will remember, I have always pressed for the transmission of Empire news bulletins, for correspondents living in the far corners of the world have assured me, time and time again, that news from the Old Country is even more welcome than any amount of musical entertainment. You can imagine what it means to men whose latest newspaper is several weeks old to be able to flick over a switch, twiddle a knob or two, and receive red-hot news straight from London. Hitherto the wireless enthusiast living in an out-of-the-way spot has had to rely for his news mainly on American and Dutch transmissions, and naturally there is no particular British Empire coloration about it. This being so, it is good to know that from now onwards G5SW, the Chelmsford short-waver, is to send out special news bulletins three times a day. The hours of transmission are midnight, noon, and 6 p.m.; and they have been chosen so that reception of one, at any rate, of the bulletins should be possible in most parts of the Empire. The cost of these bulletins will not be more than £1,000 or £2,000 yearly, and they will be worth it over and over again.

WHEN PHONES PLAY UP

I HAVE just tracked down a mystifying trouble in a short-wave set to a rather unusual cause. I hadn't used it for some time, but it used to be a first-rate performer, with reaction control that literally was velvety smooth. As you tightened the reaction coupling the set used to glide almost imperceptibly into gentle oscillation; you had to listen hard to detect the coming of oscillation. Naturally, it was particularly good at bringing in broadcast programmes, for with a set of that kind you can work quite close up to the oscillation point and so put the set in its most sensitive condition without any risk of flopping. If a telephony carrier is heard, you can resolve it without any tuning to the silent point between squeals.

Now, when I brought this set into action again the other day it immediately misbehaved in the most shocking manner. Tightening the reaction coupling resulted in a threshold howl so appalling that one's ears literally rang for some little time after experiencing it. That the set was working up to a point was proved by the fact that carriers could be heard and that tuning to the silent point could be done. But you just couldn't obtain that desirable condition of affairs when the set is a little below the oscillation point, because either it was miles away from oscillation or it was oscillating to beat the band. Overlapping, too, was very bad, and this made matters even worse.

TRACKING IT DOWN

INSPECTION showed that the wiring of the set was in good order and the batteries gave a good account of themselves under test. Valves, then? Valve after valve was substituted for the detector, with equally poisonous results. Changing the note-magnifier (this is a two-valve set) did no good. What about the aerial and earth? The indoor aerial in use was re-wired and different earths were tried without result. Condensers, resistances, and even coils were substituted, one by one, for those in the set, but still the howl persisted. First one valve holder and then the other was changed; the L.F. transformer was tested and absolved from blame. As a last possible resource, the whole set was completely re-wired. Still it howled. Now then, what about it, reader? Not excluding the aerial and earth, every blessed component in the set was changed and every inch of wiring re-done. What's your solution, if any?

THE CAUSE OF THE TROUBLE

I CONFESS that I was completely baffled for some time, until it occurred to me that there was one thing, and just one, that I had not tested by substitution. Have you spotted

On Your Wavelength! (continued)

it yet? It was, of course, the headphones. They were a pair that had been in use for some little time and they had never previously given any trouble. They seemed to be in order when ordinary tests were applied to them, but the substitution of another pair showed that they were undoubtedly to blame, for with the second set of phones in use the set behaved as well as ever. I haven't yet had time to pull the old phones to pieces to see exactly what was wrong with them, but I do know that, having been once bitten in this way, I shall not forget to try changing the phones should similar trouble arise in another short-wave set.

WORTH REMEMBERING

BY the way, though there are few better methods of tracking down trouble than that of substituting valves and other components in a defective set, there is one very important point to bear in mind when you are conducting a search in this way for a fault that is difficult to locate. You *must* substitute only one component at a time. I have often seen people switch off the set and then change perhaps a couple of resistances, a valve, and a condenser before switching on again. If the set now works they haven't the slightest idea which of the components was responsible for this breakdown. The proper method, of course, is to switch off, to change one resistance, and try the set. If it still doesn't work, replace the old resistance, change the second, and test again. If it is still not working, replace the second resistance, change the condenser, and so on. Then if, after a particular substitution, the loud-speaker suddenly bursts into song you know exactly which of your components was to blame, and you can either consign it to the dustbin forthwith or preserve it for presentation to your worst enemy.

The same method should be employed when you are adjusting the set for selectivity or quality by varying the values of condensers, resistances, and so on. Let one thing at a time be your motto and you will know where you are.

CAR SETS

IN the U.S.A. the "automobile radio," which is American for car wireless set, is immensely popular, and I believe I am right in saying that several manufacturers fit receiving sets as a standard part of the equipment of their cars. The installing is made easy by the fact that 6-volt starting and lighting accumulators are used even on big cars over there, so that the whole battery can be brought into action for heating the filaments of 6-volt valves. High-tension is generally supplied by big dry batteries hidden away in a suitable box. In this country the car wireless set hasn't caught on to any great extent, and there are those who wonder why. I don't; do you? The plain and simple reason is that nobody particularly wants to instal a set for bringing in talks to schools and things of that kind, which seem to be the staple fare. We certainly ought to have brighter and better afternoon programmes, particularly from the Daventry National, during the summer time. If we had these I am sure that not only the car wireless set, but also the portable, would be much more widely used than they are now.

TOO TRUE

THE beginner must find it rather difficult to keep pace with some of the more technical terms used in up-to-date wireless. For instance, I heard recently of a man who went into a radio shop and demanded one of these "very new" valves. The assistant introduced him to a selection of the latest A.C. pentodes and what not, without success, and it was only after considerable cross-examination that he found out that what his customer really wanted was a "variable-mu" valve. Well, after all, "mu" is not exactly an every-day word, and I can quite understand how anyone who had only heard talk of it might easily go a bit astray. Of course, if he had read the recent issues of AMATEUR WIRELESS the customer would not only have escaped this little pitfall, but would probably know at least as much about it as the assistant who served him!

HIGH-FREQUENCY VALUES

JUST now more interest is being taken in high-frequency working than in any other side of wireless. There are umpteen short-wave programmes broadcast every day between 15 and 60 metres, to say nothing of the future prospects of "local" broadcasting on 7 metres or less. Still further in the offing, so to speak, one hears of experiments being carried out on wavelengths measured in centimetres, though these are hardly likely to concern the ordinary listener for a long while to come. One of the amazing features about ultra-short-wave working is the way in which such things as resistance, inductance, and capacity seem to lose their identity and get merged together. An electrical power engineer, for instance, never has to consider the capacity of an inductance coil or the inductance of a resistance. He knows exactly where he is in these matters.

BATTERY CONNECTIONS

It is much better to have proper wander plugs on the ends of battery leads rather than to plug these in the

sockets with match ends: See that there is a good contact between the wander-plug fixing and the wire.

A BIT MIXED

WHEN handling ultra-high frequencies the expert uses circuits "tuned" simply and solely by the inductance of two straight pieces of wire and the capacity across or between them. He calls it a Lecher circuit, but that is all it amounts to. Of course, even on the broadcast wavelengths we know that there can be quite a lot of undesirable capacity across even small bits of wire; for instance, the capacity coupling between the grid and filament and plate inside a valve. One must either use a screen-grid valve or a neutrodyne circuit to get rid of this spot of trouble, or else suffer the consequences. And the real short-wave merchant knows only too well that when it comes to using an inductance coil—unless the windings are very generously spaced apart—it is just as likely to act as a capacity and "short" the signals from top to bottom as it is to behave itself properly and in accordance with the older text-books.

RATHER INTERESTING

NOT long ago I wrote an article on the subject of earth connections, the theme of which was that thousands of people were obtaining indifferent results from their sets simply and solely because their earth connections were faulty. In it I recommended readers to spend the next fine afternoon in making investigations, pointing out that to be really good an outdoor earth must be planted well below the light upper soil, and if possible right down in clay. Many people seem to have taken my words of wisdom to heart, for I have since received scores of letters thanking me for having given this advice. Writer after writer says something like this: "My earth plate (or earth tube) was about 2½ ft. down. Last Saturday I dug down to it and found, as you suggested, that it was buried in gravelly (or chalky) soil. I made the hole deeper and came on clay. Now my wireless set is a different thing altogether." The improvement noticed concerns signal strength, range, selectivity, and very often quality (since less reaction is required). With mains sets a bad earth often leads to hum, and the improvement made by providing a first-rate earth is astonishing. If you are not satisfied with your results—particularly if a friend obtains far better reception with a similar set—suspect your earth and take a little healthy exercise with a spade. It is really worth while.

THERMION.

READ ABOUT OUR 2nd SPECIAL NUMBER PUBLISHED NEXT THURSDAY, JAN. 21st

We want you to be aware of what "Amateur Wireless" is doing next week in one of the most important issues that has yet been prepared. It will be a big issue, containing many practical and delightful features. We spare ourselves space on this page to mention just three of them, and it must be emphasised that every page of next week's number has been written and presented in such a way as best to please you and meet your definite needs.

THE EDITOR.

"THE 1932 ETHER SEARCHER"

We continue our explanation of the "THE BEST THREE YET," and complete the details of its extremely simple construction. Every builder of this set will welcome the CONSTRUCTOR'S PICTORIAL GUIDE, a drawing easy of understanding and making clear at a glance the whole arrangement of the set, thus considerably assisting the constructor in assembling his components.

* * *

A SCORE OF LOUD-SPEAKER HINTS AND TIPS

This is a FULLY ILLUSTRATED FEATURE of an extremely attractive nature—practical, interesting and suggestive. It has been written by various members of the staff with the sole idea of helping the reader to IMPROVE HIS LOUD-SPEAKER RESULTS. For this feature only next week's issue of "Amateur Wireless" will be worth your while and worth your threepence.

A SPECIAL 12-PAGE SUPPLEMENT

Our third feature is in the nature of a novelty. The idea, if not unique in itself, will be new to readers of "Amateur Wireless," and the manner in which it is carried out will, I think, compel their appreciation. We are including in the issue a 12-PAGE SUPPLEMENT which in itself is A COMPLETE GUIDE TO AMATEUR SHORT-WAVE RECEPTION — not a "talkie-talkie" effusion, but a serious although popularly written treatise in "A.W."'s own vein, showing the reader how to equip himself for SHORT-WAVE LISTENING and thereby very considerably extend both his pleasure and his interest.

There are surprises in this supplement. It contains, for one thing, THE MOST UP-TO-DATE AND TRUSTWORTHY LIST OF SHORT-WAVE TRANSMISSIONS that has yet been published. It will give you a number of SHORT-WAVE PRACTICALITIES in the form of hints and tips. It will show you how to make simple short-wave sets, and, in particular, will explain how to convert and adapt your existing ordinary set for short-wave listening. Mr. W. James contributes to this supplement the "JAMES' SHORT-WAVE SUPER," for which we know a very large audience is waiting.

* * *

A WORD TO THE WISE!

Such a number as this, advertised throughout the length and breadth of Great Britain, will simply go out of print in a few hours. Will you see to it, please, that your copy is ordered in advance?

THE HOW AND WHY OF TUNING—XVIII

MAKING AND USING A SIMPLE WAVETRAP

As our contributor "Hotspot" points out in this article in his series on the "How and Why of Tuning," there are still uses for a simple wavetrap in modern two- and three-valve sets

WHEN the aerial circuit is unselective the two regional stations are likely to interfere with each other, particularly in two- and three-valvers where the aerial tuning is the only tuning—when the first valve is the detector.

If the most that is demanded in selectivity is the ability of the tuning to separate the two regional stations, a wavetrap will serve very well. There is much to be said in favour of the wavetrap for such a simple selectivity requirement, but on the other hand there is a great deal of nonsense still talked of the miraculous powers of the wavetrap.

In general, it may be said that a wavetrap will not appreciably increase the overall selectivity of a tuning circuit, but it will confer a measure of special selectivity with respect to one particular station.

For listeners living very close to a regional broadcasting centre, and using simple sets for the reception of only the local alternative programmes, the usual advice is to decrease the strength of all incoming signals by the use of a series aerial condenser, and then with the aid of reaction increase the strength of the wanted station. Such advice can be carried too far, and then, due to the lowering of the resistance of the tuning coil by the excessive application of reaction, quality of reproduction suffers from mutilation of the high notes.

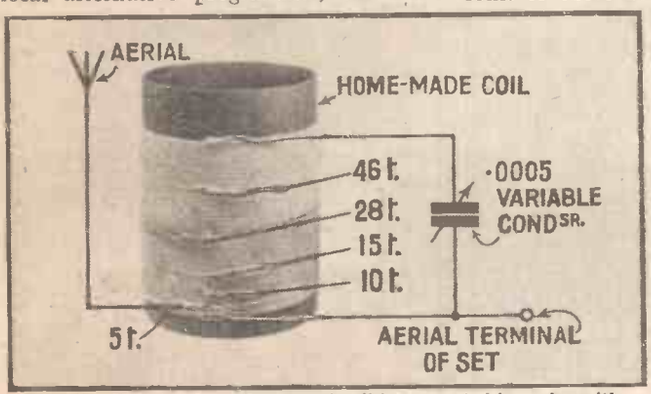


Fig. 3. Showing how the tapped coil is connected in series with the aerial and the aerial terminal of the set

A simple wavetrap will enable the unwanted signal to be cut down without so much loss of strength on the wanted signal, and consequently without so much application of reaction. The simplest form of wavetrap is shown by the circuit of Fig. 1. It consists of a coil and variable condenser in series with the aerial lead and the aerial terminal of the set. If this is tuned very accurately to the wavelength of the unwanted station it will offer a much greater impedance to the unwanted signal than to any other signal.

Unfortunately, it is not possible, under working conditions, to make the coil and condenser circuit in series with the aerial lead reject only the unwanted signal—it will reject signals on adjacent wavelengths as well. So if you were using an unselective set in, say, London, and a wavetrap were inserted in the aerial lead, it is most unlikely that you would then be able to receive clear of London Regional such stations as Mühlacker and Strasbourg, for these wavelength neighbours of the London station would be trapped with the London station—assuming, of course, that the trap were tuned to the London station's wavelength.

Trap Limitations

But the trap, if well made, would certainly enable Midland Regional to be heard clear of London Regional, and there would be no interference between the two London stations.

It is just as well to dispel any illusions about the powers of the wavetrap, since some of these devices are advertised in a way that is sheer exploitation. Subject to well-known limitations there is everything to recommend the wavetrap—but you must know those limitations or be greatly disappointed.

The Fig. 1A circuit is as effective as any other circuit for a wavetrap, but it has the disadvantage of upsetting all the tuning points on the dial of the set. A very good modification is shown by Fig. 1B, where the coil is tapped so that the trap circuit is auto-coupled to the aerial-tuning circuit, and has very little effect on the tuning of the set. The amount of the trap coil tapped into the aerial circuit will determine how much the set's tuning is affected.

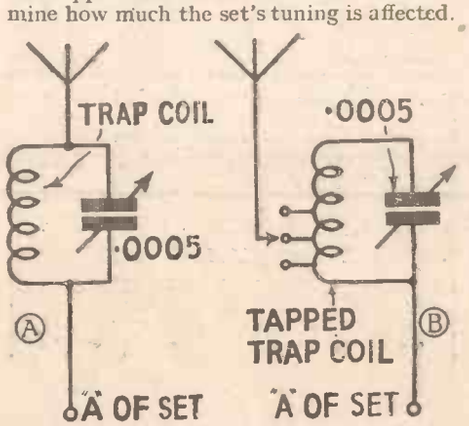


Fig. 1. At A is shown the simplest possible trap circuit, and at B a more suitable trap for modern conditions

For use, say, 15 miles from a regional station only a few turns need be included in the aerial circuit, say 5 to 10 turns. Then the tuning of the set will hardly be affected at all by the trap adjustment. Very close to a regional centre it is necessary to move the tap higher up the coil, including probably as much as half the coil of the wavetrap in the aerial circuit.

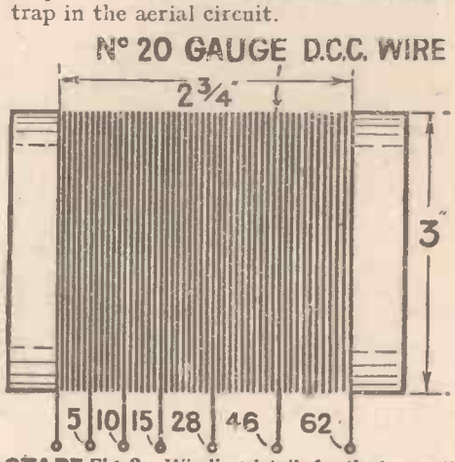


Fig. 2. Winding details for the trap coil

Fig. 2 gives all the necessary winding details for a wavetrap conforming to B.B.C. specifications. On a 3-inch diameter coil former wind 62 turns of No. 20 gauge double-cotton-covered wire, making taps at the 5th, 10th, 15th, 28th, and 46th turns from the start.

I wound such a coil on a paxolin former, and used just under a quarter of a pound reel of the wire. The taps I made by twisting the wire back on itself as the turn numbers reached the above-mentioned points. These taps were subsequently bared, and contact made with the required tap by means of a crocodile clip on the end of a piece of flex.

The coil should, if possible, be tuned by means of an air-spaced variable condenser, as it is important to keep down the losses if really sharp trap tuning is wanted. See pictorial diagram at Fig. 3.

Connected to a fairly unselective three-valve set, this trap worked extremely well, enabling Midland Regional to be heard quite clear of the London Regional's programme, and without any loss of signal strength. It was found that the best way to eliminate the unwanted station was first to tune to it on the set with the trap out of circuit and then, having switched in the trap, to tune the trap condenser very slowly until at one particular spot the unwanted station almost entirely disappeared.

For this test of the specified wavetrap I used the 5th-turn tap, and with this I found that the tuning of the set was in no way affected. Later I tried the effect of a

(*Continued on page* 96)

" In my opinion the H.M.V. three-valver is one of the most outstanding triumphs of the British radio industry."

WITH the above words " Set Tester" concludes the review in the December 26th issue of "Amateur Wireless" of a receiver that is already making 1932 radio history — the "His Master's Voice" Model 435 three-valve all-mains radio set with self-contained moving-coil loudspeaker.

ARE YOU CURIOUS?

Here are a few answers to questions you might ask about this wonder receiver—

QUESTION. *What is this Instrument?*
ANSWER. *A straight radio-set which can reproduce records electrically by connecting a pick-up or record player such as the "H.M.V." models 11, 116 or 117.*

QUESTION. *What valves are used in this set?*
ANSWER. *In the A.C. — MS4B; MH4; MPT4; U10. In the D.C. —DSB25; DH25; DPT25.*

QUESTION. *On what voltages will this instrument operate?*
ANSWER. *Separate models are made for A.C. or D.C. The A.C. voltage range is: —* 95-164. 190-260 *volts.* 50-100 *cycles. D.C. model—*190-250 *volts.*

QUESTION. *Are there any batteries used in the* 435?
ANSWER. *None at all; the instrument is completely mains operated.*

QUESTION. *Is this set easy to tune?*
ANSWER. *One dial tuning is employed and the scales calibrated in wave-lengths.*

QUESTION. *Does that mean there is more than one scale?*
ANSWER. *Yes; this instrument has an ingenious feature whereby the switch that changes the wavelength ranges automatically presents new scales reading as follows: " Medium Wave," " Long Wave," " Gramophone" and " Off."*

QUESTION. *Are the wavelengths easy to read?*
ANSWER. *Very: the pointer moves horizontally, and the dials are illuminated by concealed lighting.*

QUESTION. *Is it possible to control the volume of the output from the radio?*
ANSWER. *One volume control is conveniently situated on the front of the instrument and enables either radio or gramophone music to be regulated with a fine degree of accuracy.*

QUESTION. *How does the quality of reproduction from this set compare with other radio-receivers?*
ANSWER. *By reason of the special band-pass tuning circuits whereby distortion during tuning of radio signals is eliminated, extremely good reproduction is obtained.*

QUESTION. *Is it necessary to attach a loud-speaker to the set?*
ANSWER. *A permanent magnet moving coil loud-speaker is built in the cabinet of the instrument.*

QUESTION. *Is it possible to receive any signals without an aerial?*
ANSWER. *A mains aerial device is fitted to the A.C. instrument which enables the principal Continental stations to be received without the necessity of erecting an aerial. In the case of the D.C. model similar results may be obtained by a few feet of flex run round the picture rail.*

QUESTION. *Can this set be taken from room to room without difficulty?*
ANSWER. *As it is a self-contained unit there is no reason why the receiver should not be taken from one room to another as desired.*

QUESTION. *What is the arrangement of the valves in the* 435?
ANSWER. *There is a screened-grid high frequency stage, a detector valve employing power grid rectification which is coupled to a super-power pentode by a* 7 *to* 1 *transformer of special design.*

QUESTION. *What is the output of the receiver?*
ANSWER. 1½ *watts undistorted, which is ample volume for the average room.*

QUESTION. *What are the wave-lengths ranges of this set?*
ANSWER. 220-550 *metres;* 800-2200 *metres.*

QUESTION. *Can extra loud-speakers be operated by the* 435?
ANSWER. *Up to two moving coil loud-speakers of low resistance type may be connected to this receiver—for instance, the "H.M.V." models L.S.* 5 *or L.S.* 7.

QUESTION. *What type of cabinet is the radio-set housed in?*
ANSWER. *An arched walnut cabinet of pleasing design.*

QUESTION. *What is the price of the " His Master's Voice" Model* 435?
ANSWER. *Cash Price* 22 *guineas, or* 46/2 *down and* 12 *monthly payments of* 37/3.

THE FIRST WIRELESS SET TO QUALIFY FOR THE WORLD'S MOST FAMOUS TRADE MARK

His Master's Voice

The Gramophone Co. Ltd., London, W.1.

You Cannot Go Wrong If You Use A

FULL-SIZE BLUEPRINT

EACH BLUEPRINT SHOWS THE POSITION OF EVERY COMPONENT AND EVERY WIRE, AND MAKES CONSTRUCTION A SIMPLE MATTER.

WHEN ORDERING, PLEASE SEND A POSTAL ORDER, NOT STAMPS, TO BLUEPRINT DEPT., "AMATEUR WIRELESS," 58/61 FETTER LANE, LONDON, E.C.4 GIVING NAME OF SET AND NUMBER OF BLUEPRINT REQUIRED.

CRYSTAL SET

6d., post free.

1931 Crystal Set	AW308

ONE-VALVE SET

1s. post free.

Easy-to-build One	AW304

TWO-VALVE SETS

All these 1s. each, post free.

Hyper-selective Two (D, Pentode)	AW198
British Broadcast Two (D, Trans)	AW215
Wavelets Two (D, Trans)	AW229
No-battery A.C. Mains Two (D, Trans)	AW230
No-battery Gramo-radio 2 (D, Trans)	AW238
Arrow Two (D, Trans)	AW249
Forty-five-Shilling Two (D, Trans)	AW250
Challenge Two (D, Trans)	AW261
Twenty-Shilling Two (D, Trans)	AW274
Room-to-Room Two (D, Trans)	AW298
Big Volume 2 (D, Pen)	AW309
Two Star 2 (D, Pen)	AW315
A.B.C. 2 (D, Trans) with copy "W.M." 1s. 3d.	WM160
Brookman's Two (D, Trans)	WM168
Programme Two (D, Trans)	WM177
Gleaner Two (D, Trans)	WM201
Merlin Two (A.C. set)	WM213
Five-point Two (D, Trans)	WM220
Ever Tuned Regional Two (D, Trans)	WM241
Station Finder Two (D, Trans)	WM253
Music Lover's Two (D, Trans)	WM260
New Economy Two (D, Trans)	WM265

THREE-VALVE SETS

All these 1s. each, post free.

Brookman's By-pass Three (D, 2 Trans)	AW220
1930 Clarion Three (SG, D, Trans)	AW223
Auto Coupler Three (D, 2LF)	AW225
Car Three (D, RC, Trans)	AW244
The "A.W." Exhibition 3	AW247
"A.W." Challenge Kit Three (SG, D, Trans)	AW256
Push-pull D.C. Mains "Two" (D, Push-pull)	AW270
1931 Ether Searcher (SG, D, Trans)	AW271
1931 Ether Searcher (A.C. Model)	AW276
1931 Ether Searcher (D.C. Model)	AW284
Mains Unit	AW285
B.B.C. Selective Three (D, RC, Trans)	AW289
Square Peak Three (SG, D, Trans)	AW293
Universal Short-wave Three (SG, D, Trans)	AW301
Olympian Three (SG, D, Trans)	AW306
1931 Britain's Favourite Three (D, RC, Trans)	AW299
Universal Short-wave 3 (SG, D, Trans)	AW301
Olympian Three (SG, D, Trans)	AW306
Three Star 3 (SG, D, Pen)	AW313
Tonality Three (D, RC, RC.)	AW321
35/- Taree-Valver (D. 2RC.)	AW323
The Baby Three (D.RC. Trans)	AW324
Short Wave Link (D, RC, Trans)	WM142
Fanfare (D, 2 Trans)	WM157
Brookmans Three (SG, D, Trans)	WM161
Brookmans Push-pull Three (SG, D, Trans) 1/6	WM170
Celerity Three (SG, D, Trans)	WM173
All-nations Three (D, 2 Trans)	WM178
Inceptordyne (SG, D, Pentode)	WM179
Music Marshall (D, 2 Trans)	WM190
Gramo-Radio D.C. Three (SG, D, Trans)	WM196
Five-point Three (SG, D, Trans)	WM209
Falcon Three (A.C. Set)	WM217
New Brookman's Three (SG, D, Trans)	WM218
Five-point Short-waver (D, RC, Trans)	WM223
Plug-in-coil Three (D, 2 Trans)	WM232
Regional Three (SG, D, Trans)	WM236
Gramo Radio A.C. Three (SG, D, Trans)	WM237
Band-pass Inceptordyne (SG, D, Trans)	WM244
Ether Marshal (SG, D, Trans)	WM247
Meridian Short-waver (D, RC, Trans)	WM255
Five-advantage Three (D, RC, Trans)	WM257
Everybody's Radio-gram (SG, D, Trans)	WM258
Double Band-pass Three (SG, D, Trans)	WM259
Everybody's Radiogram (with Automatic Grid Bias)	WM262
New Economy Three (SG, D, Trans)	WM263

FOUR-VALVE SETS

All these 1s. 6d. each, post free.

Horizon Four (SG, D, 2 Trans)	AW237
The £3 3s. Four (SG, D, RC, Trans)	AW303
The £3 3s. Four (Improved Model)	AW303A
Everybody's Radio-gramophone (SG, D, RC, Trans)	AW310
Four Star 4 (SG, D, RC, Trans)	AW318
Drum Major (HF, D, RC, Trans)	WM137
Searcher's Four (SG, D, RC, Trans)	WM194
Regional Band-pass Four (SG, D, RC, Trans)	WM211
Five-point Four (SG, D, RC, Trans)	WM216
Regional A.C. Four (SG, D, RC, Trans)	WM222
Supertone Four (SG, D, Push-pull)	WM227
Ether Rover (SG, D, RC, Trans)	WM266

FIVE-VALVE SETS

1s. 6d. post free.

Britain's Super (Super-het)	AW311
A.C. Britain's Super (A.C. Super Het)	AW322
Mains Section (1)	AW322A

SIX-VALVE SETS

All these 1s. 6d. each, post free.

Century Super (Super-het)	AW287
A.C. Century Super (Super-het)	AW295
Mains Unit	AW295A
A.C. Super 60 Radio Gramophone (Super-het)	WM239
The Super 60 (Super-het)	WM229
A.C. Super 60 Table Model	WM245
Super 60 (with Wearite base)	WM249
Super 60 (with Lewcos base)	WM251
1932 Super 60 (Super-het)	WM269

SEVEN-VALVE SETS (1s. 6d. each)

Super Senior (Super-het)	WM256
Super Senior (with Lewcos Base and Wearite Coils)	WM261

PORTABLE SETS

Merry-maker Portable (D, 2 Trans)	AW228	1/-
Portable Century Super (Super-het)	AW297	1/6
Picnic Portable (D, RC, Trans)	WM148	1/-
Pedlar Portable Two (D, Trans)	WM195	1/-
Home and Garden Three (D, RC, Trans)	WM246	1/-

AMPLIFIERS

All these 1s. each, post free.

Beginner's Amplifier (1-v.) 9d.	AW210
Brookmans Separator (HF Unit)	AW212
Two-valve Amplifier	AW216
High Quality Amplifier for A.C. Mains	AW275
Add-on HF Screened-grid Unit	AW296
Universal Push-pull Amplifier	AW300
A.W. Record Player (LF, Push-pull)	AW319
Concentrator (HF Unit)	WM169
Selecto Amplifier (HF Unit)	WM210
D.C. Fader	WM242
Quality Amplifier (DC)	WM264

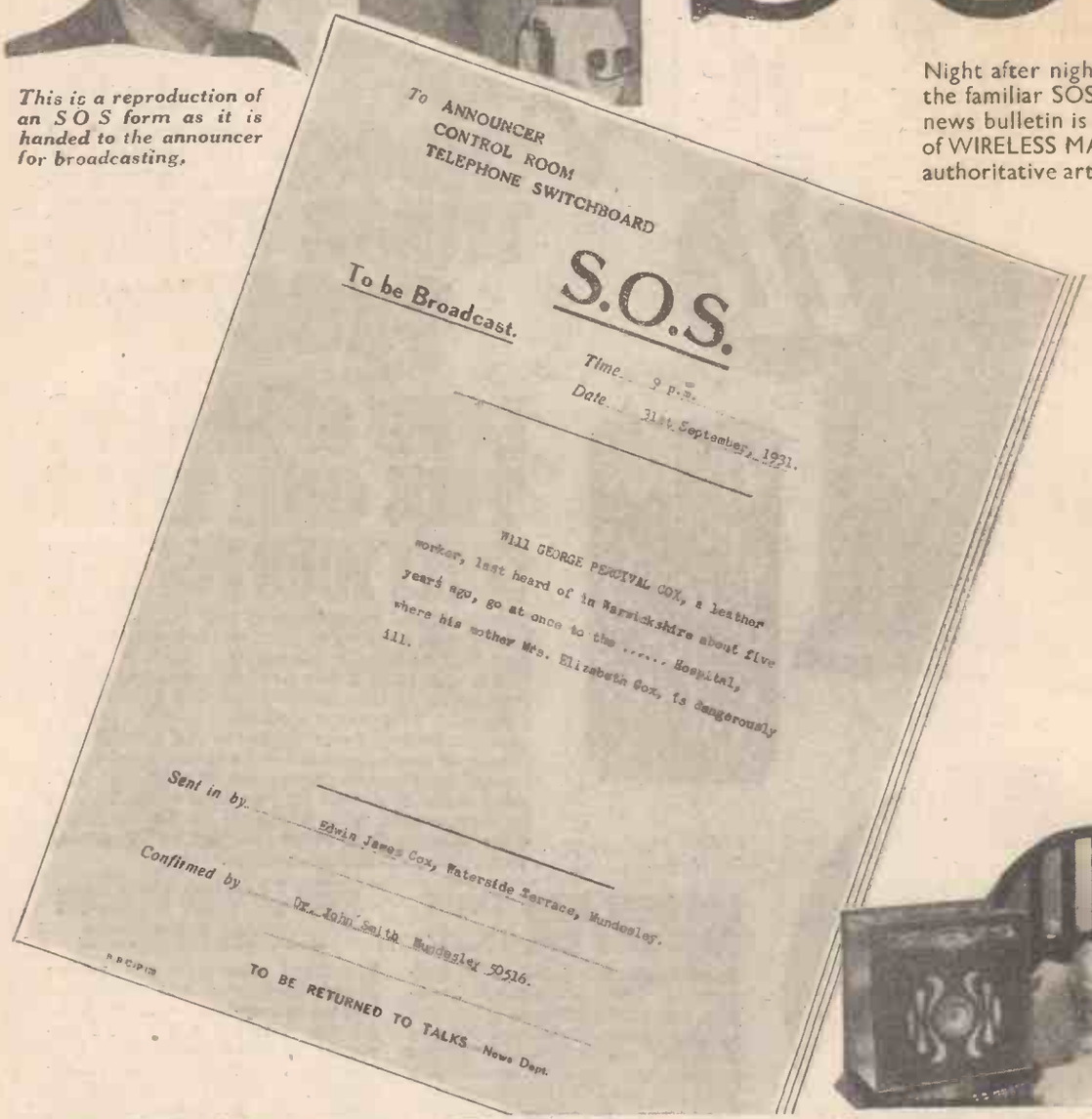
MISCELLANEOUS

"Twin" Brookmans By-pass	AW222	-/6
Simplest H.T. Eliminator for D.C. Mains	AW234	1/-
Choke Output Unit	AW240	1/-
Simple Tester Unit	AW246	-/6
"A.W." Improved Linen-diaphragm Speaker	AW248	1/-
Handy L.T. and G.B. Unit) for A.C. Mains	AW254	1/-
Ohmic Coupled DX Unit	AW255	1/-
Our H.T. Unit for A.C. Mains	AW262	1/-
Gramophone Tone Control	AW264	1/-
H.T. Unit and Trickle Charger for D.C. Mains	AW272	1/-
Booster Speaker	AW286	-/6
"A.W." Tone Changer	AW288	-/6
"A.W." Selectivity Unit	AW290	-/6
B.B.C. Official Selectivity Unit	AW294	-/6
A.C. Trickle Charger	AW305	1/-
Amateur's Linen Speaker	AW307	1/-
D.C. High-tension Unit	AW312	1/-
Converting a D.C. Unit to A.C.	AW314	1/-
Output Unit for Pentode Sets	AW316	1/-
"A.W." Short-wave Adaptor	AW317	1/-
"A.W." Record Player (L.F. Pushpull)	AW319	1/-
James H.T. Unit for D.C. Mains	WM133	1/-
Two-ampere Low-tension Unit	WM147	1/-
A.C. Mains Amplifier	WM149	1/-
A.C. Mains Unit for All-wave Lodestone Five	WM151	1/-
H.T. Unit for A.C. Mains	WM159	1/-
Short-wave adaptor for Overseas Five	WM192	1/-
Staminator Unit for A.C. Mains	WM202	1/-
"W.M." Standard A.C. Unit	WM214	1/-
"W.M." Standard D.C. Unit	WM215	1/-
Falcon A.C. Unit	WM219	1/-
Loud-speaker Tone Control	WM234	-/6
New Linen Diaphragm Loud-speaker	WM235	1/-
Super 60 A.C. Unit	WM248	1/-
Simple Neon Oscillator	WM250	1/-
Plug-in S.W. Adaptor	WM267	1/-
Super-het S.W. Adaptor	WM268	1/-

Copies of "Amateur Wireless" and of "Wireless Magazine" containing descriptions of most of these sets can be obtained at 4d. and 1s. 3d. respectively, post free. Index letters "A.W." refer to "Amateur Wireless" sets and "W.M." to "Wireless Magazine" sets.

SOS!

This is a reproduction of an S O S form as it is handed to the announcer for broadcasting.



To ANNOUNCER
CONTROL ROOM
TELEPHONE SWITCHBOARD

To be Broadcast.

S.O.S.

Time 9 p.m.
Date 31st. September, 1931.

Will GEORGE PERCIVAL COX, a leather worker, last heard of in Warwickshire about five years ago, go at once to the ..... Hospital, where his mother Mrs. Elizabeth Cox, is dangerously ill.

Sent in by Edwin James Cox, Waterside Terrace, Mundesley.

Confirmed by Dr. John Smith Mundesley 50516.

RECIPIENT TO BE RETURNED TO TALKS News Dept.

Night after night with unfailing regularity the familiar SOS appeal is made before the news bulletin is issued. In the January issue of WIRELESS MAGAZINE, now on sale, an authoritative article deals with the methods of handling SOS appeals at B.B.C. stations, together with full particulars of the methods of collecting world news for the bulletins. Get your copy to-day; don't miss this really exclusive feature.

WIRELESS MAGAZINE

OTHER SPLENDID ARTICLES IN THE JANUARY ISSUE

16-page "World-wide Reception" Supplement

Three More Sets for You to Build—
The New Economy Two (Costs only 65/-);
The Ether Rover, and the 1932 Super 60

The B.B.C. in 1931

British Television—
What is Being Done, by H. J. Barton Chapple
Future Possibilities, Alan Hunter

New Ideas in Tuning, by P. K. Turner, M.I.E.E.

Is Valve Progress on the Wrong Lines?

This "Featherweight" Question—Light Weighting for Pick-ups Discussed

ON SALE TO-DAY OF ALL BOOKSTALLS. PRICE 1/-

Have a 1932 Speaker for a 1932 Set!

22/6

A good Set deserves a good Speaker!

CHOOSE FROM THESE THREE LISSEN LOUD SPEAKERS THE ONE THAT SUITS YOUR POCKET

The *quality* of reproduction you can get from any set can only be as good as the loud-speaker you buy to handle its output. It is no good building a 1932 Ether Searcher and expecting it to give you true bass through a 1925 loud-speaker. The power and purity of the output you are getting deserves one of the new Lissen range of loud-speakers—the finest moderate-priced loud-speakers you can buy to-day. Ask your radio dealer to let you hear them . . . . . in comparison with anything he has in stock even at more than double the price! Your ear will choose Lissen every time.

15/-

LISSEN NEW TYPE CABINET SPEAKER

In solid oak cabinet, naturally hand-polished. Distinctively simple in design, beautifully finished. In tone this speaker compares with anything you have ever heard—bass deep but not predominant, upper register brilliant, voice soft and natural, volume anything from a whisper to a great degree of loudness according to your set. The greatest value in Cabinet Speakers ever offered. Price **22/6**

NEW LISSEN PLAQUE LOUDSPEAKER

For those who like the plaque design, here is a very handsome speaker to stand on a table or hang on the picture rail. It incorporates the new Lissen Cone Unit and gives fine full loud-speaker volume. With Metal Frame and two-colour spray finish. Price **13/6**

In Black Moulded Bakelite finished silver. Price **15/-**

13/6

LISSEN

1932 SPEAKERS

LISSEN LIMITED, Worple Road, Isleworth, Middlesex

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

GETTING RESULTS on the LONG WAVES

"Break through" is a common trouble in some sets when receiving on the long waves. It means that medium-wave stations interfere with long-wave reception at the bottom of the scale. Simple means of preventing this are described by J. H. REYNER, B.Sc., A.M.I.E.E.

ONE of the most prevalent troubles with the modern simple set is the break-through of medium-wave stations at the bottom of the long-wave scale. It is no uncommon thing to find the first thirty or forty degrees of the long-wave range completely useless for reception if a local transmitter is operating on some wavelength between 250 and 500 metres.

Such a state of affairs naturally seriously restricts the tuning range of the long-wave coil and may prevent several good foreign stations from being satisfactorily received. The severity of the disturbance depends to some extent upon the distance from the local transmitting station.

The trouble arises from a tuning action in the aerial circuit itself. It is not due to any defect in the long-wave coil itself, although certain types of winding tend to accentuate the trouble. The root of the matter, however, is to be found in the aerial circuit.

Couplings

Fig. 1 illustrates a typical coupled aerial circuit. We choose the coupling winding to give us the best average signal strength over the whole tuning range. There is a certain step-up action so that the voltage applied to the grid of the valve is more than that received on the aerial, by a considerable amount.

Leaving out of consideration any question of short-wave break-through, it is possible to decide the best number of turns on the coupling winding or the best tapping if one is using an auto-coupled arrangement. This usually corresponds to a tapping between one quarter and one third of the way up the coil. Such an arrangement gives the best general performance over the whole scale, and for the ordinary broadcast band of 250 to 500 metres, this is quite satisfactory.

When we come to the long-wave band, however, we strike this snag of break-through. If we have a tapping about one-third of the way up the coil, the inductance of the aerial winding will be of the order of 300 or 400 microhenries. This tunes with the aerial capacity, which is shown dotted in Fig. 1, to a wavelength within the 250 to 500 metre band. Owing to the fact that

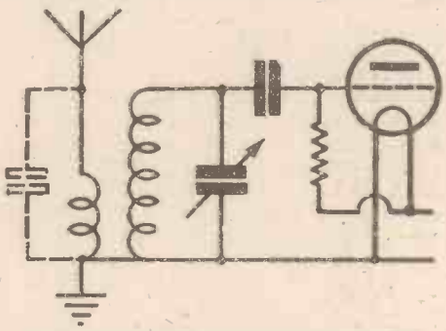


Fig. 1. A typical coupled aerial circuit in which a voltage step-up is obtained

the aerial has a relatively high resistance, the tune is somewhat broad, and if there is a powerful station operating anywhere within this band, a signal of considerable strength will be picked up.

The voltage so developed will be stepped-up by the transformer action giving us still more voltage across the secondary. Although the secondary circuit is not tuned to this interference the primary circuit is more or less tuned, and the result is the break-through which causes the trouble, and which may spread over quite an appreciable portion of the long-wave scale. Actually, the tune of the secondary influences the primary, so that as the tuning condenser is increased, the effect is minimised and the interference finally disappears.

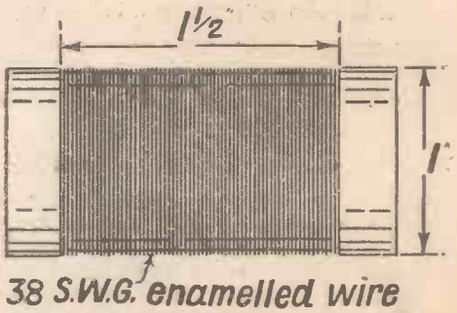


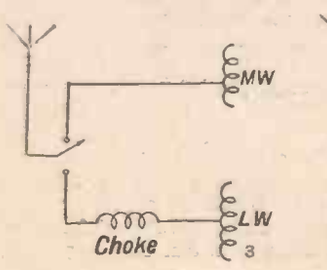
Fig. 2. Winding details of a simple choke which is effective in many cases in preventing "break through"

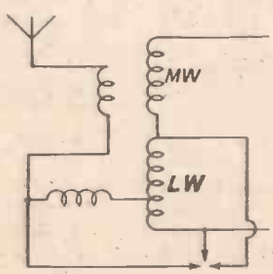
Stopping "Break-Through"

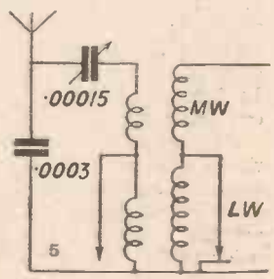
If we are using a coil which gives us this interference, therefore, the only remedy is to rearrange the aerial circuit in some manner such that it does not tune within the broadcast band, and is, therefore, not liable to be affected by the local transmitter. The simplest way of doing this is to increase the number of turns on the aerial winding, at the same time moving the coil rather farther away from the secondary so that the effective coupling between the primary and secondary will remain about the same.

If we want to transfer energy from one circuit to another we can do it either by having a few turns very close to the secon-

(*Continued on next page*)







Figs. 3 and 4. Two methods of using an additional choke coil. Fig. 5. Aerial connection through a variable condenser of .00015-microfarad maximum capacity

For the Newcomer to Wireless: SERIES AND PARALLEL

I AM always seeing the terms series and parallel used in wireless articles but I am not quite sure that I understand quite what they mean.

Well, really there is very much the same difference in one way as between a pair of horses and a tandem. Things connected in parallel are yoked side by side whilst those in series are arranged so that the head, so to speak, of the first is connected to the tail of the second. Let us take cells first of all.

How are they connected in parallel?

If we join the positive of one cell to the positive of the other and negative to negative then the two are in parallel. Suppose that we use two cells joined up in this way to heat the filament of a lamp the voltage will be the same as that of one cell alone, but the service life will be greatly increased since each cell is called upon to supply only half the current consumed. Is that clear?

Yes, and what about series?

Instead of connecting the cells as before we join the positive of the first to the negative of the second. This leaves one unoccupied terminal of each cell, the negative of the first and the positive of the second. The voltage of the two cells arranged in this way is exactly double that of one cell alone or of two cells in parallel. In wireless little use is made of parallel wiring for cells, but you see series wiring both in the accumulator and in the high-tension battery. In both cases we want a bigger E.M.F. than one cell can supply and we build it up by connecting the required number of cells in series.

Can't condensers be connected also in series or in parallel?

Yes. The principle is just the same. Here are two fixed condensers. I will mark the terminals of the first A and B in pencil and those of the second C and D. Supposing that we connect A to C and B to D the condensers are in parallel.

What is the result?

The total capacity produced by the arrangement is that of the first added to that of the second. Actually, each condenser has a capacity of .0003-microfarad. The total capacity now is .0006-microfarad.

How are they placed in series?

Simply by connecting terminal B to terminal C.

And the result?

The capacity between the unoccupied terminals A and D is now much less than that of either condenser alone. As a matter of fact, if the capacity of the two condensers is equal the total capacity of the two in series is just half that of either. With condensers, you see, series wiring reduces the capacity and parallel wiring increases it.

Does the same hold true of resistances?

No, exactly the opposite is the case. Wire two resistances in series and the total resistance is that of one plus that of the other. Put them in parallel and you effect a reduction.

You can wire a condenser in series or in parallel with a coil, can't you?

Certainly you can. In the majority of the tuned circuits that we use the two are in parallel, that is to say, one terminal of the condenser is wired to what we may call the top of the coil and the other to the bottom and the circuit is tuned by varying the capacity. Sometimes, though, in the aerial circuit we place the tuning condenser in series with the coil. In this case we connect the aerial to one terminal of the variable condenser and the top of the coil to its other terminal. The bottom of the coil goes to earth. Varying the capacity again tunes the coil, but we find that a much bigger coil is needed for a given waveband with the condenser in this position than when it is in parallel.

"GETTING GOOD RESULTS ON THE LONG WAVES"

(*Continued from preceding page*)

dary or by having a larger number of turns situated a greater distance away. In our case the second alternative is preferable because the larger number of turns necessarily means that the inductance of the aerial winding is increased and if we continue this to a point where the tune of the aerial circuit is outside the broadcast band, then the interference which we have just been discussing is obviated.

Lack of Selectivity

It should be noted that increasing the number of turns is not satisfactory by itself, because this would make the long-wave tuning very unselective. If the aerial turns are increased, the winding should be placed farther away in order to reduce the coupling to the same order as before.

If it is not practicable to increase the number of turns on the aerial winding in the manner just described, there are one or two alternative means which can be used. One other method of combating the trouble is to place an extra inductance in series with the aerial. This coil should have an inductance of 500 or 600 microhenries and may be a simple hank-wound or slot-wound coil. Fig. 2 gives details of a simple choke which is effective in many cases. This is easily wound upon a cardboard or paxolin former. It should be kept several inches away from the tuning coil.

A disadvantage of this method is that the choke must be switched out of circuit when going back to the broadcast band. Otherwise the signal strength on broadcast reception is appreciably reduced. This is because of the tune of the aerial circuit is thrown completely out of the broadcast band, which is what we want for long-wave reception, but is no good for reception on the broadcast band itself.

It is accepted to-day, however, that the same aerial winding must not be used on both wavebands, so that some form of switching is usually employed either to change over the aerial tapping altogether from the long- to the short-wave sections, or to short-circuit the long-wave section when receiving on the broadcast band. In either of these arrangements an extra choke coil may be incorporated as shown in Figs. 3 and 4, such that the choke is not in series on the short-wave band.

Commercial Practice

Another method used in the Telsen coil is to connect a condenser across the aerial and earth. This, of course, has the effect of altering the tune of the aerial circuit, and if the value of the condenser is correctly chosen it is found that the performance on the broadcast band is not seriously affected. In the case of the Telsen coil a .0003-condenser is used across the aerial and earth, but the aerial winding is connected through a variable condenser of .00015 capacity, as shown in Fig. 5, so that the effective shunting action of the aerial winding is somewhat reduced. This particular method is very effective under the conditions prevailing with the Telsen coil, and should be capable of application with a little experiment to other types of coil.

"MAKING AND USING A SIMPLE WAVETRAP"

(*Continued from page* 90)

pre-set type of variable condenser across the trap coil, but this did not work nearly so well, as the elimination point was not sharply defined. The local was certainly eliminated, but so were several stations on each side of it.

Leading Dimensions

For those who cannot obtain a 3-inch coil former it will be useful to detail the windings for other sizes. With a 2½-inch diameter former use 68 turns of 24-gauge wire, making taps at the 6th, 12th, 18th, 29th, and 47th turns. With a 3½-inch diameter former use 54 turns of No. 20 gauge wire, making taps at the 4th, 8th, 13th, 23rd, and 39th.

The wavelength of the coil shown by Fig. 2 is approximately from 125 to 604 metres, with a parallel .0005 variable condenser of fairly low minimum. The two alternative coils cover much the same band of wavelengths, and are therefore suitable for the elimination of any one of the B.B.C. stations.

I cannot recommend the use of two wavetraps to cut out two unwanted stations. This can be done, but the expense involved in doing it properly is more than the expense of re-designing the set's tuning, and not really so satisfactory.

But with one trap, such as that described, very unselective sets can be given a new lease of life. HOTSPOT.

Next week.—Selectivity with a simple Hartley tuning coil.

IN MY WIRELESS DEN

Weekly Hints — Constructional & Theoretical

By W. JAMES

Making Valves Howl

IN compact sets, in which the speaker is not far from the valves, there is always a chance that noises will be produced owing to sound waves or vibration reaching the valves.

The detector valve is usually the most troublesome. If it is slightly faulty, so slightly that nothing would be noticed in a set not built with the loud-speaker inside it, the chances are that noises will be heard.

Screen-grid valves, too, are likely to be troublesome, although most types are so strongly made that no trouble is ever experienced. If you should be bothered with noises or ringing, look to the screen-grid valve as well as the detector, for the fault may be traced to either stage.

I have pointed out on other occasions that with some tuning condensers the trouble is experienced. Designers are aware of this difficulty and now so secure the plates and arrange them that the chance of the trouble occurring is remote. Vibration of the plates has not been suspected in many cases until valves and other parts have been changed in an endeavour to trace the fault.

These Indoor Aerials

The remark is sometimes passed that a few feet of wire fastened to a picture rail is a better collector than a frame aerial. Tests show that this is not true.

A good frame aerial for the medium waves may be much better than a combination of a modern aerial coil, with its relatively high losses, and a short wire. Reaction may be applied to the aerial circuit and will help matters. But in many cases the reaction is applied to the detector circuit and between it and the aerial is a screen-grid stage.

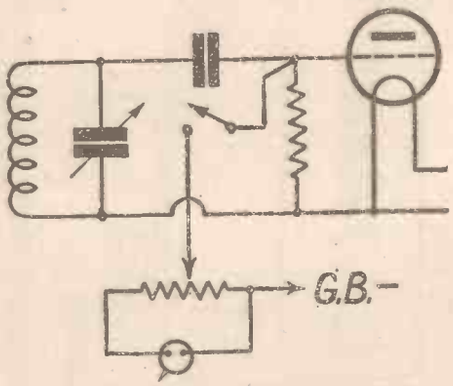
In super-heterodyne receivers, which do not have reaction applied to the aerial circuit, the effectiveness of the aerial circuit is of first importance. A good frame is usually found to be better than a poor indoor aerial and tuning coil. When a decent aerial is used the strength is often greater. The combination of a band-pass tuner and an outdoor aerial is, of course, very good and has been used in recent sets of this type. When an indoor aerial must be used, see that the wire does not lie too close to the walls.

Good Pick-up Connections

There are several ways of connecting a gramophone pick-up to the detector valve of a set. Sometimes a switch is used to break the grid circuit and to connect the pick-up in place of the grid condenser and leak.

Another method, which is not so good, is to connect the pick-up across the grid leak itself, no switch being used. The pick-up is, of course, disconnected during the reception of wireless.

A further method, which is simple and effective, is shown in the diagram. One side of the pick-up is connected to the grid-bias battery and the other side of the pick-up, or potentiometer, when one is used, is taken to the grid circuit. A switch can be used to make or break the connection at the grid end and one is shown in the diagram.



This arrangement of the gramophone pick-up connections is described in the accompanying paragraph

The wire joining the switch and the grid circuit should be as short as possible. In mains sets a long wire here may introduce hum and sometimes the wire is shielded.

Some Screen Facts

Coil screens, if properly designed, do not add appreciably to the losses of the circuit. They are usually of aluminium, although copper is sometimes used.

The cover is spun or drawn and fits over a base. The fit must be a good electrical one. That is, the two parts must be in good electrical contact all round the surface of the lid. Trouble is likely to be the result of a poor contact. For one thing, the shielding effect may not be sufficient to avoid instability and, secondly, the inductance of the coil may be thrown out a little.

With poor screening the amplification may be much lower than the maximum that would be possible with good shielding. Sometimes the contact is not good because the surfaces are not clean. They should, of course, be quite free from varnish or any covering that might be applied to the outer surface for the purpose of preserving the appearance. A good contact must be obtained and so the surfaces ought to be cleaned. Sometimes the pot is slightly too large for the base, and then the results will probably not be satisfactory.

Too Efficient!

When highly efficient valves are used in the detector and output stages and the coupling is a transformer, there is always a chance of instability occurring unless precautions are taken. A whistle may, for example, be heard or the more usual form of self oscillation known as motor-boating may occur.

If the transformer is well decoupled, by connecting a resistance between the high-tension and the primary coil of the transformer and a condenser is joined between earth and the H.T. end of the primary, the motor-boating may vanish.

But there may still be a tendency for the whistle to occur. If the whistle is not actually heard, there may be emphasis of the notes of about a certain frequency. This is to be avoided by connecting a grid leak across the secondary of the transformer. A value of from 100,000 ohms to .5 megohm is often used.

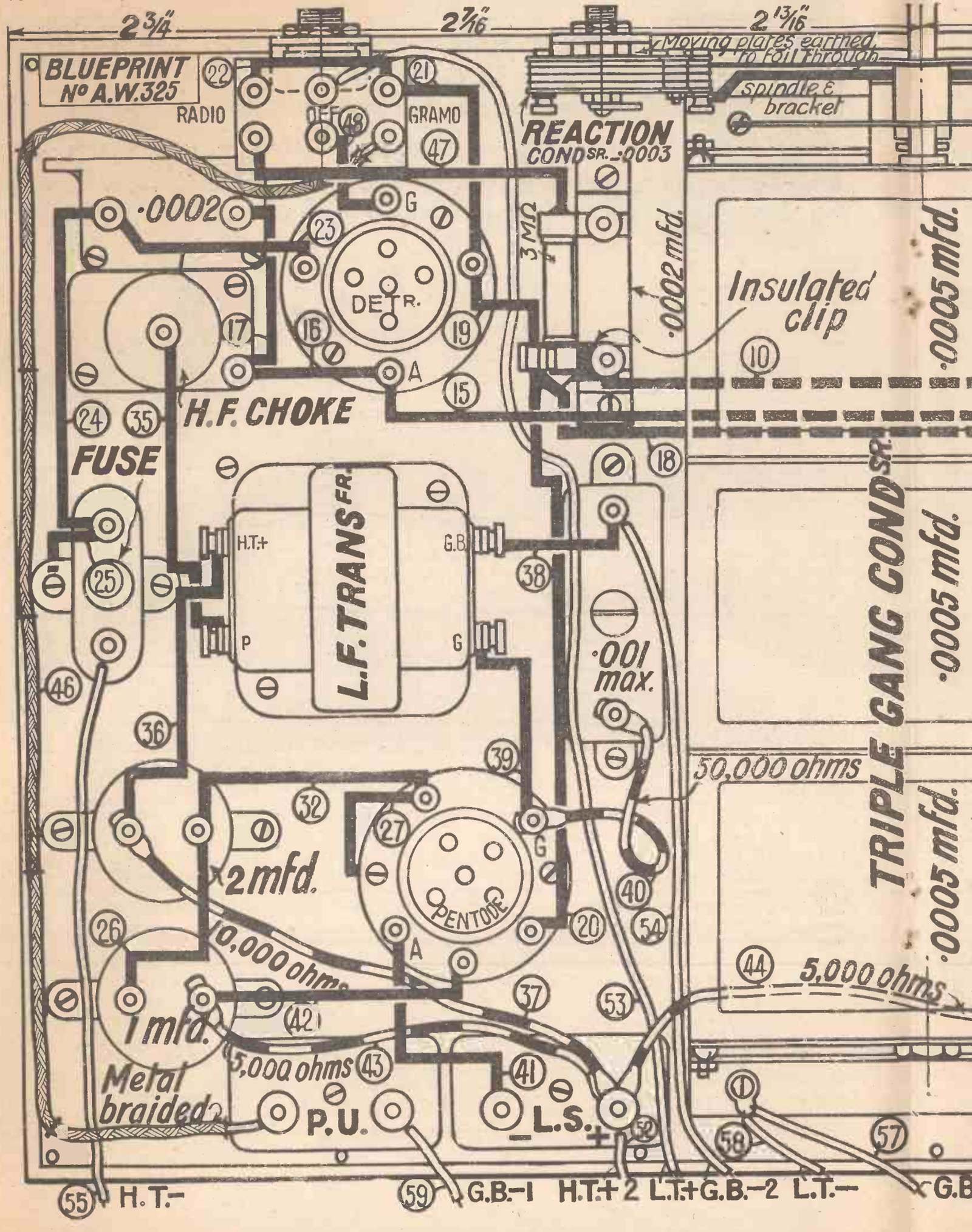
Sometimes a condenser joined across the secondary helps matters, particularly when a pentode output valve is used. This condenser should not have a large capacity, about .00005 microfarad is often suitable.

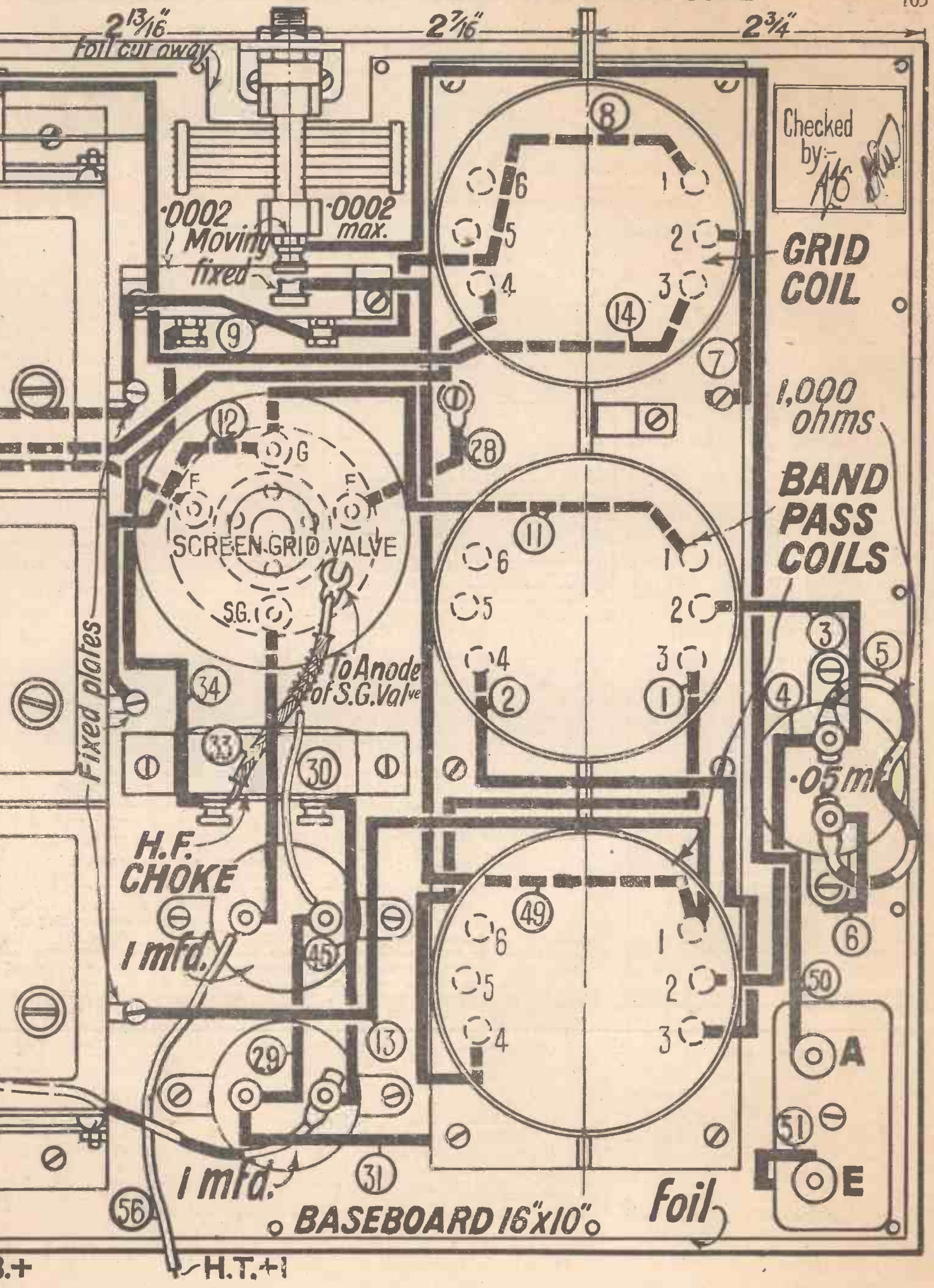
"Anchoring" a Super-het

When testing a super-heterodyne set the other day it was noticed that the results could be affected considerably by changing the connection of the earth to the set.

The receiver had a number of metal-covered parts fitted upon a chassis of aluminium and if the earth wire was connected first to one of the metal covers and then to another metal part, a difference in the stability and the results generally was noticed. Eventually it was discovered that the best results were obtained when the earth was joined to one particular point.

This experimental set was arranged to provide as much magnification as possible, but this peculiarity was enough to show that the design was not right. It goes to show as I have often said, that the earthing of a set is a matter of some importance. Good results will rarely be obtained by wiring all the earth points together and then taking the earth wire to the nearest point at the back of the baseboard.


BLUEPRINT
Nº A.W.325
RADIO
2 3/4"
2 7/16"
2 13/16"
Moving plates earthed to foil Through
spindle & bracket
REACTION COND SR. .0003
GRAMO
DET
DET R.
.0002
.0002 mfd.
3 MΩ
Insulated clip
.0005 mfd.
H.F. CHOKE
FUSE
L.F. TRANS FR.
H.T.+
G.B.
P
G
A
.001 max.
TRIPLE GANG COND SR.
.0005 mfd.
50,000 ohms
2 mfd.
PENTODE
20,000 ohms
1 mfd.
Metal braided
5,000 ohms
P.U.
L.S.
5,000 ohms
H.T.–
G.B.–1
H.T.+ 2
L.T.+
G.B.–2
L.T.–
G.B


2 13/16"
2 7/16"
2 3/4"
Foil cut away
Checked by:-
A.C.
·0002 Moving
·0002 max.
fixed
GRID COIL
1,000 ohms
BAND PASS COILS
SCREEN GRID VALVE
S.G.
To Anode of S.G. Valve
Fixed plates
·05 mfd.
H.F. CHOKE
1 mfd.
1 mfd.
BASEBOARD 16"x10"
Foil
A
E
H.T.+1

The 1932 ETHE

A SET THAT IS

A NEW MASTERPIECE OF THE 'A.W.' TECHNICAL STAFF. FIRST DETAILS OF THIS REMARKABLE SET WERE GIVEN IN A SPECIAL ANNOUNCEMENT IN LAST WEEK'S ISSUE.

IN a special announcement on page 49 of last week's issue, the "1932 Ether Searcher" was introduced and brief reasons were given for its *raison d'être*.

Readers who are using old sets will not need to be forcibly reminded of the necessity for something new to cope with modern ether conditions. Reception on practically every type of set during the past six months has proved that the chaotic condition of European wavelength schemes is calling for ultra-selective sets.

It does not matter whether you want to listen to the local stations or reach out for the Continental broadcasts. Both local and long-distance listeners are affected alike by present wavelength bothers. Owing to the enormous power of certain foreign transmitters, even sets for "quality" local reception must have ample inherent selectivity, for otherwise Continental stations will constantly heterodyne B.B.C. stations, and in order to eliminate the whistle one must resort to a high-note cut-off.

A Present-day Need

For long-distance sets it is obvious that striking selectivity is a vital need, so that one can cut through the more powerful transmissions and find a weaker distant station.

To realise how foreign-station conditions are calling for selectivity is one thing. To get that selectivity is quite a different matter. Another fact is that a very sharply tuned set is difficult to design without causing a cut off and probably actual distortion when the selectivity factor of only one or two tuned circuits is brought to the highest degree. That is another reason why we need modern sets.

Band-pass Tuning

Devices have been produced for getting selectivity on simple circuits. Wavetraps and straight filters are used by many owners of old sets who want to bring the tuning reasonably up to date without scrapping the set itself. Some of these are not worth the complications they introduce. Where they do work and where they produce useful selectivity, they may affect the tone.

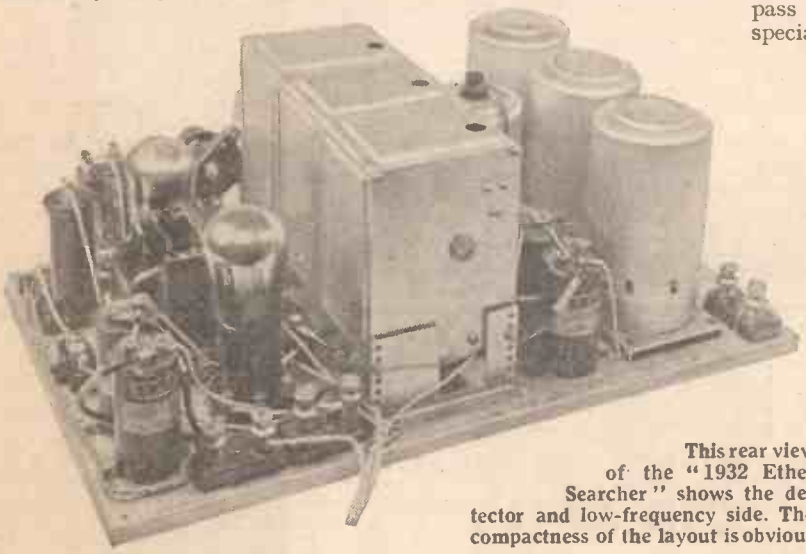
To anybody who wants high-quality reception, this is a retrograde step, for it means that practically every station will be affected by the selectivity of the circuit, whereas if the circuit were not quite so selective at least two or three stations could be obtained without heterodyning and without high-note loss or distortion.

Technical experts are generally agreed that in modern sets the two effective ways of getting good selectivity are by the super-het principle and by band-passing. The new "Ether Searcher" incorporates band-pass tuning of special type.

It does not follow that because any ordinary set has band-pass tuning it is remarkably selective. A poorly designed band-pass set is extremely difficult to work and may affect the tone just as much as any other form of filter.

The AMATEUR WIRELESS Technical Staff worked for months trying out various band-pass filters and testing literally dozens of different types of coil.

A band-pass tuner consists essentially of two circuits, each having a separate coil and condenser. There is adequate screening, so that there is no direct coupling between each.



This rear view of the "1932 Ether Searcher" shows the detector and low-frequency side. The compactness of the layout is obvious

COMPONENTS NEEDED FOR

.0005-mfd. triple gang variable condenser (J.B., type R.3; Utility, Polar, Lotus).
Three dual-range coils mounted and ganged (Colvern type K—pair [illegible] KBLC and one KGR).
Baseboard, 16 in. by 10 in. (Peto-Scott).
Piece of aluminium foil, 15½ in. by 9½ in. (any ironmongers).
One five-pin valve holder (Junit, Lissen, W.B., Lotus, Bulgin, Benjamin).
One four-pin valve holder (Junit, Lissen, W.B., Lotus, Bulgin, Benjamin)
One four-pin valve holder (Telsen, Lissen, W.B., Lotus).
Two .0002-mfd. fixed condensers (Lissen, Dubilier, T.C.C., Formo, Ormond).
One .0002 fixed condenser (Dubilier type 62), T.C.C. type SP., Telsen)
Three 1-mfd. fixed condensers (Dubilier type 9200; Formo, T.C.C., Lissen, Telsen).
2-mfd. fixed condenser (Dubilier, type 9200; Lissen, Formo, T.C.C.)
High-frequency choke (Lissen, "Di-" Varley, Polar, Atlas, Climax, Telsen, Watmel).
High-frequency choke (Readi-Rad, Lissen, R.I., Climax, Wearite, Telsen, Atlas, Watmel).
Low-frequency transformer (Lissen "Hypernik," Telsen Radiogrand, 7 to 1 R.I., Lotus, Igranic, Ferranti, Varley, Lewcos).
.0002-mfd. reaction-type variable condenser (Formo "Midget" with knob, Lissen, J.B, Polar, Lotus, Telsen, Ormond).
.0003-mfd. reaction condenser (Readi-Rad, Lissen, J.B., Formo, Polar, Lotus, Telsen, Ormond).
Double-pole change-over switch (Wearite, type I.22), with terminals

ER SEARCHER

RIGHT UP TO DATE

HERE IS A FULL TECHNICAL EXPLANATION OF THIS WORTHY SUCCESSOR TO THE PRECEDING "ETHER SEARCHERS," AND PRELIMINARY CONSTRUCTIONAL DETAILS ARE GIVEN.

If there were no coupling at all then signal energy could not be passed on from one coil to another. In certain types of band-pass filter the screening is not arranged to be complete. There is partial inductive coupling, so that signal energy is transferred from the aerial side of the filter to the grid side.

In the band-pass coupling used in the "1932 Ether Searcher" the coils and condensers are completely shielded and the circuit is of the very latest type of link-capacity band-passing.

This is such a simple arrangement, as you will find when you come to wire up the set, that you will be all the more surprised at its effectiveness. As in many other sides of radio construction, the simplest way is often the most effective.

Simplicity is, in fact, the keynote of the "1932 Ether Searcher."

Easy Construction

The photographs and the wiring diagram show how ingenuity has been displayed in the layout and how a genuinely striking neatness has been achieved and how the number of parts has been cut down to a minimum.

The set is not of all-metal construction. A stout plywood board, covered with foil, is the foundation. The central component is the large three-gang condenser, the knob of which is the main tuning control of the set. On one side are grouped the band-pass filter coils and the H.F. components, and on the other the detector and power stage parts.

New Features

There is no panel, as the set is designed to fit into one of the modern style cabinets with a wooden front. If this is purchased ready made, then the holes will be drilled for the shafts of the various components.

Just what the set does is best shown by assuming that it is ready built and standing before you with the five control knobs within easy reach. The battery, aerial, earth, speaker, and pick-up connections are made at the back of the set.

The "heart" of the "1932 Ether Searcher"—the band-pass tuner and coupling arrangements. The coils are shown without the screens

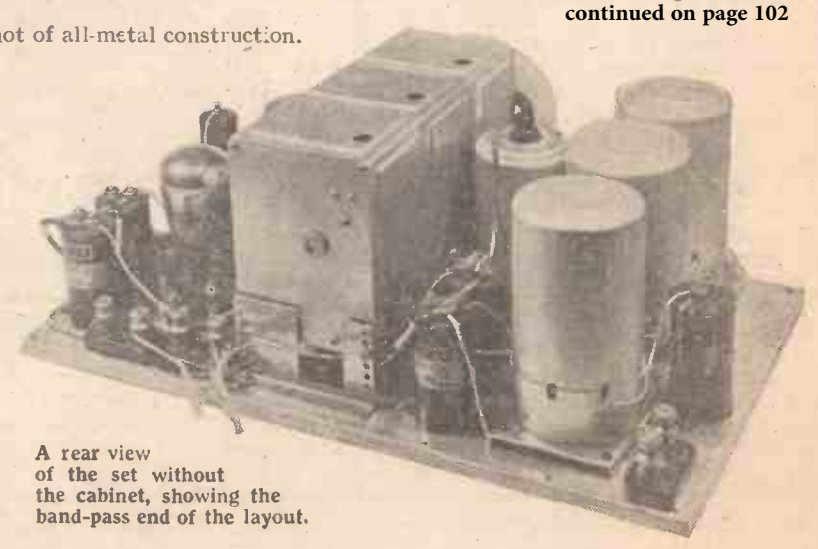
The centre knob is, of course, that of the main tuning condenser.

The circular scale can be seen through an aperture in the panel front above the control. At the right is the reaction condenser, which on most B.B.C. and leading Continen-

continued on page 102

THE "1932 ETHER SEARCHER"

and indicating window "Radio-off-Gramo.")
Pre-set condenser, .0002 mfd. to .001 mfd. (Sovereign type G; Lissen, Ormond, Telsen, R.I., Igranic, Polar).
.05-mfd. fixed condenser (non-inductive) (Dubilier, type 9200 T.C.C.)
Valve screen (Colvern).
Five spaghetti resistances, one 50,000 ohm, one 10,000 ohm, two 5,000 ohm, and one 1,000 ohm (Lewcos, Lissen, Bulgin, Varley, Telsen, Readi-Rad, Sovereign).
3-megohm grid leak (Lissen, Telsen, Dubilier, Sovereign, Graham-Farish)
Fuse holder and fuse (Bulgin, Lissen, Telsen, Readi-Rad).
Three terminal blocks (Lissen, Belling-Lee).
Three yards of thin flex (Lewcoflex).
Connecting wire and sleeving (Lewcos, "Iiffilinx").
Three aluminium brackets to specification (Readi Rad, Peto Scott).
Two spade terminals, marked L.T.—, L.T.+ (Belling-Lee, Clix, Eelex).
Six wander plugs, marked H.T.—, H.T.+1, H.T.+2, G.B.+, G.B.—1 G.B.—2 (Belling-Lee, Clix, Eelex).
Two-foot length of shielded wire (Lewcos).
Cabinet (Peto-Scott).
Speaker (W.B., Type PM3 with cabinet).
120-volt double capacity H.T. battery (Drydex, Lissen, Pertrix, Fuller, Ever Ready).
2-volt accumulator (C.A.V., Exide type D, Pertrix, Fuller).
16-volt G.B. battery (Drydex green triangle, Lissen, Pertrix, Fuller, Ever Ready).



A rear view of the set without the cabinet, showing the band-pass end of the layout.

OUR BROADCAST CRITIC TALKS ABOUT OLD SONGS

ONE of the most acceptable recent forms of broadcast, to my way of thinking, is that which has been entitled "Songs from the Shows." Apart from the actual matter these have contained, the whole thing has been well announced and explained generally.

The fifth of them, subtitled "Old Favourites," was well worth hearing. John Watt, in presenting the show, took care to say when and where the original performances took place, giving at the same time the names of the original actors.

All this was distinctly to the good, I thought. Even so, the broadcast left me a trifle sad, because I realised once more that the old tunes are superior in quality to those in vogue at the present time.

There is no question about it; we are *not* writing tunes anything like as good as the "Merry Widow" waltz, "The Rajah of Bhong," "If you were the Only Girl in the World," and the "Chocolate Soldier" waltz.

As Mr. Watt proceeded to tunes of more recent making I felt there was some falling off in quality. The trouble, as far as I can see, is that we are too firmly bound in the rhythmical sense; we cannot forget the foxtrot. We ought to drop writing tunes in that rhythm except when they are specially intended for dancing.

◆ ◆ ◆

Did you hear *Eric: or, Little by Little?* I wonder what you thought of it.

As a broadcast play it suffered, in the first instance, from cutting; too much was cut and the transition from one scene to another was so sudden that I felt a great deal was lost thereby.

Apart from any weakness of this description, the whole play seemed to me far too harrowing for broadcasting; it struck a horribly human note, somehow. Such a remark admittedly points to the excellence of its presentation; I do think it was very well done. Notwithstanding, I cannot honestly say I feel that a play of that kind does very much for wireless.

◆ ◆ ◆

The New Year's Eve programme was unusually interesting. It seems to me that modern invention indeed plays a part in our lives; the Blattnerphone is going to see to it that nothing of import is lost and that nobody can ever die. The review of the year's events was a story of progress, and should have been enough to remind us that there are some outstanding personalities in our time.

◆ ◆ ◆

The "Grand Good-night" is now an institution. To my way of thinking, it is a graceful act of courtesy, backed by that sense of religion which really lurks somewhere in the best of all of us.

I thought the "Voice of Savoy Hill" sent out a fine stirring message of courage and goodwill; there was something very English in the spirit of that "Good-night and Good-morning."

◆ ◆ ◆

Earlier in the evening I listened to the vaudeville and was introduced to the Baroness Luli von Hohenburg, the Viennese singer who made her *début* in the vaudeville programme. I was a little disappointed in her; perhaps I expected too much. However, I note that I shall have a further chance of hearing her in *Good-night Vienna*.

HAVE YOU SEEN THE SPECIAL ANNOUNCEMENT ON PAGE 89?

◆ ◆ ◆

Hur! Hur! supposedly a film fan's delirium, forced me to the conclusion that it would be wiser not to broadcast anything in the delirious line; it was very poor stuff.

The little sketch called *Economy* was really good. At first, I questioned the desirability of writing sketches with nothing in them but domestic squabbling, but the ending was so surprising and also so amusing that I enjoyed being so easily caught.

As for the *Mrs. Feather* episodes, I am all in favour of them. I have met women just like her; I only hope they listen and realise it!

Miss Doris Gilmore as our cartoonist sees her

◆ ◆ ◆

There was a very good item on the Wednesday: *Bob-sleigh*. The skit at the Proms. entertained me greatly. I thought the title *Walkies* a misnomer, as I have always felt like the fifth sardine in the middle row whenever I have stood in the Prom. I defy anybody to move more than nine inches. I should like to congratulate Charles Brewer on the book of *Bob-sleigh*; there was some really good writing in it.

◆ ◆ ◆

I rather enjoyed Compton Mackenzie in "Idle Thoughts." His thoughts *were* idle, but they entertained me for a few idle moments. He switched about from pantomimes to millionaires and back again in an inconsequent sort of fashion that made the style of his talk all the more interesting. Most talks have a set feeling about them; it is a change to have an informal chat now and again.

◆ ◆ ◆

The Liszt recital on the same evening should have proved acceptable. Unfortunately, I missed the pianist, Frank Mannheimer, but I listened for a few moments to Anne Thursfield, whose voice I have always admired for its quality and production.

I was not too impressed with the songs—but I am not a lover of Liszt in the vocal sense; on the other hand, I enjoyed her singing of them. I should like her to be asked to give a recital of English songs some time.

◆ ◆ ◆

I was somewhat taken aback at reading in the programmes that a work by Handel would be *conducted by the composer*. Had I known that, I should have applied for a ticket for the studio!

I listened attentively to Rootham's "Ode," which was stated to be conducted by Stanford Robinson, but I was disappointed. Academic music makes poor broadcasting; unless a work has real fire and inspiration about it the result is not good.

Arthur Prince, earlier in the week, saved a poor vaudeville; he was splendid. The sketch *Choosing an Instrument* struck me as being very weak in comparison. The Hulbert brothers were not too funny, and I *cannot* get to like a banjo.

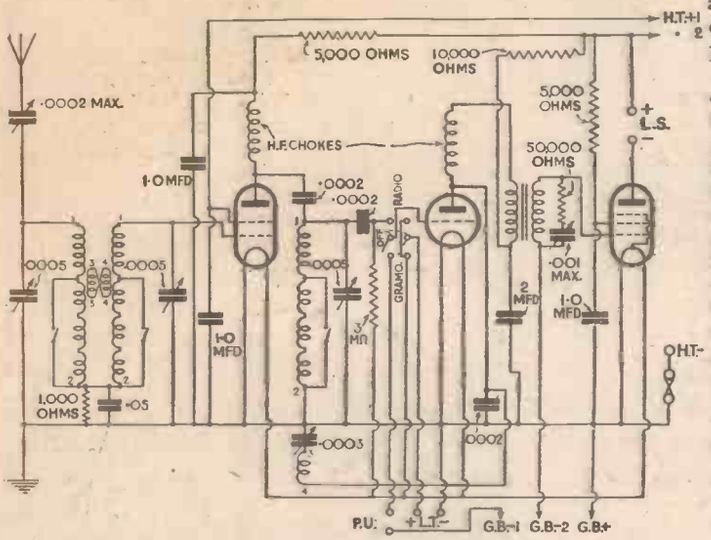
◆ ◆ ◆

The Saturday-night Vaudeville was splendid and Bransby Williams made a first-rate announcer. Jack Payne said that he did not often play "hot" music. Having heard him play a specimen of it, I hope he will in future devote himself entirely to music with the chill off. WHITAKER-WILSON.

"THE '1932 ETHER SEARCHER'" continued from page 101

tal stations can be used mainly as a volume control.

Matching up with this on the left-hand side of the main control is the trimming condenser. This is in series with the aerial lead. Its full use will be explained later in the operating notes. It simplifies tuning



This is the theoretical circuit of the "1932 Ether Searcher." Study this in conjunction with the full-size blueprint and see how the components of each part of the circuit are arranged. Note the band-pass connections

and acts as a selectivity and volume control.

At the extreme left-hand side of the set is the neat rotary wave-change switch.

Gramo-Radio

Matching up with this on the right-hand side of the set is a most ingenious on-off and radio-gramophone switch. In the central position this switches the whole set off. When the knob is turned in one direction the set is switched on for radio, and when it is turned in the opposite direction it brings a gramophone pick-up into circuit and rearranges the set for gramophone reproduction.

There is no complicated plug and jack switching, and the pick-up remains permanently connected to the small terminal block at the back of the set.

A further good point is that when the set is switched on to "gramophone" the filament of the screen-grid valve is switched off and an entirely separate negative grid-bias tapping is brought into play which places the negative bias on the grid of the detector valve. The use of a Lissen inter-valve transformer and a variable tone device ensures good quality.

At this stage potential constructors may be wondering by how much the cost of the set has been increased by its luxury specification. In control and performance the "1932 Ether Searcher" rivals commercial sets of the best calibre, and it is all the more surprising to find that an extremely low figure has been arrived at for the total cost of construction.

A full list of parts, with suitable alternatives, is given in the accompanying panel.

The modern design of the complete set is typified by the cabinet specially designed by Messrs. Peto Scott.

It should be unnecessary to explain how the wiring plan is used when building the set. It not only shows you just where to mount all the parts, but gives the wiring and the connection details of each component.

The centre pages of your copy should be detached complete, so that you have the constructional details at hand while making up your new "Ether Searcher," and you should remove the full-size wiring plan so that as its first job it can be used to show the position of each part.

Full-size Plan

This full-size wiring plan is every bit as useful as one of the standard AMATEUR WIRELESS blueprints. The only difference, of course, is that the wires are shown in black lines on the white paper, whereas on a blueprint the wiring is in white on the blue.

The presentation of this full-size print with the current issue means that even a man who has never tried to build a set before will be able to visualise at once how the parts are arranged on the baseboard. A good feature of the set is that there is no under-baseboard mounting or wiring. All the parts are on the top of the baseboard. Nor is there any panel. The knobs of the various parts on the front of the set project through the wooden front of the cabinet. It is therefore extremely simple to study the wiring plan carefully and see exactly where to put the triple-gang condenser, the three coils, valve holders, low-frequency transformer and the few other parts which make up the specification of the "1932 Ether Searcher."

Not only can the print be used as a template to show the exact positions of each part, but when it comes to wiring you will find it invaluable in showing where each lead goes and in wiring up the more complicated details, such as the switch points.

Experienced constructors will be able to go ahead with the work of making up the new set by following the wiring plan, the photographs, and the components list.

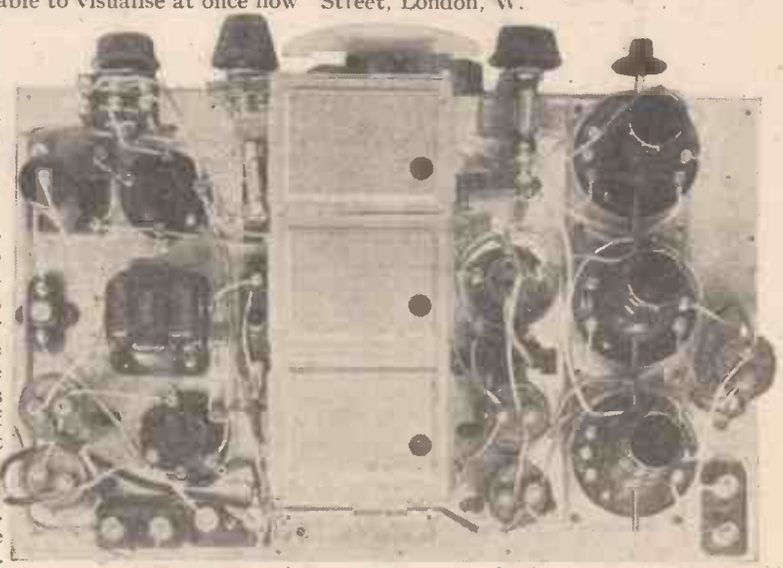
Detailed constructional particulars will be given in next week's issue, so that even a man who has never before ventured on the home construction of a set need have no fear that he will get poor results or waste money by making faulty connections and burning out valves.

RECOMMENDED VALVES

Make	*S.G.*	*Detector*	*Power*
Mullard ...	PM12	PM1HL	PM22
Marconi ...	S22	HL2	PT2
Osram ...	S22	HL2	PT2
Mazda ...	SG215	HL210	Pen220A
Cossor ...	215SG	210HF	230PT
Six-Sixty	215SG	210H	230PP
Lissen.....	SG215	HL210	PT225
Eta	BY6	BY2023	—
Fotos.....	BC150	BC18	BD100
Dario.....	SG	HF	—
Tungsram	S210	H210	PP230

There are no snags in the construction and the full-size plan gives most of the details that the more experienced constructor will need to know. Make sure of the next issue, for owing to the popularity which our new set is bound to create there will be a "run" on it.

London readers can see the "1932 Ether Searcher" in the radio department windows of Messrs. Selfridge & Co., Ltd., Oxford Street, London, W.



If you study this plan view in conjunction with a full-size blueprint, you will have no difficulty in getting the parts in their right positions and completing the wiring

A chamber-music concert by the Unity Quartet will be broadcast from the Royal Society of Artists' Gallery, Birmingham, on January 26, when Taneiev's "Quartet in D Minor" will be given.

A weekly review of new components and tests of apparatus conducted by J. H. Reyner, B.Sc., A.M.I.E.E.

Chelmer Mains Transformer

THE Chelmer mains transformer has been designed for use in rectifying circuits for supplying high-tension current only. There are thus only two windings on the transformer: the primary, suitable for inputs of 230 volts 50 cycles, and the second, rated to give the 135 volts necessary for the normal voltage doubler circuit. The primary winding is in two sections, these being assembled one either side of the secondary winding.

The transformer has a substantial laminated core clamped with aluminium end pieces, provided with lugs to enable the transformer to be bolted or screwed to the baseboard. Two small pieces of ebonite are mounted on top and at either side of the transformer and accommodate the input and output terminals.

The transformer was tested by wiring it into a rectifying circuit which included a Westinghouse H.T. 7 unit, the reservoir condensers each being 4 microfarads. The input voltage was 240 volts 50 cycles. On open circuit the D.C. voltage obtained was 288, while with a load of 30 milliamperes it was 175. The voltage to be expected with loads between the above limits can be estimated from the curve accompanying this

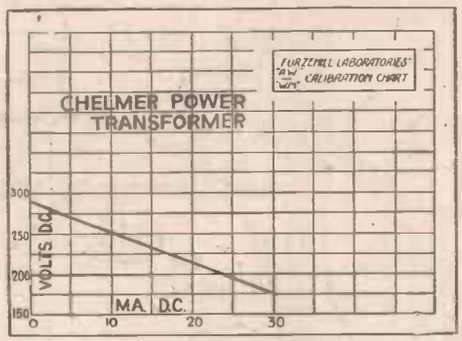
A Chelmer mains transformer

report. With the secondary winding on open circuit the power consumption was measured to be 7.4 watts.

These transformers are manufactured by Messrs. E. Edwards & Co., 5 Bradford Street, Chelmsford.

A Good Speaker Unit

THIS week we have tested one of the new Telsen moving-iron speaker units. This small and very compact unit is housed in a brown moulded bakelite case provided with lugs to facilitate mounting. The case also carries the terminals for the connecting leads, the positive and negative terminals being clearly indicated. On the metal back plate of the unit are mounted two small bar magnets arranged about



Performance curve of the Chelmer transformer tested

¼-in. apart. The operating coil and associated pole piece are mounted at one end of the unit, the pole piece acting as a bridge across the ends of the magnets.

On test a 10-in. diaphragm was fixed to the unit, and the assembly mounted behind a baffleboard. The results were good, the reproduction of speech and music being very natural. We were, in fact, surprised on removing the cover that such results should be given by so small and simple a unit. The sensitivity was normal for this class of unit, the power-handling capacity being adjustable by altering the position of the armature over the pole piece.

Mains Power Radio Unit

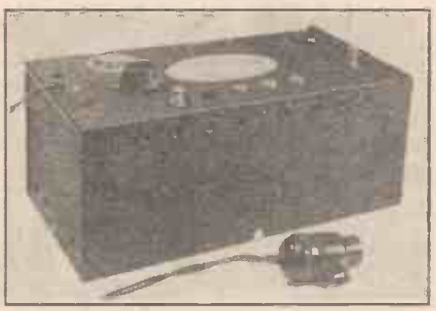
AN interesting new eliminator of a rather unusual type which we have tested this week is that manufactured by Messrs. Mains Power Radio, and known as the model A.C.5. This eliminator has been designed for an input of 200 to 250 volts at 40 to 100 cycles. Outputs are provided for three high-tension voltages, these being rated at 60 to 80 volts for the screen grid of the H.F. valve, 60 to 80 volts for the detector, and 120 volts at approximately 15 milliamperes.

A special feature of this eliminator is that an output of smoothed low-tension voltage is provided for the filaments of the valves in the receiver. The low-tension voltage is nominally 2 volts, but this can be adjusted to meet varying load conditions by means of a small variable resistance.

Metal rectification is employed throughout, the high-tension rectifying unit being of the Westinghouse type, while that in the low-tension circuit is of a special patented construction and is manufactured by the makers of the eliminator themselves. A single-wave rectifier is used for high-tension circuit, the smoothing consisting of a constant-inductance iron-cored choke in the positive lead in conjunction with the usual condensers. Each output is condensered with the exception of that to the screen grid which is usually condensered inside the receiver. A bridge type rectifier is used in the low-tension circuit, the output being smoothed by means of a constant-inductance choke and a 5,000-microfarad electrolytic condenser.

The low-tension output voltage can be varied by means of a small series variable resistance, the actual output voltage being indicated by a small hand-calibrated voltmeter.

The eliminator is housed in an attractive metal case crackle-finished in blue. The



One of the range of Mains Power Radio units, the A.C.5

terminals and the low-tension voltmeter and control are mounted on the top of the case itself. An input connecting flex 8 ft. long is included, this being provided with an adaptor suitable for use with plug or wall-type sockets.

On test with an actual receiver the eliminator worked satisfactorily with only a faint background of hum. A quantitative test was also imposed with the following results, the input voltage being 240 at 50 cycles. With loads of 14, 2, and 0.5 milliamperes the voltages respectively on the power, detector, and screen-grid taps were 100, 55, and 65 volts. The low-tension output was found to be just under 2 volts with a load of .4 ampere. It will thus be seen from the above that the H.T. voltages are slightly on the low side, but that the eliminator is suitable for most three or four-valve receivers requiring up to approximately 16 milliamperes total H.T. consumption, and .4 ampere at 2 volts for the filament supply.

THE PICK OF THE MONTH'S RECORDS

A GUIDE TO THE BEST OF THE LATEST RELEASES.

The records reviewed below are a careful selection of the best of the recent issues. It will be noted that criticism is chiefly devoted to the treatment of the music and quality of recording rather than the actual composition.

ORCHESTRAL RECORDS

Cavalleria Rusticana—Selection, 2s. 6d. **STERNO 8019**
Another tolerably good performance by the Städtischen Opera Orchestra. It covers the ground quite well.

Pagliacci—Selection, 2s. **CRYS Z101**
By members of the Berlin Philharmonic Orchestra. Naturally, not a very massive performance, but pleasing, all the same.

Mosaic Fantasia on "Coppelia," 4s. **H.M.V. C2204**
A skilful, sharp performance, but the recording is a little too strident in places.

Vienna Woods and Russian Potpourri, 1s. 6d. **BRDCST 3114**
By Eugene's Magyar Tzigane Band. The performance is much as you would expect, with fitful tempo and lots of energy.

Toy Symphony (Haydn), 4s. **COL DX311**
Another delightful record for the "party" season. This was *Haydn's* joke; and the introduction of toy musical instruments make a fascinating piece. This recording is splendid; Weingartner takes the British S.O. through it as if they are really enjoying the fun.

Marriage of Figaro and Il Seraglio—Overtures, 4s. **H.M.V. C2194**
Two very thorough performances by the Vienna Philharmonic Orchestra. Recommend a soft (or fibre) needle!

Cavalcade Suite, 4s. **H.M.V. C2289**
The New Mayfair Orchestra do it all very well.

Der Freischutz Overture, 6s. **COL LX154**
This record must be heard several times before it begins to grow on one—unless you know it already, of course. The performance by Mengelberg's Concertgebouw Orchestra is a masterly one.

Nuit sur le Mont Chauve, 6s. **H.M.V. D2010**
A descriptive piece by Moussorgsky. The theme is not new—evil rites and so forth—and the music is of the type found in other compositions built around similar stories. But the L.S.O. under Albert Coates give it more than a little of the uncanny.

Prelude in C sharp Minor and Intermezzo—Cavalleria Rusticana, 4s. **H.M.V. C2292**
These two need no discussion. The performance by the L.S.O. (under Dr. Malcolm Sargent) is effective and should please everybody.

Soul of the Violets and Poor Kid, 1s. 6d. **ZONO 5979**
If these numbers appeal, the performance of the Zono Salon Orchestra is quite adequate.

Tannhauser Selection, 4s. **H.M.V. C2293**
Another full-bodied performance by the L.S.O. This record is sure to be popular—deservedly.

Madame Butterfly Selections, 2s. **CRYS Z100**
Another quite effective record by members of the Berlin Philharmonic Orchestra.

BAND RECORDS

The Leek, 2s. 6d. **STERNO 8020**
A good enough performance by the Kneller Hall Band. But these "hashes" (even vegetable ones!) are appearing much too frequently on the menu.

Hungarian Rhapsody No. 1, 1s. 6d. **BRDCST 3115**
A really good performance by the Welsh Guards Band.

DANCE RECORDS

The Piccadilly List, 1s. 1d.
This company has a heavy collection this month. All seem to observe the canons of modern dance music, but the following numbers are the best:

Smile, Darn Ya, Smile, and Sing a Little Jingle ...	...	857
Maybe it's the Moon, and Two Little Blue Little Eyes	...	868
Childhood Memories, and Savoy Christmas Medley	...	401
The Way With Every Sailor, and Over the Blue ...	...	856
Scotch Reels, and Scotch Strathspeys (Accordion Solos)	...	850
Makin' Faces at the Moon, and Just One More Chance	...	848
Got a Date With an Angel, and Who Do You Love?	...	855

From Zonophone, 1s. 6d.
The sensation from this company is, of course, Jack Hylton's Band. This band and the Rhythmic Eight provide all the high lights, the best of which are:

Life's Desire, and On a Cold and Frosty Morning ...	...	5994
'Neath the Spell of Monte Carlo, and Over the Blue	...	5996
Got a Date With an Angel, and For the Love of Mike (Medley)		5993

The Rhythmic Eight:

If You're Really and Truly in Love, and I'm a Hundred Per Cent in Love		5993
Jolly Good Company, and It Always Starts to Rain	...	5989

Winner and Radio, 1s. 6d. and 1s.
The former have two good numbers on their latest list:

Me, and Begging for Love	...	5407
Pagan Serenade, and There's Something in Your Eyes	...	5408

Both by Eddie Gross-Bart and the Café de Paris Band.

Looking for You, and That's What I Like About You Radio 1565

INSTRUMENTAL RECORDS

Study in C Minor and Fantasie Impromptu, 1s. 3d. **IMP 2561**
Two Chopin pieces on the piano by that boy genius, Wilfred Worden. They are not so good as his Rondo Capriccioso, but that is the fault of the recording. They still remain a performance to marvel at.

Serenade and Chant Sans Paroles, 1s. 3d. **STERNO 798**
These two popular pieces (from "Les Millions d'Arlequin" and Tschaikowsky's famous composition) are, shall we say "sturdily" played by Meyrowitz's Octette.

Quintet in A Major (Dvorak, Op. 81), 24s. **COL LX150-3**
By the Lener String Quartet (with Pianoforte). This is another composition, much of which may be played to those who dislike Chamber music.

Polichinelle Serenade and Dance of the Marionette, 4s. **H.M.V. DA1215**
Two violin solos—dainty trifles—played by Kreisler.

Allegro from the Sonata in A for Violin and Piano (Franck), 2s. **BRDCST 5257**
A sound performance by Winifred Small and Maurice Cole. The recording is badly at fault on Side 2.

VOCAL RECORDS

Vocal Gems from "The Mikado," 1s. 6d. **PANA 25084**
An excellent performance by the London Light Opera Company. Full-blooded and very English.

Royal Hawaiian Hotel and Haole Hula, 2s. 6d. **BRUNS 1199**
Two quaint, attractive numbers by the Hawaiian Girls' Glee Club. Their pronunciation is better than anything from America yet!

Ombra Mai Fu and Ave Maria, 2s. **BRDCST 5256**
Eva Liebenberg has a truly magnificent voice and fine enunciation.

Faery Song and June Music, 2s. 6d. **H.M.V. B3905**
Two unusual songs beautifully sung by Walter Glynne.

Ye Banks and Braes and O Sing to Me the Old Scotch Songs, 2s. 6d. **H.M.V. B3832**
By Joseph Hislop. The second is the better, but neither is near his former standard.

They All Make Love But Me and You Used to be My Sweetheart, 1s. 1d. **PICC 851**
Two light numbers, most pleasantly sung by a light baritone—Arnold Knight. The first has a humorous flavour.

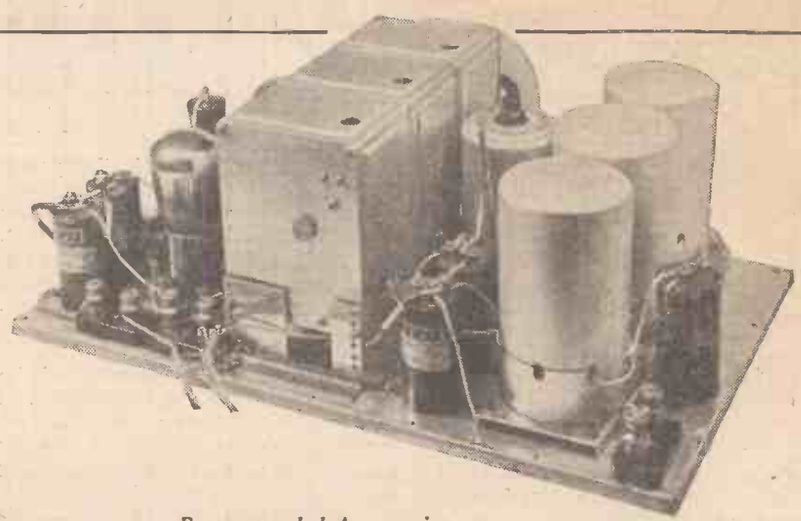
I Hear a Thrush at Eve and For You Alone, 1s. 6d. **BRDCST 3111**
These two favourites are well sung by Trevor Owen (tenor). There is no attempt to force either, and the recording is good.

Miserere Scene, "Il Trovatore" and Fairest Daughter of the Graces, "Rigoletto," 4s. **COL DX302**
These operatic excerpts are sure to tempt many. The singing is first rate and the volume in (2) terrific.

(*Continued on page* 112)

IMMEDIATE DISPATCH
of MATCHED 1932 ETHER SEARCHER KITS
Tested and Passed by Mr. G. P. KENDALL, B.Sc.

The importance of using accurately matched kits cannot be too greatly stressed. Every Ready Radio 1932 Ether Searcher Kit is matched under the personal supervision of Mr. G. P. Kendall, B.Sc. Order from Ready Radio and be sure of getting guaranteed accurately matched components.



1932 ETHER SEARCHER APPROVED LIST

	£	s.	d.
1 Polished Oak Cabinet with baseboard, 16" × 10" -	1	0	0
1 J.B. .0005 Triple-gang variable condenser, Type R.3.	1	9	6
1 Set of Colvern Coils as specified (2 BLC, 1 KGR)	1	8	6
1 Piece of aluminium foil, 15¾" × 9¾" - - - -		1	6
1 five-pin valve holder - - - - - - - -			10
2 four-pin valve holders - - - - - - - -		1	0
3 T.C.C. .0002 fixed condensers, Type 34 - - -		4	6
3 T.C.C. 1-mfd. fixed condensers, Type 50 - - -		8	6
1 T.C.C. 2-mfd. fixed condenser, Type 50 - - -		3	10
1 Lewcos H.F. Choke, Type M.C. - - - - -		2	6
1 Readirad Standard H.F. choke - - - - -		4	6
1 R.I. L.F. transformer, Type G.P. - - - -		10	6
1 Formo .0002 Midget reaction condenser with knob		3	0
1 Readirad .0003 solid Dielectric reaction condenser		3	6
1 Wearite double pole, change over switch, Type 1.22		4	0
1 Sovereign pre-set condenser, Type G - - -		1	6
1 Valve screen - - - - - - - - - -		2	9
1 T.C.C. .05 non-inductive condenser, Type 40 - -		1	9
1 Lewcos 50,000 ohm Spaghetti resistance - - -		1	6
1 Lewcos 10,000 ohm Spaghetti resistance - - -		1	0
2 Lewcos 5,000 ohm Spaghetti resistances - - -		2	0
1 Lewcos 1,000 ohm Spaghetti resistance - - -			9
1 Readirad 3-meg. leak and holder - - - - -		1	4
1 Readirad fuse and holder - - - - - - -		1	3
3 Belling-Lee horizontal mounting terminal blocks -		2	0
6 Belling-Lee terminals, type R - - - - - -		1	6
6 Belling-Lee wander plugs - - - - - - -		1	0
2 Spade terminals - - - - - - - - -			3
1 Set aluminium brackets as specified - - - -			9
3 Valves as specified, P.M.12, PM1HL, PM22 - -	2	8	6
1 Packet of Jiffilinx for wiring - - - - -		2	6
Flex, screws, shielded cable, etc. - - - - -		2	6
	£9	19	0

Recommended Accessories

	£	s.	d.
1 Pertrix 120 volt super capacity H.T. battery -	1	5	6
1 Pertrix 2 volt accumulator Type PAC.3 - - - -		11	0
1 Pertrix 15 volt grid bias battery - - - - -		2	3
1 Bluespot loudspeaker, 44 R	2	12	6

TO INLAND CUSTOMERS. — Your goods are dispatched post free or carriage paid.

TO OVERSEAS CUSTOMERS.— Everything Radio can be supplied against cash. In case of doubt regarding the value of your order, a deposit of one-third of the approximate value will be accepted and the balance collected by our Agent upon delivery of the goods. All goods are very carefully packed for export and insured, all charges forward.

GIVE YOUR 1932 ETHER SEARCHER INSTAMATIC OUTPUT

Use an Instamat Output Transformer in the output circuit of your 1932 Ether Searcher. Combines all the advantages of an Output Transformer of the most perfect design, with the unique advantages of *instant matching* of output valve and speaker Price **27/6**

For all speakers except low-resistance moving coils.

INSTAMAT MAJOR (for low-resistance moving coils). Price **37/6**

Send four 1½d. stamps for your copy of Kendall's latest book entitled "10 Hours for Modern Radio Constructors." Packed full of useful information.

Ready Radio

CASH or C.O.D ORDER FORM

To: Ready Radio, Ltd.
Eastnor House,
Blackheath, S.E.3.

Please dispatch to me at once the following goods .....

.....

for which {(a) I enclose / (b) I will pay on delivery} (Cross out line not applicable) £.....

NAME .....

ADDRESS .....

..... A.W. 16/1/32

EASY PAYMENT ORDER FORM

To: Ready Radio, Ltd.,
Eastnor House,
Blackheath, S.E.3.

Please dispatch to me the following goods .....

.....

for which I enclose first deposit of £.....

NAME .....

ADDRESS .....

..... A.W. 16/1/32

Don't Forget to Say That You Saw it in "A.W."

SETS OF DISTINCTION

COLUMBIA 4-VALVER CONSOLE

Makers: Columbia Graphophone Co., Ltd.
Price: 23 guineas

THIS set is advertised by the makers as a challenge to the American set invaders; I am very glad to discover a British firm able to produce for such a moderate all-in cost a really first-class four-valver with moving-coil loud-speaker for mains operation. Due to the superior characteristics of British valves compared with American valves, we do not need so many valve stages as the Americans to produce a given result. This point is made abundantly clear by my tests of the Columbia four-valver.

A Powerful Set

It is difficult to imagine how anyone could want more amplification from normal signals when this set is going all out. Any increase in the number of valve stages would seem to be superfluous, unless you want the knife-edge selectivity of a super-heterodyne set.

This is a console, which means that everything for reception except the aerial and earth and mains are self-contained in the handsome walnut cabinet. Even the aerial may be entirely dispensed with if the mains aerial terminal is adjusted, but under this condition only the locals and the more powerful foreign stations can be guaranteed.

Here we have a powerful four-valver, designed on the latest metal-chassis lines, driving a moving-coil loud-speaker of the energised type. Models are available for all A.C.-mains supplies between 100 and 250 volts, of periodicities between 40 and 60 cycles. The adjustment for the correct mains voltage is easily got at by removing the back of the cabinet—only two screws have to be undone.

Neat Design

When I took off the back I was at once impressed with the neat chassis, the layout of which can be seen from the drawing reproduced on this page. It will be seen that screening is extensively practised, as indeed it must be in such a powerful set, with two stages of high-frequency amplification, a detector and a super-pentode output valve.

The two screen-grid valves for high-frequency amplification and the detector valve are all fitted under cans arranged in a line parallel with the three screened coil units. Next to these coils is the three-gang condenser for tuning, and the rest of the chassis is taken up with the power equipment.

Note in the drawing the neat plug coming from the loud-speaker to the chassis. This connects up the loud-speaker to the output of the pentode and also brings in the mains energy for the loud-speaker field.

The Circuit

The general circuit arrangement of the four valves is notable for the care taken in decoupling all vulnerable points, both at high- and low-frequency. High-frequency transformers are used for the aerial tuning and inter-valve couplings. The detector circuit is well filtered and following this is a parallel-fed transformer stage. The pentode is transformer coupled to the loud-speaker and properly tone-corrected.

In addition to the four valves for the amplifying and detector stage there is a valve for rectifying the A.C. to make it suitable for the anode supplies. Two Mazda MSG/HA valves are used for the screen-grid stages, a Mazda AC/HL for the detector, an Osram PT_4 for the output and an Osram U12 for the valve rectifier.

Now let me deal with the controls, which can be seen in the picture at the top of this page. There are only three knobs to operate, as the control has been greatly simplified by combining switch functions under one knob. The knob on the left, for example, is not only the screen-grid volume control—it also works the mains switch at its minimum position. This is a great convenience, and the control of volume is exceptionally smooth, with no appreciable alteration in the tone as the output is varied.

The centre knob works the three-gang condenser and, of course, the tuning scale, which is brightly illuminated when the set is switched on. It is also well calibrated in wavelengths, the divisions being commendably clear. Although the makers claim only approximate accuracy for these calibrations I found them good enough to enable me to get straight on to wanted foreigners.

Medium waves go from 200 to 550 metres, in steps of 50 metres, and long waves from under 1,000 to 2,000 metres, in steps of 100 metres. The best plan is to turn the tuning knob to the wavelength required, and then, having found the station, readjust slightly for maximum volume.

Simple Controls

The knob on the right is another combination control, providing at its three settings a choice of medium waves, long waves or cutting out the high-frequency amplifier and bringing in an externally connected pick-up for gramophone-record reproduction.

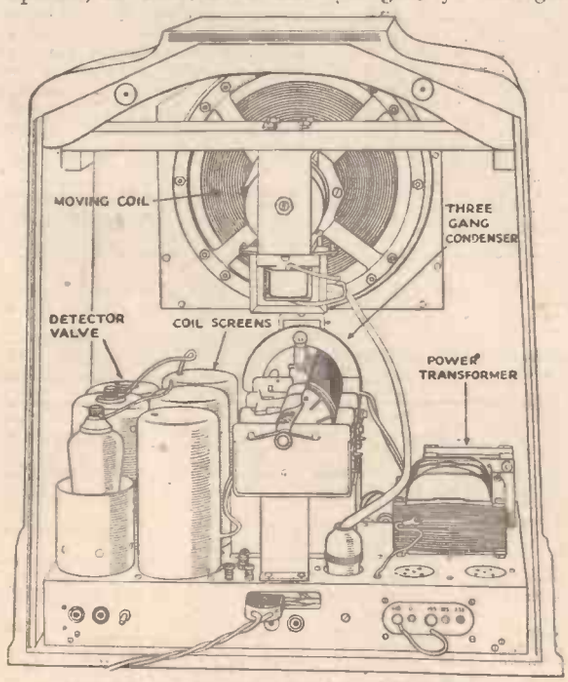
All the controls of this Columbia set work smoothly and silently, and due to the combination switch knobs on the left and right the user immediately gains a favourable impression of simplicity.

For this set the makers recommend an aerial of about 70 feet total length, so my standard 60-footer was very suitable for the test, which, as usual, was carried out in south-west London, some 20 miles from Brookmans Park.

Using the blue aerial socket—there is a grey socket for short indoor aerials—I was soon able to get plenty of foreign stations, and I found the background of mains hum almost negligible.

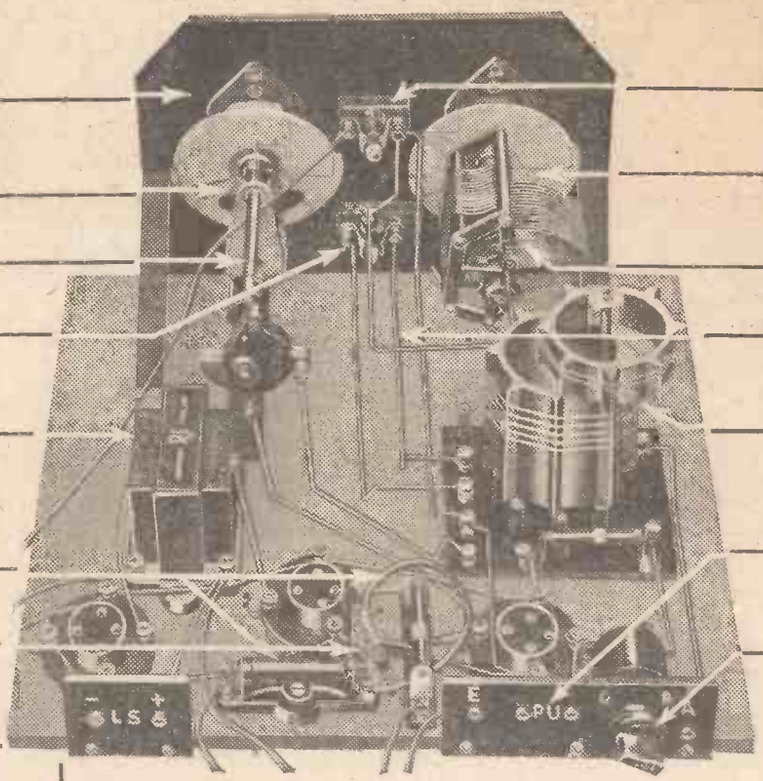
Some idea of the selectivity can be gained from my reception of Strasbourg below and Toulouse above London Regional, these

(*Continued on page* 112)



This sketch of the back of the Columbia Console gives a good idea of the neat layout

HEAR AMERICA TO-MORROW NIGHT



METEOR III KITS

Complete set of quality components, including panel (cut and drilled), baseboard, Jiffilinx, flex, screws, plugs, etc.

75/-

or 9/- down and 7 monthly payments of 10/6.

STANDARD CABINET KIT (Complete Kit with Standard Cabinet to house set only) **89/6**

or 11/- down and 8 monthly payments of 11/-.

CONSOLETTE CABINET KIT. (Complete Kit with Consolette Cabinet to house set, speaker and batteries **£5 0 0**

or 11/- down and 9 monthly payments of 11/.

Valves are not included in the prices shown. Mullard Valves are recommended by the designer.

BUILD YOUR METEOR TO-NIGHT

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USING THE NEW D.C. MAINS VALVES

Useful hints and tips on mains working are contained in the following article by the "Amateur Wireless" Technical Staff

UNTIL the golden age of electricity arrives, when all the country is on a common A.C. supply of a standard voltage and periodicity, set designers will have to go on producing sets suitable for both A.C. and D.C. inputs. To a large extent, the A.C. valves now available meet the needs of designers, but until recently the facilities among valves for D.C. mains have been very limited. Why, it might be asked, do we need special D.C. mains valves—would not the A.C. valves serve?

They certainly would, but the expense of running them from D.C. mains would be considerable. When we use A.C. valves, with indirectly heated filaments, on an A.C. supply, we cut down the mains voltage from its 200 or 250-volt maximum to the low voltage of 4 volts. We might have three of these valves, each taking 1 ampere current. These would be conpected in parallel, so the total current consumption of the trio would be 3 amperes.

What we are concerned with at the moment is the wattage of these valves, for that determines the cost of running, which is based on kilowatt-hours. Watts are equivalent to the voltage multiplied by the current, so for the three valves just mentioned the wattage is 4 multiplied by 3, because the voltage at which 1 ampere will flow through each valve is 4 and the current total of the three valves is 3 amperes.

Mains Valves Wattage

Note that when estimating the watts of the filament circuit in an A.C. set we take the stepped-down voltage and not the voltage of the supply. The primary winding of the mains transformer is connected to the mains voltage, and the secondary winding to the filament circuits. The secondary watts is therefore 12, and allowing for a slight loss in the transformer, due to heating and eddy currents, the power taken from the A.C. mains is not much more than 12 watts.

Now let us consider what happens to the wattage when these three A.C. mains valves are connected in a D.C. mains circuit. There is no transformer, so whatever the total current taken by the valve filaments may be, we shall have to multiply this by the voltage of the mains to arrive at the total wattage. This is why it would be so expensive to use A.C. mains valves on a D.C. supply.

It would be out of the question to connect the valves in parallel for D.C. mains working, for the total wattage would then be, on a 200-volt supply, 200 × 3, or 600 watts—as much power as is taken by an electric radiator! We can reduce this colossal figure to something more practicable by connecting the valve filaments in series. Then the total current will be the current flowing through any one of the valves, namely 1 ampere. Therefore the wattage would be the voltage of the mains multiplied by 1 ampere, or on a 200-volt supply, 200 watts. Even this is excessive, and would entail large resistances to dissipate the heat generated.

Some New Types

From what we have said, it is clear that, with the filaments in series, the only way to reduce the total watts consumption is to reduce the current consumption of each filament. The Mazda D.C. mains valves introduced some time ago had this object in view. The filament rating of this series was .5 ampere, so that a series of them connected to a 200-volt D.C. supply entailed a consumption of 200 × .5, or 100 watts.

Lately, another series of D.C. mains valves has been produced by the Marconi Osram Valve Company, Ltd., and these are marketed by the General Electric Company as Osram valves and by the Marconiphone Company as Marconi valves.

In designing these valves the main conditions were economy of operation, easy dissipation of heat, and adequate insulation between cathode and heater. Another idea was to make the characteristics of the D.C. valves similar to the A.C. valves in the Osram and Marconi ranges. This meant using a 4-watt filament. The current consumption of these valves is only .25 ampere, so the filament voltage has to be 16 volts.

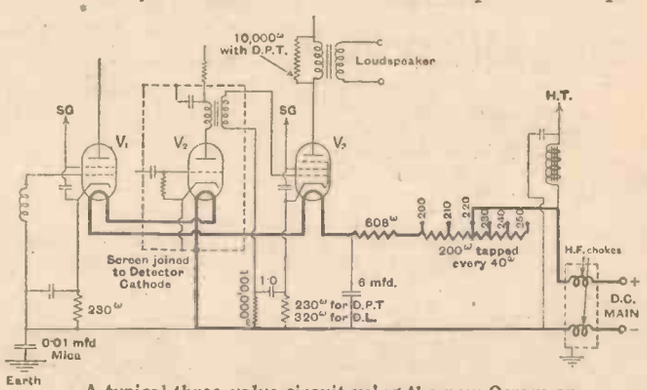
Interesting Features

The choice of a 16-volt filament with a .25-ampere consumption means that on a 200-volt supply the total power taken by a series of these valves is only 200 × .25, that is, 50 watts. It might be asked why a still higher voltage is not used for the filament, with a still further reduction in the current consumption and consequently in the mains consumption. The answer is that there is a limit to the safe difference of potential that exists between the heater and the cathode of the valve at the end of the series, assuming that the filaments are wired in series and the cathodes in parallel.

With 16-volt filaments, or rather heaters, to give them their right name, up to six valves can be connected in series without any trouble. The difference of potential between the heater and cathode on the last valve of the six would be 96 volts.

There are now five of these Osram and Marconi D.C. mains valves, comprising two screen-grids, a detector, a low-frequency valve, and a pentode output valve. There is a perfectly good reason for using a pentode output valve instead of a three-electrode valve in a D.C. mains series. The maximum voltage of the average D.C. supply is 200 volts, and allowing for the grid-bias voltage, which is at the expense of the anode voltage, there is not too much left for the anode voltage of the last valve.

The pentode needs less bias voltage on its grid than a normal power valve, and moreover the undistorted output from a pentode is greater for a given anode voltage.



A typical three-valve circuit using the new Osram or Marconi D.C. mains valves

Recently, some research work on these new valves has brought to light several useful points of interest to those intending to make up sets for D.C. mains working. It is found as a general rule that hum is more difficult to eliminate on D.C. than on A.C.

Smoothing chokes in the filament circuit when using these valves are not needed, but for the high-tension supply, some form of smoothing is, of course, essential. When a smoothing choke is included some difficulty with hum may be experienced if the positive main is earthed. The hum may be set up between the valve cathodes, which will be connected to the negative main and the earthed metal screen or chassis connected to the positive main.

Most of this hum can be traced to the detector circuit, and it is well worth taking full precautions in this part of the D.C.-mains set. A great reduction in the amount of hum can be effected by enclosing the

(*Continued on page* 112)

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Parmeko Mains Transformer	1	5	0
Westinghouse A.4. 2-amp. Rectifier ...	1	19	6
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B.T.H. Minor Pick-up	1	7	6
Collaro B.30 Motor	1	13	0
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10/- **Blue Spot 44R,** magnetic type, incorporating 66/R Unit in oak cabinet. Cash Price £2/12/6. Or DOWN and 6 monthly payments of 8/-.

12/6 **Epoch 101E Energised Type Moving-coil Speaker,** for 6-12-volt accumulator or 2-amp. charger. Unit only. Cash Price £6/15/-. Or DOWN and 11 monthly payments of 12/6.

7/6 **Blue Spot 66/R Unit and Major Chassis.** Cash Price £2/10/-. Or DOWN and 6 monthly payments of 8/-.

17/6 **Epoch 99K de Luxe Permanent Magnet M/C,** chassis only, with 4-ratio transformer. Cash Price £7/7/-. Or DOWN and 9 monthly payments of 16/-.

16/6 **B.T.H. Senior A.C.,** for direct connection to A.C. mains. (Chassis only.) Cash Price £7/15/-. Or DOWN and 11 monthly payments of 14/6.

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"THE PICK OF THE MONTH'S RECORDS" (*Continued from page 105*)

The King's Breakfast, 1s. 6d. **PANA 25096**
A splendid experiment by "Uncle Stanley." This whimsical thing from "When We Were Very Young" should be enjoyed by children of all ages.

Silent Night, Holy Night and O, Sanctissima, 4s. **PARLO RO20164**
Although Christmas is past, these two fine old carols will give real pleasure all the year round. Tauber sings at his best, without tricks—reverently. If I could buy only one "Tauber," this would be my choice.

Little Grey Home in the West and Where My Caravan has Rested, 2s. 6d. **COL DB662**
Two very slender ballads in the big style. There is no denying the power and quality of Aroldo Lindi's voice.

Miserere Scene "Il Trovatore" and May Angels Guard Thee "La Forza del Destino," 6s. **H.M.V. DB1199**
Ponselle, who sings with Martinelli in the first and with Pinza in the second seems to be infinitely more enjoyable in "Angels Guard Thee."

Aria of the Miller and Rondo of Farlof, 6s. **H.M.V. DB1530**
Two very jolly things by Chaliapine—in Russian, of course. It is a pity there is no translation, for the second sounds funny.

I'll Be Back and The Bootlegger's Child and Before You Ask Me to Believe You Love Me, 2s. 6d. **PARLO R1086**
If my readers want a souvenir of Ross and Sargent, this is it.

Parlez-moi d'Amour and Dans la Fumee, 2s. 6d. **COL DB673**
The first is a particularly charming little song by Lucienne Boyer. The second is not quite so good. I cordially recommend this record.

Makin' Faces at the Man in the Moon and Down Sunnyside Lane, 1s. **RADIO 1575**
Here are two typical G. H. Elliott songs—splendidly put over.

MISCELLANEOUS RECORDS

The Haunted Room, 1s. 1d. **PICC 874**
A humorous sketch which might have come straight from Savoy Hill. Good fun for a party.

The Yodelling Swiss and The Blind Girl and the Yodeller, 2s. 6d. **PARLO R1080**
A soprano and yodelling effort which makes no great impression.

Jovial Jasper and Xylophonia, 1s 3d. **STERNO 797**
Xylophone solos with band. Clever and bright, if not exactly melodious.

Haydn Wood's Song Selections, 1s. 6d. **WIN 5400**
The Commodore Grand Orchestra and Organ do a real Cinema turn. A splendid performance.

By the Swannee River and Gold and Silver Waltz, 1s. 6d. **WIN 5405**
The Commodore again. Altogether first rate.

"RECORDER."

"USING THE NEW D.C. MAINS VALVES"

(*Continued from page 110*)

detector valve, its screen, and such components as the grid leak and condenser, in a special screening box, which should be connected to the detector cathode and *not* to earth.

The accompanying circuit diagram shows a typical three-valve set for use with the new Osram or Marconi D.C. valves. It will be seen that in addition to the detector and its associated components the following low-frequency transformer is included in the screen. Note particularly that the negative mains lead starts at one side of the detector valve heater, which is in series with the other two heaters in the manner shown.

As it stands, this arrangement of detector screen may give rise to instability, due to the fact that it is not at earth potential. Also it does not conform to the I.E.E. regulations regarding shock precautions. This difficulty can be entirely overcome by surrounding the detector screen connected to the cathode with another slightly larger screen, connected to earth. The two screens should be connected together with a small condenser.

Another source of hum has been traced to the use of a choke-capacity output circuit, particularly when a pentode is used as shown by the diagram. The remedy here is obvious—use an output transformer.

Interference due to switching on the D.C. line can often be prevented by the inclusion of the high-frequency chokes shown in the mains leads. The value of these chokes should be not less than 25 microhenries.

If these precautions are taken, and the circuit is properly decoupled as shown, there is no reason why a set with D.C.-mains valves should not give as hum-free reception as an A.C.-mains set.

"COLUMBIA FOUR-VALVE CONSOLE"

(*Continued from page 108*)

being the first stations actually quite clear of local interference. I found that London National had a spread of not more than 20 metres, which is up to standard for a set not fitted with band-pass aerial tuning.

I was able to separate adjacent high-power foreign stations without any trouble; as an example, I should like to mention that I got Lengenberg, North Regional and Prague clear of one another—no mean feat for three high-power stations.

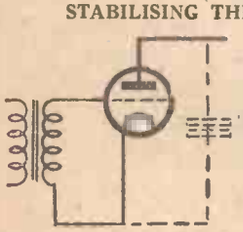
On the long waves the selectivity is, I think, rather above the average, as I got Zeesen quite clear of Daventry and Radio Paris, save for a faint side-band "twitter" on occasion. Six of the long-wavers came in at fine strength.

The volume control, as already indicated, controls the sensitivity of the screen-grid valves, and for the reception of most stations there was power in hand.

Quality on the self-contained moving-coil pleased me, as I think it would most readers. There is enough top to give brilliance to music and enough bass without boom to give depth to the overall tone. The loud-speaker takes considerable volume without distress. Gramophone-record reproduction is very much worth while on this set—which incidentally forms the basis of the new Columbia automatic-record changing radio-gramophone selling at 47 guineas.

SET TESTER.

STABILISING THE L.F. SIDE



In portable sets and others where the layout is exceptionally compact, one does sometimes have trouble with stray H.F. currents getting into the low-frequency side of the set. This will be obvious by poor tuning, difficult reaction and, in some cases, low-frequency oscillation. To cure this, fit a small fixed condenser with a value of about .0001 microfarad between the anode and filament of the first low-frequency valve. The same arrangement may be tried in some detectors.

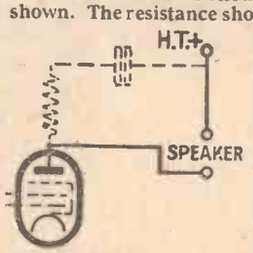
"GANGED" TUNING

IT may happen when ganging a dual-range tuner that the coils will match on the medium waves, but not on the long, so that in order to keep the condensers in step on both sides of the wave-change switch it becomes necessary to trim or reduce the value of one of the coils. The obvious way of doing this is, of course, to remove a few windings, one at a time, until both condenser readings agree; but a neater method of securing the same effect is to wind one or two turns of insulated wire around the coil in question and to connect the two ends together. The auxiliary wire then acts as a short-circuited secondary to lessen the inductance of the main or primary winding.

B. A. R.

WHEN USING A PENTODE

If, when you fit a pentode in place of an ordinary power valve, the tone is reedy and there is no bass, then you need a filter circuit across the speaker to by-pass some of the high-note response. A condenser and a resistance in series should be connected as shown. The resistance should have a value of about 5,000 ohms and a flexible resistance may be used. The condenser should have a value of about .01 microfarads. The higher the value, the greater is the high-note cut-off.



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Don't Forget to Say That You Saw it in "A.W."

A POPULAR concert will be relayed from Kingsway Hall on January 23 in the National programme. The Central Band of the Royal Air Force will be conducted by Flight-Lieut. R. P. O'Donnell.

Shakespeare's *Taming of the Shrew* will be in the National programme on January 29.

Listeners who have not yet heard the feature programmes of John Watt's "Songs from the Shows" should make a point of tuning in to the sixth of the series, which is to be broadcast on January 21, bearing the title of "The Theme Song."

An outside broadcast arranged for the morning of January 29 is the Rectorial Address given from St. Andrew's Hall, Glasgow, to the students of Glasgow University. The speaker is Mr. Compton Mackenzie.

A Salvation Army service will be relayed from the Congress Hall, Clapton, in the National programme on January 17.

Mary Maddock will be heard with the Western Studio Orchestra on January 25.

A running commentary on the International Ice Hockey Match between England and Canada will be relayed from the Park Lane Ice Club in the Regional programme on January 18. The commentator is to be Mr. George F. Allison.

Father C. C. Martindale is to broadcast a series of talks bearing the general title of "What is a Saint?" These will be given on Sunday afternoons and will take the place of the Bible readings.

The City of Birmingham Police Band is to give a concert in the Town Hall on January 27, which will be broadcast to Midland listeners.

A feature programme entitled "Folk Songs and Dances" has been arranged by the Midland Studio Orchestra for January 28.

Dance music by Peter Fielding and his Band from the Town Hall, Cheltenham, will be followed by a vaudeville relay from the Hippodrome Theatre, Birmingham, on January 29. The vaudeville show is timed to begin between 8 and 8.30 p.m.

Harold Williams and Berkeley Mason are the soloists at a concert to be given by the Gloucester Orpheus Society from the Shire Hall, Gloucester, on January 28.

Regional vaudeville on January 18, and National on January 19, will include Edith Day, Robert Naylor, Mario Lorenzi, Dorothy McBlain, Scott and Whaley, and Alec McGill and Gwen Vaughan.

Four types of "theatre music" will be broadcast by the B.B.C. Theatre Orchestra in the London Regional programme on January 18.

A Black Country play by Frank Layton, entitled *The Invalid*, will be broadcast from the Birmingham studio on January 25.

The North Regional programme on January 17 begins with a pianoforte recital in the Leeds studio by Muriel Richardson.

The series of talks "We Northerners" continues on Monday, January 18 with a broadcast by Miss F. Holdon.

The Abram Colliery Prize Band will provide the North Regional concert on January 19.

On January 20 the "Lancashire Mummers" make their first appearance in the North Regional programme. This concert party is the Lancashire reply to the "Yorkshire Mummers," and the rivalry between the two parties is expected to be keen!

The City of Birmingham Orchestra has engaged Frederick Dawson, the well-known pianist, for its Plebiscite Concert on January 30.

THE STAR SET OF THE SEASON STARS LISSEN COMPONENTS!

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LISSEN FIXED CONDENSER - - 1/-
LISSEN GRID LEAK 1/-
LISSEN FIXED CONDENSER - 1/-
LISSEN "HYPERNIK" L.F. TRANSFORMER 12/6
LISSEN DISC-TYPE H.F. CHOKE - - 2/-
LISSEN TERMINAL BLOCKS - 1/- each
LISSEN TERMINAL BLOCK - - - 1/-

The LISSEN

HYPERNIK TRANSFORMER

The designers of the Ether Searcher have used this transformer in the actual set because *they could not get such a good response curve*—such fine quality of reproduction—*from any other transformer at anything like this price.*

With a primary induction of fully 100 henries, it yet operates perfectly when passing currents up to 5 mA. or more. Its step-up ratio is 4 to 1, and a stage amplification of more than 100 is obtained.

PRICE **12/6**

BUILD IT WITH LISSEN AND GET BEST RESULTS

You don't want to build another three-valve set unless you are going to get really *exceptional* results . . . and that is just what the designers of the 1932 Ether Searcher have tried to provide for you. Now it's up to you—ARE YOU GOING TO GET THE BEST POSSIBLE "ETHER SEARCHER" RESULTS BY PUTTING IN THE BEST POSSIBLE COMPONENTS? All the fixed condensers . . . LISSEN! Two Lissen H.F. Chokes! The transformer . . . LISSEN, of course! Triple-gang three of the fine new rigid Lissen Variable Condensers. Use Lissen Valveholders, Lissen Spaghetti Resistances, Lissen Reaction Condensers—don't be satisfied with "second-best" but think for yourself about this circuit and get all Lissen—THE PARTS THAT PULL TOGETHER!

LISSEN disc-type H.F. CHOKE

A disc-type H.F. Choke of outstanding merit, in very compact form. Will operate perfectly in any capacity reaction circuit wherever an H.F. Choke is specified. Suitable for both long and medium wavelengths. Will give perfect results in receivers employing Dual Wave Coils. PRICE **2/-**

LISSEN FIXED CONDENSERS

These Lissen Mica Fixed Condensers are leak-proof. They never vary. They deliver all their stored-up energy. Guaranteed accurate within 5 % of marked capacity. Can be mounted upright or flat. Grid-leak clips included free with each condenser. .0001 to .001 .002 to .006, 1/6. **1/-**

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It is of utmost importance that resistances should be unvarying in value and free from defects which may cause parasitic noises. Lissen Resistances have been tested by exposure to rain and sun, and they remain constant and silent in use always. All values **1/-**

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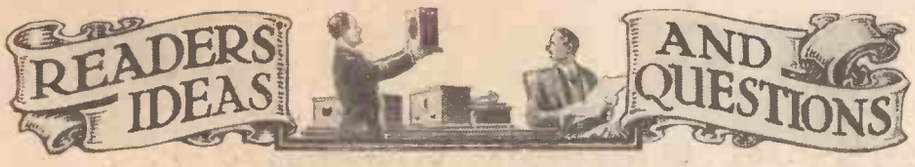

The Anglo-American Radio Society

SIR,—In June of 1931, the Anglo-American Radio Society, owing to the world depression, abolished membership fees, and anyone desiring can now join freely. All that is necessary for a person desiring to join is to send his name and address to the headquarters of the society at 11 Hawthorn Drive, Willowbank, Uxbridge, England, and he will be enrolled.

Members may obtain free help and information regarding receivers, components, stations, etc., for the asking. They will, if desiring it, also be put in touch with members in all parts of the world.

As the society has no funds, members, and those applying for membership, who desire a reply are asked to kindly enclose a stamp.

The aims of the A.-A.R.S. are to aid radio enthusiasts and to promote goodwill and fellowship between nations.

ERNEST HOBDEN
(Enrolment Council Member of A.-A.R.S.).

"We Show the Way"

SIR,—I read with interest Thermion's comments under "We Show the Way" in current issue of AMATEUR WIRELESS. He says we certainly taught America how to make valves and dull emitters in particular, or words to that effect. I am 100 per cent. British, but do not think that this country can claim a monopoly of radio brains. For the past two years I have been writing valve manufacturers to find which one produced a special detector, guaranteed free from microphonic noises when used for short-wave reception. The answers are evasive and unconvincing. America and Holland do produce a valve of this description.

A. W. M. (Middlesbrough).

Trolley-bus Interference

SIR,—We have succeeded in getting the Ipswich Branch of the W.R.A. to take the matter of trolley-bus interference up with a view to bringing more pressure to bear on the Tramway Corporation and other parties concerned.

If this is not asking too much, we should be very much indebted if you would publish the above as a news item in your valued paper, as we feel sure that Ipswich readers of your publication will be very much interested, also it will stimulate interest among the traders themselves.

IPSWICH WIRELESS COMPANY, LTD.
(Ipswich).

The "Century Super"

SIR,—I have been particularly interested in letters which have been printed in AMATEUR WIRELESS concerning the "Century Super." I have always been interested in super-hets from the time they were first introduced, and have stuck to them despite the nonsense that has been written and spoken as to the inferior quality that was to be expected from them. The "Century Super" beats the whole lot and, in my opinion, is the very best set that has yet been introduced. I have departed from the original design by putting in a 30-ohm rheostat to govern the filament current to the two S.G. valves and to act as a volume control, a 2-megohm leak for the second detector and two stages of L.F.— Hypermu transformer in the first stage, and a Telsen "Ace" in the second, with a Mullard 254 power valve. The set is driven by a home-made eliminator with five tappings and the loud-speaker is a 24-in. and 18-in. double linen cone with the latest Blue Spot unit. With the rheostat the volume can be regulated from a mere whisper to a deafening roar—the potentiometer being about a quarter on for the English stations.

The tone is excellent both on the bass and high notes and the set is generally admired.

J. H. C. (Hutton).

A Matter of Screening

SIR,—I have been trying to build up a set which combines a number of features. I did not keep rigidly to any one particular design because none of them incorporated all of the features I wanted. The task of actual building has been finished some weeks, but the results are far

(*Continued in 3rd column of page* 118)

OUR LISTENING POST

By JAY COOTE

I FEEL convinced that, during the last week or so, in the space of a few nights more transatlantic broadcasts were logged than at any other period of the year. Between 2 and 4 a.m. the U.S.A. stations simply rolled in. Even modest three-valvers offered to their owners readable signals from KDKA East Pittsburgh (306 metres); WJZ, Boundbrook (394.5 metres); WBZ, Springfield (303 metres); WPG, Atlantic City (273 metres); WTIC, Hartford (283 metres); WTAM, Cleveland (280 metres); WIOD, Miami Beach (230.6 metres); WGY, Schenectady (380 metres); and most correspondents commented on the extraordinary volume of transmissions picked up from the main Columbia Broadcasting station, WABC, recently moved to Wayne Township (New Jersey) and now a full 50-kilowatter.

On larger sets of the super-het type many of the smaller stations were also well heard. Fortunately, most of the U.S.A. transmitters work on wavelengths corresponding almost to those of well-known and easily found European stations. All that is needed, therefore, is to tune in to one of these, go to bed early, rise again at, say, 2 a.m., and carry on. It means a very short search over a few degrees of the dial. You will be surprised to find how easily these transatlantic concerts can be picked up during the present month.

English Transmissions

Radio Paris on every Sunday now brings us a series of sponsored programmes which do much towards brightening the broadcasts usually available on that day. The French station is on the air with gramophone records as early as 11 a.m., and with but one interval between midday and 1 p.m., when a French broadcast is made, supplies a continuous *English Performance* until 4 p.m. In the latter hour, devoted to H.M.V. productions, the announcements have been personally made by our old friend Rex Palmer, of the earlier B.B.C. days; in the same way, Mr. Christopher Stone in the flesh, officiates in the studio for the Decca Hour. Again, at 10.30 p.m. the French station reappears with a further hour's entertainment for British listeners offered by a London weekly publication.

Regularly every Saturday well-known radio stars cross the Channel to appear for one night only in the Paris studio. Flotsam and Jetsam, Leonard Henry, Norah Blaney, and Gwen Farrar have already contributed to these broadcasts, and I understand that other equally famous artistes have been engaged for future concerts.

Radio Toulouse

Radio Toulouse still retains its English transmission every Sunday at 10.40 p.m. and Radio Normandie, at Fécamp, which, for the special purpose of reaching listeners on this side of the "ditch," has adopted a more favourable wavelength of 246 metres, makes a regular appeal to Great Britain every Sunday evening. From this studio at 7 p.m. the first transmission is made, and at 10.30 p.m., after its regular programme, the station again takes the air with special entertainments for our benefit. On these nights it is seldom that the announcer is allowed to sign off before 3 a.m. It must be borne in mind that the Fécamp transmitter normally works on 220 metres (more or less!) and changes over to 246 metres only at 10.30 p.m. for these concerts.

Judging by my mail-bag, in the beginning of the week it seems evident that English broadcasts from France are greatly appreciated on this side of the Channel, but I should like to know what the French listener thinks of them. Sunday, in most countries, is the only day which gives the average working man an opportunity of using his receiver. The Frenchman, rightly enough, expects understandable programmes from his station, and his thoughts regarding these "angleeche" comic songs should prove enlightening. There are, as a matter of fact, on every Sunday eleven sponsored transmissions from French stations specially destined to listeners in the British Isles.

READERS' IDEAS AND QUESTIONS

(*Continued from page* 116)

from satisfactory. My chief complaint is instability. J.B. (Lewisham).

When designing a receiver, it is essential to guard against electro-magnetic or inductive coupling. All coils, whether H.F. tuning coils or H.F. chokes or H.F. or L.F. transformers, should be arranged so that the plane of their windings is at right angles to those nearest them. If it is impossible to arrange your set of components in this way you will need to experiment with damping in your different circuits to overcome any instability.—ED.

Statistics recently published in Holland show that at the end of September, 1931, there were 278,891 registered listeners to the broadcast programmes; these entertainments were also received by 414,438 subscribers to the recently established wired-wireless systems working in conjunction with the telephone services.

Pantomimes from the Theatre Royal, Leeds, have become regular annual events for Northern listeners. This year *Dick Whittington and his Cat* will be relayed from 7 to 9 p.m. on January 21.

When Submitting Queries . . . . . .

Please write concisely, giving essential particulars. **A Fee of One Shilling** (postal order), a stamped addressed envelope, and the coupon on the last page must accompany all letters. The following points should be noted.

Not more than two questions should be sent with any one letter.

The designing of apparatus or receivers cannot be undertaken.

Modifications of a straightforward nature can be made to blueprints, but we reserve to ourselves the right to determine the extent of an alteration to come within the scope of a query. Modifications to proprietary receivers and designs published by contemporary journals cannot be undertaken.

Readers' sets and components cannot be tested at this office. Readers desiring specific information upon any problem should not ask for it to be published in a forthcoming issue, as only queries of general interest are published and these only at our discretion. Queries cannot be answered by telephone or personally.

Readers ordering blueprints and requiring technical information in addition, should address a separate letter to the Query Department and conform with the rules.

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Think of it, the famous Celestion M.12 Chassis for 8/- down and 4 monthly payments of 8/-.

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Postcard Radio Literature

GET THESE CATALOGUES FREE.

Here "Observer" reviews the latest booklets and folders issued by well-known manufacturers. If you want copies of any or all of them FREE OF CHARGE, just send a postcard giving the index numbers of the catalogues required (shown at the end of each paragraph) to "Postcard Radio Literature," "AMATEUR WIRELESS," 58-61, Fetter Lane, E.C.4. "Observer" will see that you get all the literature you desire.

A Useful Free Book

I REALLY think every set constructor should have on hand a copy of the new Lissen book. Lissen's, as you know, manufacture practically every radio part, from batteries to terminals, and you will find them all in the new lists—complete sets, too. Copies will be sent free through my Catalogue Service. Constructors should note that Lissen parts feature in the "1932 Ether Searcher" described this week. **677**

Loewe Parts

You should write for a free copy of Catalogue 31/32, issued by the Loewe Radio Co., Ltd. Resistances, condensers pick-ups, loud-speakers, and multiple valves are described. **678**

A Bulgin Catalogue

The new Bulgin book is more than a catalogue, for some thirty pages are devoted to circuits and pictorial diagrams for switches, volume controls, and dozens of other useful components. In the first part of the manual the leading components in the Bulgin range are illustrated and described. **679**

From Ferranti

List R.C.B. 2 has just come to hand from Ferranti, Ltd. This includes everything from rejector wavetraps to radio gramophones. A section is devoted to meters and testing instruments. **680**

Short-wave Gear

The "Eddystone Kilodyne Special" is described in a new 1932 folder from Stratton and Co., Ltd. This is specially designed for short-wave working, but also gives broadcast band reception. **681**

OBSERVER

Set users who are in doubt about the efficiency of their earth connection should get details of the Wearite earth tube which makes it an extremely easy job to get a low-resistance earthing point. These tubes are of guaranteed solid copper and cost 3s. 6d. each. Details can be obtained, free on mention of AMATEUR WIRELESS, from Messrs. Wright & Weaire, Ltd., 740 High Road, London, N.17.

HEARING THE MAINS

ONE of the interesting exhibits at the Physical and Optical Society's exhibition was an H.M.V. display shown by the accompanying photograph. With this it is possible

to hear the note set up by the frequency of the electric supply mains. The lamp in the centre, which is connected to an A.C. supply, projects a beam of light on to a photo-electric cell on the right. This is connected to an H.M.V. S5 moving-coil speaker.

"Amateur Wireless and Radiovision." Price Threepence. Published on Thursdays and bearing the date of Saturday immediately following. Post free to any part of the world: 3 months, 4s. 6d.; 6 months, 8s. 9d.; 12 months, 17s. 6d. Postal Orders, Post Office Orders, or Cheques should be made payable to "Bernard Jones Publications, Ltd."

General Correspondence is to be brief and written on one side of the paper only. All sketches and drawings to be on separate sheets.

Contributions are always welcome, will be promptly considered, and if used will be paid for.

Communications should be addressed, according to their nature, to The Editor, The Advertisement Manager, or The Publisher, "Amateur Wireless," 58-61 Fetter Lane, London, E.C.4.

BROADCAST TELEPHONY

Broadcasting Stations classified by country and in order of wavelengths. For the purpose of better comparison, the power indicated is that of the carrier wave.

Metres	Kilo-cycles	Station and Call Sign	Power (Kw.)
GREAT BRITAIN			
25.53	11,751	Chelmsford (G5SW)	10.0
242.3	1,238	Belfast	1.0
261.5	1,147	London Nat.	50.0
288.5	1,040	Newcastle	1.2
288.5	1,040	Swansea	0.12
288.5	1,040	Plymouth	0.12
288.5	1,040	Edinburgh	0.3
288.5	1,040	Dundee	0.12
288.5	1,040	Bournemouth	1.0
288.5	1,040	Aberdeen	1.0
301.5	995	North National	50.0
309.9	968	Cardiff	1.0
355.8	843	London Regional	50.0
376.4	797	Glasgow	1.0
398.9	752	Midland Regional	25.0
480	623	North Regional	50.0
1,554.4	193	Daventry (Nat.)	30.0
AUSTRIA			
218.7	1,375	Salzburg	0.5
245.9	1,220	Linz	0.5
285.2	1,052	Innsbruck	0.5
352.1	852	Graz	7.0
453.2	666	Klagenfurt	0.5
517	581	Vienna	15.0
also testing on 1,237 m. from 7.0 p.m. (Mon., Wed., Sat.)			
BELGIUM			
206	1,456	Antwerp	0.4
208.3	1,440	Liége	0.15
215.3	1,393	Chatelineau	0.2
216	1,389	Liége	0.1
216	1,383	Bruxelles Conference	0.2
219.7	1,365.6	Binche	0.1
240.8	1,245.8	Liége	0.1
244.9	1,225	Schaerbeek	0.2
273	1,095	Radio Cointe	0.4
280.2	1,071	Brussels (SBR)	0.5
338.2	887	Brussels (No. 2)	15.0
509	590	Brussels (No. 1)	15.0
BULGARIA			
318.8	941	Sofia (Rodno Radio)	1.0
CZECHO-SLOVAKIA			
249.6	1,201.8	Prague (2)	5.0
263.8	1,137	Moravska-Ostrava	11.0
279	1,076	Bratislava	14.0
293	1,022	Kosice	2.5
341.7	878	Brunn (Brno)	34.0
488.6	614	Prague	120.0
DENMARK			
281.2	1,067	Copenhagen	0.75
1,153	260	Kalundborg	7.5
ESTONIA			
296.1	1,013	Tallinn	12.0
468.8	640	Tartu	0.5
FINLAND			
291	1,031	Viipuri	13.2
368.1	815	Helsinki	13.2
559.7	536	Tampere	1.0
1,796	167	Lahti	54.0
FRANCE			
220.3	1,361	Béziers	0.5
222	1,351	Fécamp	5.0
245.9	1,220	Sunday after 11.0 p.m.	
237.6	1,261.2	Bordeaux-Sud-Ouest	2.0
249.6	1,202	Juan-les-Pins	0.5
255.1	1,176	Toulouse (PTT)	1.0
266.4	1,126	Lille (PTT)	1.3
271.5	1,105	Rennes	1.2
280	1,049	Montpellier	2.0
287.3	1,044	Radio Lyons	30.0
294.6	1,018	Limoges (PTT)	1.0
304.9	984	Bordeaux (PTT)	13.0
312.6	960	Natau-Vitus (Paris)	0.5
317.3	945.4	Marseilles	1.6
327.5	916	Grenoble (PTT)	2.0
328.9	912	Poste Parisien	1.2
345.2	869	Strasbourg (PTT)	11.5
368.4	813	Radio LL (Paris)	0.5
384.4	779	Radio Toulouse	8.0
447.1	671	Paris (PTT)	0.7
466	645	Lyons (PTT)	1.5
1,445.7	207.5	Eiffel Tower	13.0
1,724.1	174	Radio Paris	75.0
GERMANY			
19.73	15.226	Zeesen	15.0
31.38	9,560	Zeesen	15.0
217	1,383	Königsberg	1.7
217.5	1,370.9	Flensburg	0.5
227.4	1,319	Cologne	1.7
227.4	1,319	Münster	0.6
227.4	1,319	Aachen	0.3
232.2	1,292	Kiel	0.31
239.4	1,253	Nürnberg	2.0
245.9	1,220	Cassel	0.3
253	1,184	Gleiwitz	5.0
259.3	1,157	Leipzig	2.0
269.8	1,112	Bremen	0.2
276.5	1,085	Heilsberg	60.0
283	1,060	Magdeburg	0.6
283	1,060	Berlin (E)	0.6
283	1,060	Stettin	0.6
318.8	941	Dresden	0.3
325	923	Breslau	1.5
360.6	832	Mühlacker	60.0
372	806	Hamburg	1.5
380.6	770	Frankfurt	1.5
419	716	Berlin	1.5
453.2	662	Danzig	0.5
472.4	635	Langenberg	60.0
532.9	563	Munich	1.5
559.7	536	Kaiserslautern	1.7
559.7	536	Augsburg	0.3
556	530	Hanover	0.3
569.3	527	Freiburg	0.25
1,634.9	183.5	Norddeich	10.0
1,634.9	183.5	Zeesen	60.0
2,525	119.3	Königswusterhausen (press)	15.0
2,900	103.5		
4,000	75		
HOLLAND			
298.2	1,006.1	Huizen	8.5
299.5	1,001.3	Radio Idzerda (The Hague)	3.0
1,056.3	284	Kootwijk (testing)	10.0
1,071.4	280	Scheveningen-Haven	10.0
1,875	160	Hilversum	8.5
HUNGARY			
550	545	Budapest	23.0
ICELAND			
1,175	255.4	Reykjavik	10.0
IRISH FREE STATE			
224.4	1,337	Cork (6CK)	1.2
413	725	Dublin (2RN)	1.2
ITALY			
80	3,750	Rome (3RO)	50
247.7	1,211	Trieste	10.0
273.6	1,096	Turin (Torino)	7.0
312.2	961	Genoa (Genova)	10.0
318.8	941	Naples	1.5
331.5	905	Milan	7.0
368.1	815	Bolzano	1.5
441	680	Rome (Roma)	75.0
501.7	598	Florence (Firenze)	30.0
542.5	553	Palermo	3.7
LATVIA			
525	572	Riga	15.0
LITHUANIA			
1,935	155	Kaunas	7.0
NORTH AFRICA			
363.4	825.3	Algiers (PTT)	13.0
416	721	Radio Maroc (Rabat)	10.0
NORWAY			
235.5	1,274	Kristiansand	0.6
240.2	1,249.2	Stavanger	0.6
364	824	Bergen	1.35
367.6	816	Frederiksstad	0.8
453.2	662	Porsgrund	0.8
493.4	608	Trondheim	1.2
580	517.6	Hamar	0.8
1,091.7	274.8	Oslo	60.0
POLAND			
214.2	1,400	Warsaw (2)	1.9
234	1,283	Lodz	2.2
312.8	959	Cracow	1.5
334.4	897	Poznan	1.9
380.7	788	Lvov	16.0
409.8	732	Katowice	14.0
495.8	605	Wilno	21.5
1,411.8	212.5	Warsaw	120.0
PORTUGAL			
290.5	1,033	Lisbon (CT1AA) also on 42.9 m.	2.0
ROMANIA			
394	761	Bucharest	12.0
RUSSIA			
424.3	707	Moscow-Stalin	100.0
720	416.6	Moscow (PTT)	20.0
937.5	320	Kharkov (Rv20)	25.0
967.7	310	Alma-Ata	10.0
1,000	300	Leningrad	100.0
1,034.5	290	Tiflis	10.0
1,116	268.5	Moscow-Popoff	75.0
1,170	256.4	Taschkerit	25.0
1,304	230	Moscow (Trades Unions)	165.0
1,481	202.5	Moscow	100.0
1,600	187.5	Irkutsk	15.0
1,910.8	157	Sverdlovsk	20.0
SPAIN			
253.3	1185	Barcelona (EAJ15)	1.0
268.9	1,115.5	Valencia	5.0
348.8	860	Barcelona (EAJ1)	8.0
368.1	815	Seville (EAJ5)	1.5
409.8	732	Madrid España	2.0
424	707	Madrid (EAJ7)	2.0
454.6	660	San Sebastian (EAJ8)	0.6
SWEDEN			
230.6	1,301	Malmö	0.75
257	1,167	Hörby	10.0
306.8	977	Falun	0.65
321.9	932	Goteborg	10.0
435.4	689	Stockholm	55.0
541.5	554	Sundsvall	10.0
770	389	Ostersund	0.6
1,230.5	242	Boden	0.6
1,348.3	222.5	Motala	40.0
SWITZERLAND			
244.7	1,226	Basle	0.65
246	1,220	Berne	0.5
403	743	Söttens	25.0
459	653	Beromuenster	60.0
TURKEY			
1,204.8	249	Istanbul	5.0
1,538	195	Ankara	7.0
YUGOSLAVIA			
307	977	Zagreb (Agram)	0.75
430.4	697	Belgrade	2.5
574.7	522	Ljubljana	2.5

PREPAID ADVERTISEMENTS

Advertisements under this head are charged THREEPENCE PER WORD, minimum charge THREE SHILLINGS. DEPOSIT SYSTEM

As the Publishers cannot accept responsibility for the bona fides of advertisers in this publication, they have introduced a system of deposit which it is recommended should be adopted by readers when dealing with persons with whom they are unacquainted. It is here explained.

Intending purchasers should forward to the Publishers the amount of the purchase money of the article advertised. This will be acknowledged to both the Depositor and the Vendor, whose names and addresses must necessarily be given. The deposit is retained until advice is received of the completion of the purchase, or of the article having been returned to and accepted by the Vendor. In addition to the amount of the Deposit, a Fee of 6d. for sums of £1 and under, and 1s. for amounts in excess of £1, to cover postage, etc., must be remitted at the same time. In cases of persons not resident within the United Kingdom, double fees are charged.

The amount of the Deposit and Fee must be remitted by Postal Order or Registered Letter (Cheques cannot be accepted), addressed to "AMATEUR WIRELESS" ADVERTISEMENT DEPARTMENT, 58/61 FETTER LANE, LONDON, E.C.4

BRYCE'S Renowned Mains Transformers and Chokes, from 15/-. Approved by "Amateur Wireless" and "Wireless World."—Bryce's, 54 Dawson Street, Bury, Lancs.

ELIMINATOR COMPONENTS for home constructors. Stamped addressed envelope brings Eliminator Diagrams, with prices of complete range of mains components.—Mains Power Radio, Broadway Works, Eastern Road, Romford, Essex.

HEADPHONES.—Sullivan's Double Headphones, two receivers with metal headbands, 120 ohms, 3/- pair; ditto, 8,000 ohms, 4/- pair. Field service headphones, leather headbands, I.R., English make, 2/6 pair; clean, and boxed in makers' cartons. Single earpieces, L.R., 1/6. All new and guaranteed 2 years. Microphone insets, 2/-. 9-lb. parcel useful oddments, 6/-, post free.—Electradix Radios, 218 Upper Thames Street, E.C.4.

CHARGE YOUR H.T. FROM YOUR L.T. AT HOME.—Combination trickle. Charges efficiently 1 to 12. H.T. 10-volt accumulators, 10/6. Postage 6d. Diagram only, 1/6. —R. Fox, 188 Camberwell Grove, S.E.5.

INVENTOR'S POCKET-BOOK. How to patent. Invaluable aid to selling your ideas. Expert advice. Copies free. —Edwin G. Axe, A.I.M.E., 27 Chancery Lane, London.

MOVING-COIL SPEAKERS.—Various makes, from 10/- to 30/-, with input transformer. Brand new. 6 to 240 volts. A.C. or D.C., and P.M. Write Plater, 92 Umfreville Road, Harringay, N.4.

BUY BRITISH.—The "Tonic" Self-generating Trickle-charger Kit enables everybody to keep their 2-volt L.T. accumulators fully charged at home. Ideal for remote places. Obtainable only from maker, 7/- each; postage 9d. —Williams, Netherend, Cradley, Birmingham.

KITS.—"Britain's Super," £6; "Century Super," £3/15/-; "Comet Three," £2/2/-; G.E.C. "Victor Three," £1/13/6. "Britain's Super Two" Valve Set, complete with valves, batteries, speaker, £3/12/-. Anything wireless supplied at keenest prices. Send your lists of requirements for quotation.—Servwell Wireless Supplies, 74 Gough Street, London, E.14.

BANKRUPT STOCK.—Few Amplion M.C.6 Units to be cleared at 50/-, carriage paid. C.O.D. Guaranteed new and unopened.—123 Choumert Road, S.E.15.

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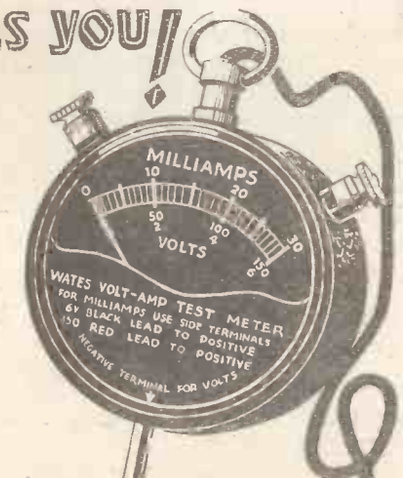

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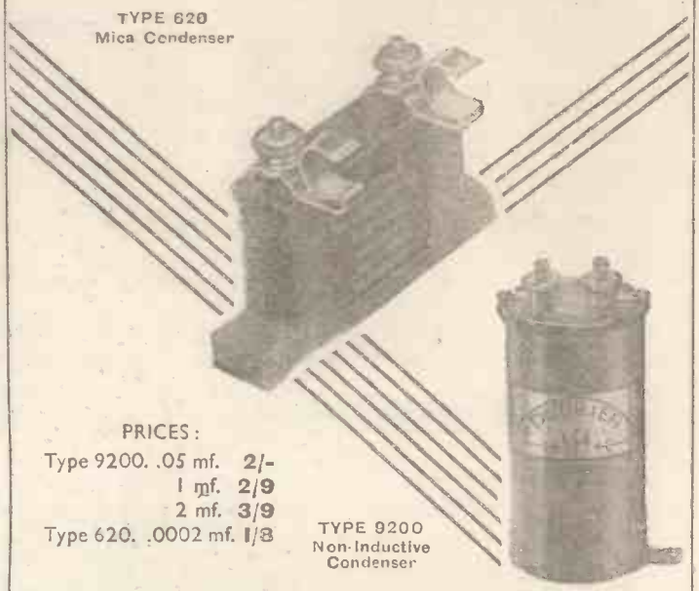

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