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Amateur Wireless and Radiovision

3d Every Wednesday

WE ANNOUNCE THE FIRST CONSTRUCTOR CRUSADERS' STAR SET

FREE BLUEPRINTS FOR ALL MEMBERS

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NEW SEASON'S NEW IDEAS

Also in This Issue

- Secrets of Police Radio
- Earths for Better Signals
- There's Fun in Morse!
- New Television Inventions

Vol. XXV. No. 635 Registered at G.P.O. as a newspaper August 11, 1934

THE RADIO OF THE FUTURE

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It does not matter how much or how little you have in mind to spend, you will find, in the "His Master's Voice" range, the set that is *exactly* what you want. "His Master's Voice" instruments range from £7. 19. 6 upwards, and each, at its price, is the finest set you can get for your money anywhere. Come and see the new models "His Master's Voice" are showing at Olympia. Very *audibly* are they in advance of their time.

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A set for every purpose—to flatter every purse

STAND Nos. 61 & 33, THE RADIO EXHIBITION,

OLYMPIA, AUGUST 16th—AUGUST 25th

"HIS MASTER'S VOICE"

THE GRAMOPHONE CO. LTD., 98-108 CLERKENWELL ROAD, LONDON, E.C.1

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News and Gossip of the Week

The Show

FIRST impressions of the Show permeate this issue—the first of three special numbers devoted to all the latest in radio.

Our next issue will be a bumper one—with crowds of articles and pictures that will provide an invaluable guide to what to see at Radiolympia.

August 16 to August 25—radio at Olympia—Radiolympia!

In Full Swing

NO more striking evidence of the effects of the Show could be provided than the picture on our cover—depicting the immense activity at the well-known Hollinwood factory of Ferranti, Ltd.

And so it is with other leading firms. Full speed ahead for Autumn deliveries of the latest radio sets and components and accessories!

Crisis Radio

DURING the recent crisis in Vienna the broadcasters of Europe were all on their toes providing latest news. The B.B.C.'s Listening Post at Tatsfield was specially busy, relaying the Vienna station to Broadcasting House, as well as other European broadcasters as required.

Vernon Bartlett Again

IS it not significant that the B.B.C. called upon Vernon Bartlett for a commentary on the first European crisis since he left the corporation?

Speakers on foreign affairs have come and gone in the past few months and, while several have been very good, none has enjoyed quite the same confidence with listeners as Vernon Bartlett.

Asking Him Back?

TO cover the Vienna trouble the B.B.C. sent Vernon Bartlett over there by air.

His broadcasts from the Austrian studio showed that his style has lost none of its old appeal. Some day the B.B.C. will wisely ask him to come back into the fold.

Good Night, Vienna!

WHAT is an important sidelight on the crisis is the ban imposed at Broadcasting House on any reference to Vienna in the variety programmes.

No mention is allowed in song or patter and the edict rules out such popular numbers as "Good Night, Vienna."

When politicians interfere with entertainment ridiculous sequels are inevitable, of course.

Unfriendly Action!

YET because broadcasting has become such a potent propagandist instrument a jocular reference in a variety lyric might easily by construed as an "unfriendly action" by a foreign power—if not as an actual cause for war.

America Calling!

JACK HYLTON returns to the microphone on September 13 and 14 when his band plays in "America Calling"—another of those "cod" American radio programmes arranged by the irrepressible Eddie Pola.

It is only a coincidence that this date falls in the week Jack Payne refused after a little argument about fees.

All listeners will be disappointed we are not to hear Jack Payne, by the way—but he knows his business best.

Droitwich On the Air

WHEN the Press witness the switchover from Daventry to Droitwich on September 6 the new giant long-waver will radiate its first official programme to listeners.

Probably the Belfast Orchestra will have the distinction of opening the new station but after half an hour there will be a switchback to Daventry.

Full Service

FOLLOWS a period of sliding-in wherein the Droitwich station will take over first of all the late dance music, gradually replacing Daventry in all the programmes, so that by the end of September Droitwich will be doing all the programmes that now go out from Daventry.

So will come to an end the by no means inglorious days of Daventry—a station that will be mourned as much by Continental listeners as by ourselves.

Good For Trade!

WHAT a joy it will be when the glaring gap in B.B.C. programmes from 11 to 12 in the mornings is filled!

The trade especially ought to welcome the increased service, for it will enable sets to be demonstrated more adequately than has been possible in the past.

Big Programme Changes

BUT a much more important change is coming in the programmes later in the autumn.

October 8 is the date that has been chosen to introduce full alternative programmes right through the day from 10.30 in the mornings until 11.15 or even 11.30 at night.

Grand news—more details later, listeners.

"Technical Hitch"

EVIDENTLY the Germans did not like the tone of R. H. S. Crossman's talk, which was to have been relayed from a Berlin studio. At the last minute "trouble in the microphone circuits" was given as an excuse for not putting Crossman through to London.

B.B.C.'s Resource

FORTUNATELY, the B.B.C. was quite ready for something of this sort. Some hours before they arranged for the talk to be phoned to London and from there it was read without waiting for an explanation of the "hitch."

By the way, the lines from Berlin to London were tested and found perfectly in order *just before the talk was due*.

D.-G.'s Cruise

FOR the first time since he joined the Corporation twelve years ago the Director-General is taking a *real* holiday—a cruise to South Africa.

Generally he takes a house by the sea within easy reach of Broadcasting House.

Apart from a business visit to America for the opening of Radio City he has never been away from his office for more than a few days at a time.

SOS!—

BROADCAST S O S messages on foreign stations are not nearly so common as over here but when they are sent out the results are sometimes staggering.

At 4.7 the other day a broadcast request was issued by Brussels for a certain drug needed by a sufferer from meningitis.

—Answered!

BY 4.9 several offers of the drug had been received by the broadcasters, a Red Cross car had set out with a supply and an aeroplane was ready to take off with some more on board.

The patient got the dose in good time—and thanks were later on broadcast.

Fox photo

Not a job we envy! Here you see a mechanic ascending one of the Rugby station masts for his daily inspection. The lifts going to the top of the 820-ft. masts can carry three people, the journey taking 12½ minutes—but it seems very much longer

This is the new Peto-Scott Adaptagram cabinet—1935 version! One of the most popular and useful cabinets available to the home-constructor!

Constructor Crusaders' Corner

For the Free Interchange of Practical Radio Ideas

ALREADY our Crusader members are beginning to mould set-designing tendencies, to fashion the radio of the future, to help us in our unending search for ever-improved reception facilities.

Alternative Outputs

Among those who are crying for alternative output arrangements we might quote Constructor Crusader 1160. He starts off thus:

"I should say the average home-constructor is not in a position to know exactly what is best, as he has not the necessary equipment at his disposal to test all the newest ideas, so he has to leave it to a paper like "A.W." to guide him.

"I should like to try a set with two high-frequency stages. I would like the output to be class B—for this reason: last year I built your class-B three, with which I am well satisfied. For its good quality and volume I like it better than a lot of all-mains sets I have heard being demonstrated in dealers' shops. Of course, having no high-frequency it will not bring in many distant stations without distortion.

"If I built a set using pentode output I should have to discard all that equipment and get new output parts. Would it be asking too much for you—if you are intending to design a 'two high-frequency' set with S.A.V.C.—to make it up with two or three alternative types of output—say pentode, class B, and Q.P.P.—so that it would appeal to a larger number of constructors."

Well, now, that is typical of the sort of thing we are receiving from Crusaders.

CC1160 and other Crusaders will therefore welcome the news given on page 129 about our first Star set—the Crusader AVC4; for in this set we have engineered three different outputs as required by so many readers.

◆ ◆ ◆

Don't forget that all Crusader members will be able to apply for the blueprint of the AVC4 free of charge—just one of the many advantages of membership.

Similarly, with all the other Star sets of the season, dates for which have already been published. Free blueprints to build your Crusader sets, and then free advice on any little technical points that may arise after you have done the constructional work.

◆ ◆ ◆

Some amateurs still seem to think that free blueprints and technical advice on Star sets is all the Crusade has to offer. Actually these facilities are but a side line of the main issue—which, as you see from the sub-heading—is the free interchange of practical radio ideas.

By free interchange we mean absolute freedom of expression on your part—and ours—relating to all the problems that arise in amateur set building.

Shaping Design Policy

We want you to feel that you have a powerful and effective voice in shaping design policy through the medium of the Crusaders' Corner.

Now is your chance to air those pet theories you have so long harboured! Now is the time to frame proposals for the star sets of the coming season—because, of course, we shall be largely guided by what our members say when we come to the next three designs.

◆ ◆ ◆

On looking through our correspondence we find that there are many outstanding controversies still to be settled by the Crusaders. It might be a good idea to line them up for your immediate consideration.

(1) Do you want baseboard-and-panel or chassis sets?

(2) Separate tuning condensers or gang condensers?

(3) All-wave sets or sets for short waves separate from those designed for ordinary broadcasting?

(4) Mains sets with self-contained power packs or separate supplies?

(5) Loud-speakers built into the cabinet or connected separately in external cabinets?

THE PRIVILEGES OF MEMBERSHIP

1.—*Every Constructor Crusader will receive a full-size blueprint immediately on publication, of each of the four star sets to be described in "Amateur Wireless" during the 1934-35 season. These sets will be released on August 15, October 3 (1934), and January 23 and March 13 (1935).*

2.—*Every member will also be entitled to free technical advice in connection with any or all of the four special Crusader sets mentioned above (each query must be accompanied by a stamped and addressed envelope for the reply). In the case of queries regarding any other "Amateur Wireless" sets the usual rules of the Information Bureau must be observed.*

3.—*All Constructor Crusaders are invited to contribute ideas and suggestions to the Constructor Crusaders' Corner. Constructive suggestions will be specially helpful and will be interpreted by the "Amateur Wireless" Technical Staff as far as possible to the advantage of all set builders.*

4.—*Immediately his application for membership has been approved every Constructor Crusader will receive a certificate of membership. Note that the membership number must be quoted in all future correspondence.*

5.—*Constructor Crusaders will be authorised to wear the badge of membership. Badges for buttonhole wear can be obtained for 1s. extra each, post paid.*

To Constructor Crusaders, "Amateur Wireless,"
58-61 Fetter Lane, London, E.C.4.

(Enclose in envelope bearing 1½d. stamp.)

Please enrol me as a member of the Constructor Crusaders. I enclose postal order for 1s. to cover postage on four free blueprints and office expenses (and also an extra 1s. for buttonhole badge). It is understood that I shall be entitled to free technical advice on any matters concerning the four free blueprint sets. My name and address are:*

August 11, 1934

Value of Postal Order Enclosed	For office use only.			
	No.	C	B	L
.....				
*Delete if not required				

He Thought the Policeman Was Deaf!

"Body-line radio" has been perfected in this country for the policeman on his beat. It is now possible for the Brighton police headquarters to call up any one of thirty or more policemen—who carry with them lightweight and entirely invisible wireless receivers. With these they listen in comfort to instructions issued from "H.Q." In this exclusive AMATEUR WIRELESS article ALAN HUNTER explains the whole system as developed for the police during the past four years by an English engineer

Topical photo

Not deaf, as a visitor wanting the Palace Pier imagined, but listening intently on his radio outfit to "H.Q." at Brighton

NOT long ago a visitor to Brighton went in search of the Palace Pier—there are two piers down there, you know. He, like all self-respecting Englishmen when in doubt, asked a policeman.

"Sh!" enjoined Robert, and immediately clapped to one of his ears a sort of telephone.

Nonplussed for a moment, the visitor, collected himself, and then, with both hands to his mouth: "Can you tell me the way to the PALACE PIER?" he screamed.

Topical photo

Another side-light on Brighton's police radio. A "mobile" gets a "hurry" message from headquarters!

Robert had to smile. For he had been listening to a call on his radio outfit at the moment the visitor had approached him. And, as you will agree, it *is* rather amusing to think of a *deaf* policeman.

Because, naturally, Robert was very far from deaf. Indeed, his ears were more closely attuned to the, er, criminal under-world than any policeman in history.

With his "body-line radio" he was in constant touch with the Brighton police headquarters, from which point instructions could be instantly transmitted by wireless telephone.

I have been chatting with the man who has worked on the Brighton police radio equipment for the past four years. His name is C. L. P. Dean, an electrical engineer who long ago realised what a tremendous aid wireless could be to police forces.

Quietly and without any "ballyhoo" this enterprising young engineer has been developing one of the most remarkable wireless receivers in the world.

That its efficiency is beyond question is obvious when you realise that over thirty policemen in the Brighton area are now equipped with "body-radio" installations, and that between 18 and 20 calls a day are sent out to them from the headquarters transmitter.

Talking of efficiency, it is interesting to compare the results of nine month's working at Brighton with similar experience in New York. Over on the other side, where the phrase "Calling all cars" is as common as "oke," the police-car radio efficiency is about 50 per cent.—taking number of calls received to those sent out. At Brighton an efficiency of 98 per cent. has been achieved.

Unofficially the police-radio system there has been in operation for over four years—officially for only nine months.

When I looked at the flat, black, bakelite case containing the police set I marvelled at the ingenuity of the design. Tom-thumb components surround midget valves. The case measures 6 in. by 4½ in. by 1⅛ in. Complete with the batteries, the set weighs only 1¾ pounds.

As might be expected, the circuit is a super-regenerative arrangement, working on a frame aerial no bigger than the dimensions of the case. Incredible? Well, you should just hear it in action—that is all I can say.

At 10 miles from the transmitter signals on this little set are perfectly intelligible—remarkable when you realise that the power of the transmitter is only 50 watts at the valve's anode. The wavelength is, of course, in the official police band around 147 metres.

Inside the little case is the two-valve set, complete with low-frequency transformer, quenching coils, and so on. This fits into one section, leaving ample room for the little two-volt accumulator and the cells of the 45-volt high-tension battery.

Everything has been specially made to measure—naturally. There is nothing in the set that could not quite easily be made on a commercial basis—as far as I could see.

So much for the set itself. It is carried wherever the policeman fancies—in his tunic pocket, hip pocket, or even on a belt. The weight and size are so small that it is never a burden—except perhaps when the shade temperature is over 80 degrees—but then so is the tunic!

The Calling Device

Then there is the calling device—a neat little affair consisting of an earpiece, a bell, and an extremely sensitive relay. This relay is operated by the carrier wave of the transmitter, and rings the bell to draw the policeman's attention to the message.

Robert then presses a button to stop the bell ringing and plugs in his phone to hear the message. The set is, of course, "on" the whole time, otherwise it would be impossible to call up the police at a moment's notice.

You may think this is very extravagant. Consider a moment, though, the current taken by the super regenerative two-valver; 1 milliampere of high-tension current and .1 ampere of low-tension current.

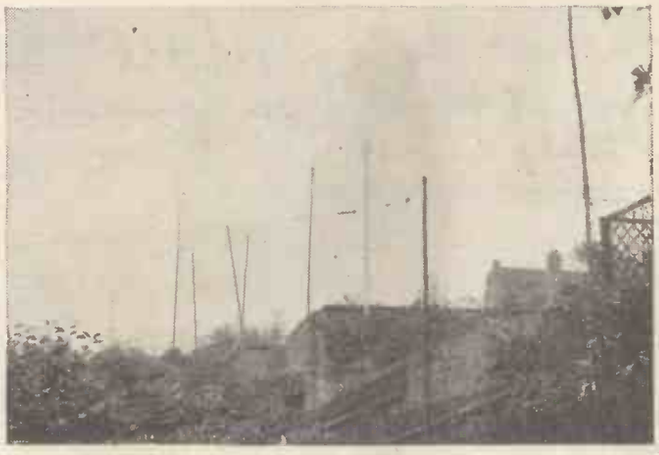
"GTN test call all patrols! GTN closing down!" That is the message going out from "H.Q." at Brighton three times a day, early in the morning, in the afternoon and at night.

What Brighton police are doing to-day all the police forces of the country will probably be doing very soon. The authorities have wakened up to the vital value of radio in the detection of crime, and are encouraging forces elsewhere to adopt latest radio methods.

Thieves have learned to their cost that radio is their most deadly enemy. At Brighton, stolen cars—and even overcoats—have been restored to frantic owners within a few minutes of their loss.

Just to show you how compact is the police-radio outfit developed for the Brighton force we have photographed the complete receiver and calling device against a standard Post-Office telephone

These Earths Mean Better Signals!



Chandler photo

Funny picture for an article on earths, isn't it? Yes, but rather appropriate, we think. Because without a good aerial the best of earths cannot do itself justice. Now laugh that off!

IN the long run the moderate-powered set's ranging properties come back to the old question: "How good—or bad—is that earth?"

Ask yourself this searching question. *Now* is the time—when stations are beginning to come back to old strength, when new sets and circuits are waiting to be tried out, when new long-distance records are in process of being compiled.

Is your earth as good as it *ought* to be? That is the question. It ought to be as good as possible—unless you have something particularly super in the way of super-het sets. For "threes" on *any* wavelength and for short-wave sets below 100 metres a really good earth is a *sine qua non* of first-class results.

Yet how many amateurs are blithely content with a roughly made connection to the water-pipe—often enough not even to a main pipe? How many inadequate buried earths are there masquerading as sound contacts?

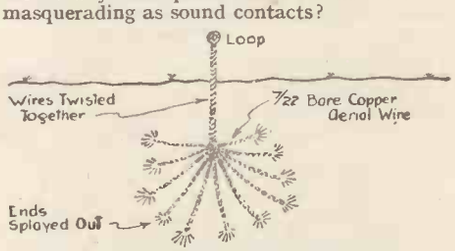


Fig. 1.—Not the finest earth in the world—but a lot better than many. It consists of any number—not less than six—lengths of 7/22 stranded wire twisted together with the ends splayed out

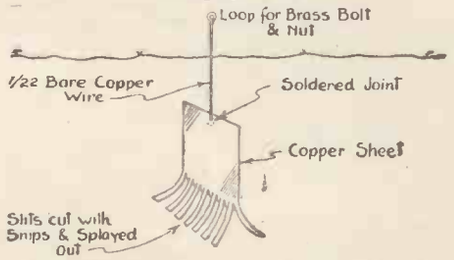


Fig. 2.—Spreading contact is the secret of good earthing. Here the area of contact by the copper sheet with Mother Earth is spread out by splaying the ends

Far more than we should like to think about. And yet it is so simple, so cheap, and so *worth while*, to put down a first-class earth.

Perhaps the fact of the matter is we have been taking the knowledge of good earthing too much for granted. If so, we are rendering good this omission with the present line up of buried copper earths.

Granted, there may be plenty of other systems of earthing that give good results, such as pipes and tubes. Granted, too, that some water pipes give really good results, and that for ultra-effective short-wave reception the counterpoise is hard to beat.

But to come back to the plain, simple, and fully tried buried-plate earth—there are plenty of ways and means.

Our pet earthing expert has been busy trying out some of his more insistent theories—and he reports that there is nothing to touch a really *well-buried*-plate—so long as it is *well spread out* and *deeply sunk*.

Knowing how much easier it is to dig a foot deep hole than to make a real excavation into the bowels of the earth, our expert has evolved some ingenious methods of counteracting the inferiority of shallow plates.

But we go too fast. Take a look, please, at Fig. 1. Here is the most makeshift earth we know that can claim to give good results. It is made up of a few lengths of ordinary 7/22 stranded-copper wire—the bare sort, not enamelled.

Just plait the various lengths for a foot or so, and then splay out the ends, as shown. You will see that at the top is indicated a loop—but don't rely on a very lasting contact with the earth lead unless you can make an exceedingly tight pressure contact with a nut and bolt. Better, though, to solder the earth lead to the loop—then you will have no fear of oxidisation.

Next comes the simple copper sheet earth,

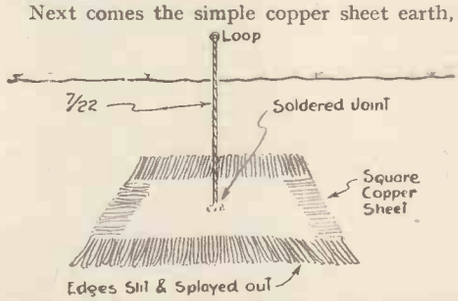


Fig. 3.—Horizontal earth where a deep hole can be dug, with the four edges splayed out to spread the contact

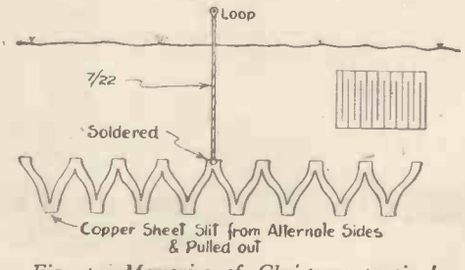


Fig. 4.—Memories of Christmas parties! Alternate slits on each side of a copper strip will make a good expanded earth. It needs a soldered lead, though

buried a foot or so in a vertical position, as shown by Fig. 2. Slit the lower end of the sheet copper and splay out the strips thus formed to increase the area of contact. Ordinary snips can be used—or even shears.

You must solder the contact between the

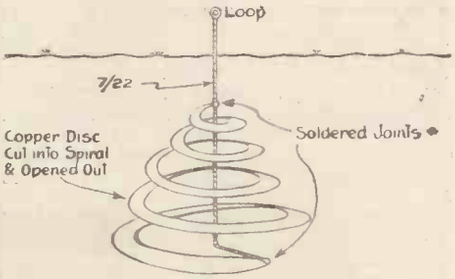


Fig. 5.—Yet another opened-out earth, this time a copper disc cut into the form of a spiral and then pulled out. Note the double soldered contacts

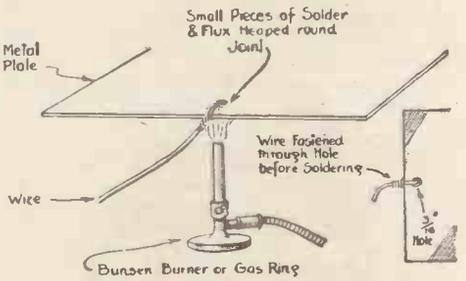


Fig. 6.—Hint for making a really good soldered joint between earth lead and plate. Important point is use of burner or gas ring for heating instead of soldering iron

sheet and the lower end of the earth lead, as this joint will be in contact with the earth and will quickly deteriorate if only made by pressure.

You can please yourself about the rest of the earth lead. Either make one continuous length of the lead from the plate to the set, or, if you want to use thicker wire for the lead than for the short buried connection, make a soldered joint above the ground. Although it can be argued that a good pressure contact will last a long time, we ourselves would not be very happy about it after, say, a month.

If you can go a fair way down—three or four feet—a horizontal earth plate is a very good idea. Especially if, as shown by Fig. 3, you slit the four edges with snips and splay out the resulting strips. A good soldered joint at the centre of the plate is essential—the rest of the lead follows the argument already made.

Now we come to something quite out of the ordinary—an earth made from a strip of copper. The copper is slit up each side alternately, as shown by our Fig. 4 diagram, so that when all the slits have been made you can pull out the strip "paper-chain" fashion—as you often do with coloured paper for decoration purposes at Christmas parties.

With the minimum of material you can thus

Continued on page 138

Looking Forward to Olympia

Once again Thermion, our popular contributor, takes a look at the Show prospects. He finds evidence from a preliminary survey of much detailed development, as distinct from the "stunting" of preceding years. He finds a parallel with the motor trade—and suggests radio is settling down.

Shades of the 1933 Show! This was one of the "latest" then—but you should just see what the 1934 Show has to offer you!

"Advances can still be made in details—and important details, too—but we seem to have reached the limit in certain directions . . . we shall find that moderately priced sets this year are of two kinds only—the super-het with from four to six valves and the straight with two or three."

FOR many reasons the Exhibition, which will open at Olympia on August 16, is going to be one of the most interesting that we have ever had. It's not going to be full of thrills, so far as I can see; in fact, I have heard of very few things of what we may call a startling nature that are likely to be seen.

Where, then, is this special interest that I have been talking about?

I don't want to overdo the already rather hard-worked parallel between the development of the motor-car and that of the wireless set, but there are one or too things common to the two that are worth a moment's attention.

Thirty Years Ago

Like the earliest wireless sets, the cars of thirty years ago were expensive, inefficient, complicated as regards their controls, and far from reliable. Just as the old wireless sets invariably refused to work when friends came in to hear them, so the cars of years ago always broke down when you strove to impress a pal by taking him for a drive.

As Motor Show followed Motor Show, all sorts of astonishing improvements were introduced. Cheaper cars, too, made their appearance. Then came a time when hardly any improvements were possible in the best cars except in matters of detail—and in the way of refinements. From that time, car manufacturers vied with one another to give the public more and more for its money without bringing down prices to a suicidally low level.

Radio on the Same Lines

With wireless, development has followed very much the same lines. Last year we reached a point at which no epoch-making improvements were possible in the best of commercial receiving sets, selling at fairly high prices.

Advances can still be made in details—and important details, too—but we seem to have reached the limit in certain directions.

You cannot, for instance, profitably employ a higher degree of sensitiveness than that possessed by some of last season's big sets—there is no point in pulling in minute stations hundreds of miles away if you have to use so much magnification that you also pull in the uproar caused by tiny atmospherics that wouldn't otherwise be heard at all.

Then, again, regarding the Stenode (of which we don't seem to have heard much for quite a while), it doesn't seem as if we could advantageously make sets much more selective than last year's best. Selectivity is definitely limited by sideband splash—those nasty spluttering noises when the unwanted station is transmitting speech—for which at present no cure is known.

There wasn't much wrong with the quality of the reproduction of last year's best sets, though, as Noel Bonavia-Hunt has shown us, the question of transients is one that deserves more attention than it has had in the past.

Last year, then, you could buy, if you were prepared to put down quite a bit of money, a set which gave something approaching a perfect performance on long- and medium-wave broadcasting stations.

What is going to interest us at this year's Radiolympia is to discover what has been done not for millionaires, but for the man-in-the-street like you (I expect) and (certainly) like me. We shall find that moderately priced sets this year are, to all intents and purposes, of two kinds only: the superhet with from four to six valves and the straight with two or three. By moderately priced, I mean sets costing from something under £5 to something under £20.

Let us take the superhets first of all. The class that interests me most, and I think that you will feel the same, is that whose price is from about £14 upwards. I have a fear, which I have mentioned before, that the lower-priced superhet may be too cheap to be really good.

Well, in the moderately-priced class we are going to find quite a few improvements over last year. Increased sensitiveness and better selectivity go almost without saying, but there are other things that matter quite a bit.

The first of these is second-channels. Lots of last year's medium-priced sets were far too full of second-channel squeals and whistles. These have been carefully extracted from the best of the 1934-35 medium-priced vintage.

Then self-adjusting volume control. This will be pretty well universal in these sets. It is absolutely essential nowadays for the good reception of foreign stations—and who is there who doesn't want to be able to hear foreign stations when he feels so inclined?

Visual Tuning Indicators

Next point: visual-tuning indicators. This refinement again is almost an essential in an S.A.V.C. set. You will find that it is in evidence right enough.

The last point I am going to make—though there are plenty of others—about moderately-priced superhets in general is tone control. Good tone control makes so much difference to one's pleasure in listening-in that very few superhets with any claim to distinction will be without it.

I have seen advance models of some of the new season's three-valve straights and I am very much impressed by their performances. One thing that has particularly impressed me about the best of them is the real smoothness of their reaction. Given the kind of reaction that makes the set glide almost imperceptibly into oscillation instead of plopping, there is hardly a station receivable by a superhet that a three-valver won't bring in.

About Battery Sets

One word about battery sets. Last season many manufacturers made the foolish mistake of turning out large battery sets fitted with small high-tension batteries. The results were lamentable. The purchaser found that he was in for constant and expensive renewals and the great movement, which should have brought the battery set into its own, placing it on the same footing as the mains set as regards both quality and volume, went off at half cock.

Some firms may repeat that mistake, but those who have got the grey matter to work will see that their sets fit the batteries that work them. So, too, will the wise purchaser.

With the Amateurs on the Short waves

Short-wave Conditions Are Improving

Says KENNETH JOWERS

ALL the amateur bands are worth exploring at the moment with even the most simple set. Now that the really hot weather has passed over, static has dropped off to a very considerable extent, so even the early-morning 80-metre Americans can be received without interference.

Reports from different parts of the country all prove that these better conditions are general and not confined to any particular locality. Jack Wilson of Newmains has sent me a very complete log of 14, 7, and 3.5 mega-cycle stations.

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20-metre 'phone Stations

Amongst the 20-metre phones heard were W1GBE, K4SA, Porto Rico, W3MD, W9USA the official station at the Chicago State Fair, the Cuban station CM2WV, W3XZ and W3AQC. All of these stations were heard between midnight and 0030.

W3ZX was calling the British station G6PY and was explaining that he was working duplex with another third-district station about three miles away. W3ZX was apparently relaying G6PY on five metres, and in turn relaying it to W9USA on 20 metres.

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Five-metre interest in the States is increasing and has apparently the same degree of popularity for local rag-chewing as the 160-metre band over this side. Down in Texas and in the middle west they are putting up some very good performances, 60 to 80 miles being about the average.

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The British stations, 6PY, 5BJ, 6XQ and 5BY seem to be getting over to the States very consistently. 5BJ was called by at least ten W stations in the course of twenty minutes, while K4SA mentioned that his strength was a good R6.

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PAOWJ on 40 metres has been heard very regularly this week calling G and D stations, usually at R7, while the German station D4BIA has been coming over at R6 with his new 50-watt transmitter. Have any fans missed this German?

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Early morning listeners have surely heard W1AF, W1BCT, W9GUM, and W2DCU, who were all coming over R5/7 on the 80-metre band between 4 and 6 a.m. Incidentally, a good medium-wave set will bring in a whole load of W stations usually all below 310 metres until about 6 a.m. Programmes consist of late dance music and all worth hearing.

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In the South of England, conditions are equally good. R. D. Everard of Standon, Herts, has a very complete log of some 130 stations, mainly on 20 metres. He has received a letter from W1OXDA who confirms that the call sign has been issued to the *Effie M. Morressey* and not the schooner *Mary* or *Marcey* as mentioned from time to time.

This boat is operated by Captain Robert Bartlett, who is making a trip to the Arctic Circle. Their route is direct north Cape York, to Ellesmere Land, then through Lancaster Sound, through the Fury and Hecta Straits and if possible through the Fox Channel to the Hudson Straits and back to New York. Two years provisions are on board, so they are well prepared.

Mr. Everard reports a number of stations coming in close to the amateur band between 2300 and 2400. HJB Bagota, Columbia, KAY of Manilla, TIR Costa Rica, and HPF of Panama City are consistently heard.

PRADO, Rio Bamba, Equador on 19 metres has been logged for the last two Sundays at 2230 and 2330.

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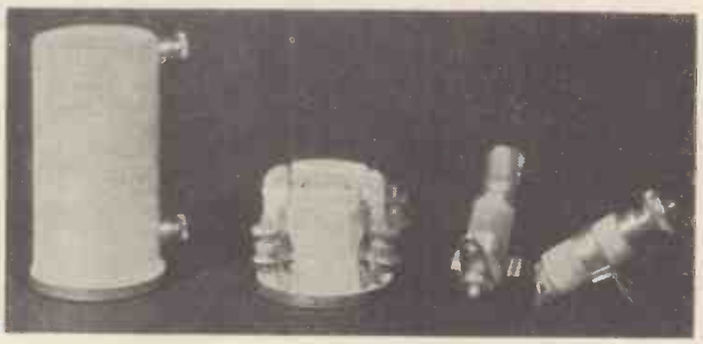
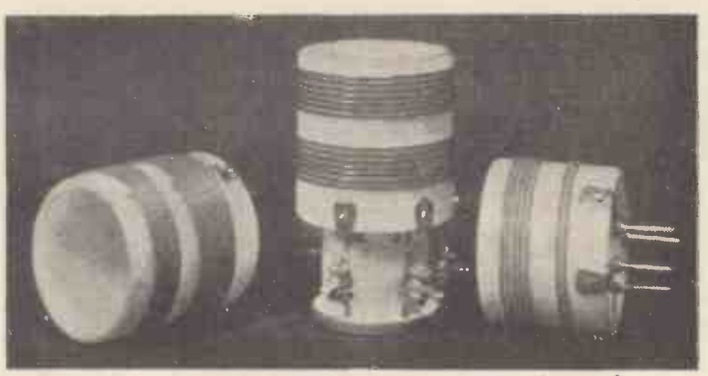
Egyptian, Spanish and Italian stations can be heard in dozens on the 40-metre band, although the English amateurs are usually crowded out.

I asked last week for reports on W9GXJ, the portable call of Bill Ingersoll W9BHT, and Mr. Everard tells me that this station has been heard several times lately at good strength. A good log is W9JGF of Denver, Colorado, who has been heard by three listeners. Although W5's and W6's come over quite well, W9's seem to be hard to hear.



Short-wave components—high-frequency-choke former, valve holder and lead-in tube—made of quartz fused at 2,000 degrees Centigrade



Set of short-wave coils wound on fused quartz formers. Note the valve-holder type of base for interchanging

Another Scottish listener, C. G. Fotheringham, has logged a number of really DX stations including PY2CD, of Brazil, CX2AM of Uruguay, BE1DG, W2ECW, W2DC, W4BCR in addition to K4SA and W9USA. He has heard no less than thirty DX stations between the hours of 2200 and 2400 on a simple two-valve receiver.

On Tuesday last he logged CP1GB of Bolivia and LU3DD of the Argentine, while the following day were heard DQ4CRP of Kenya, OM4AA. This log is exceptionally complete for such a receiver.

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East and West!

Our old friend, W. A. Clemenson, of Hampstead has sent a report which confirms my own reception. He has also been using a two-valve receiver and finds conditions very good indeed. In Hampstead at 0600 the W6 and W7 stations come in at full strength, but only when the aerial used is due East and West. Nothing can be heard when the aerial is North and South.

On 40 metres the W6 and W7 stations are still very strong, and, in addition, New Zealand, Japanese and Australian stations are to be heard. He has also heard CP1GB who is coming over rather well at the moment as well as W2EJV and W2CVM who are both with the W2DEW expedition.

Listeners who have heard these stations should send reports as they are particularly wanted by the stations in question. Mr. Clemenson has to date obtained 200 QSL cards from six continents and 71 countries including all districts in America, Canada, Cuba, Mexico, Peru, and Canal Zone.

Reception Good

Reception during the last few days has been good and includes DQ's, ZL's, W7's and 6's, PY's and CP stations, Chile and Japan. The Japanese station was J2GX using 300 watts.

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ZL2OF of New Zealand, W6AHZ and W7QC all ask for reports from European listeners. A card received from VK3MR of Victoria, shows that he uses 200 watts on 7 megacycles.

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H. H. Gent, of Harlesden, asks me to pass on a report from W4MR Greensboro, North Carolina, who is working on 28.032 kilocycles every Sunday this summer and would appreciate reports from European listeners. 28-mega-cycles stations have bridged the Atlantic, so there is no reason why W4MR should not be heard over here.

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For those who are interested in 5-metre transmission, make a note that G5MG of 34 Morton Way, N.14, will send out a series of 5-metre tests on Sunday mornings between 1000 and 1015 B.S.T. and on Monday evenings between 2255 and 2300 B.S.T.

Anybody hearing transmissions finishing with the call signs G5WW on either 2 or 7 megacycles, should make very careful note of the results and send a complete report to G5WW. This will be greatly appreciated. G5RD is well worth hearing these days on the 160-metre band and coming through at very good strength indeed. 2KT is again active on the 80-metre band and I understand before long will be on a wavelength of 20 metres.

On Your Wavelength

By Thermion

Olympia a Week To-morrow

ONLY eight more days to go before the opening of the Exhibition at Olympia! On another page in this issue I've given you my forecast of the Show, as I have done for so many years now. That being so, I won't use more "Wavelength" space for talking about Olympia, but will content myself with this reminder to make a note of the date and a resolve to come if you possibly can. You will find the AMATEUR WIRELESS stand (No. 10) well worth a visit.

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B.B.C. Stars on View

I HEAR that some scintillating star turns are being engaged by the B.B.C. for their show at Olympia. Amongst them are Clapham and Dwyer and Stainless Stephen, who are always welcome. We shall also, of course, have Henry Hall and the B.B.C. Dance Orchestra and I hope that we will be able to see as well as to hear heaps of other broadcasting favourites.

It would be an excellent idea if at Olympia the B.B.C. could stage that "Ten Years of Broadcasting" programme that they put on some months ago when numbers of the most popular broadcasting artists were before the "mike."

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Droitwich at Work

SOME of you, I expect, will already have heard test transmissions from the new Droitwich long-waver. The other night I had to sit up rather late and it occurred to me to see whether there was anything doing on 1,500 metres shortly after midnight.

Sure enough there was Droitwich going great guns.

None of your dry-as-dust test transmitting, but a really fine concert, to which I listened for quite a while.

I need hardly say that the volume was excellent. An outstanding feature of the transmission was its beautiful quality. The new Droitwich station contains almost every modern improvement and the quality of its transmissions will come as a pleasant surprise to many who have depended mainly on 5XX for their reception of the home programmes.

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Poor Old Ravag

THE Vienna broadcasting station has had rather a tough time during the past year or so. Its studios, as you probably know, are in the city and the transmitting plant is situated at Bisamberg a mile or two outside. Some time ago an attempt was made to wreck the transmitter and a good deal of damage was done by a bomb.

There was a second outrage of the kind only a few weeks since, but in that case very little harm was done. The climax came when, during the recent episodes in Vienna, the studios were occupied by rebels who succeeded in sending out a spoof announcement that the Government had resigned.

The studios were subsequently besieged by the police, and something like a pitched battle was fought in and around them.

The station has now resumed business as usual, but, as you may have noticed, the big transmitter doesn't appear to be in full working order, for reception is rather faint.

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The Stuff to Give the Mike

DID you, I wonder, hear either of the performances of A. A. Milnes' *Mr. Pim Passes By*? I hope so, for if you did you couldn't help admiring Irene Vanbrugh's beautifully clear speech.

If only some of the younger actors and actresses would take her as an example, we'd have less of the mumbling and of the clipped, slurred kind of speech which sometimes makes listening to broadcast plays a bit of a trial.

Another thing, too; unlike some of the Bright Young Things of to-day, Miss Vanburgh, when taking part in a dialogue, knows exactly how long to wait after a remark by another character before beginning her lines. She doesn't jump in too quickly or make an unduly long pause.

If only we had a few more like her!

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Dearer Licences?

IT has been hinted that when the present B.B.C. charter expires—in 1937—the cost of the P.M.G. licence is to be increased from ten shillings to £1 per year. The only apparent justification for this somewhat cool proposal is that we are at present getting our programmes so much cheaper than the Austrians, Germans, and Czecho-Slovakians. By way of consolation, we are to be offered the privilege of paying in four quarterly instalments of five shillings a time.

Now whilst I do not deny that we are getting good value for our money from the B.B.C., I would like to point out that quite a lot of other European listeners pay less than we do, whilst the Americans still get their programmes for nothing. Finally, so long as the B.B.C. can afford to hand over quite a large slice of their revenue as a "buckshee" contribution to the P.M.G., any suggestion of increasing the yearly tax on the listener should be ruled absolutely out of court.

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Hornsey and Loud-speakers

A GOOD MANY towns and districts now have by-laws against causing a nuisance by means of a noisy loud-speaker. One of the latest to frame such a regulation is the Hornsey Town Council; and a jolly good thing, too. There is no doubt that wireless is one of the jolliest things in your own home; but loud and raucous wireless in somebody else's home or garden can be pretty horrid.

One of the failings of the standard by-law is that to be effective a complaint must be made by at least three householders. In some cases there aren't three households that could suffer, and the offender can thus go on unchecked by the forces of law and order.

Whatever you do, remember your neighbours and don't be a wireless nuisance.

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Real Applause Meter

WE have heard quite a bit lately about applause-meters, but one means of gauging the success of a turn was discovered some years ago in New York.

Amos and Andy came on nightly at ten minutes past seven and the whole of the States sits down to listen.

The Bell Telephone Company, which runs the biggest land-line system over there, keeps very careful records of the volume of work that comes its way in the twenty-four hours.

Soon after Amos and Andy came on the air they found that the curve showing the amount of telephoning done made a sudden dip at 7.10 and remained at a low point until the turn was over.

America, in fact, was so busy being amused that it hadn't time to telephone

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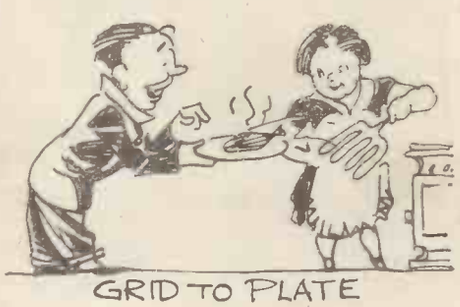
Useless Programme Lists

SOME of the lay papers, and especially those appearing on Sundays, make a point of giving their readers lists of recommended foreign transmissions. In certain cases these lists are very carefully prepared by experts who know what can be received and what can't. In others, though, they appear to be turned out by the office boy, who makes his selection by shutting his eyes and dabbing with a pencil.

One recent list, for instance, began with Prague and Vienna at 11 a.m. and contained such absurdities as Toulouse at 1.15 p.m.,

RADIO TERMS ILLUSTRATED . . . . . By OUR CRAZY ARTIST



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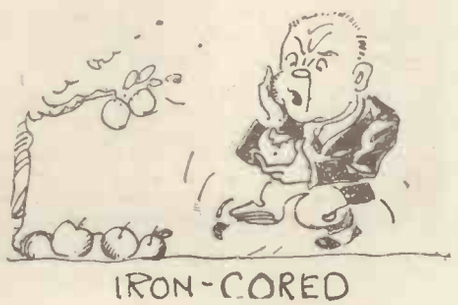
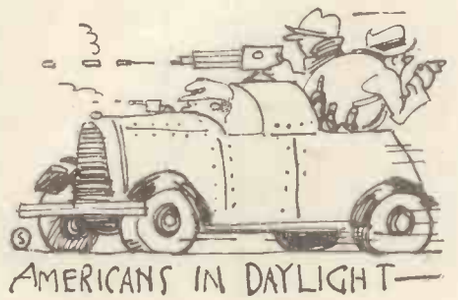


IRON-CORED



AMERICANS IN DAYLIGHT—

H.M.V. photo.

Emir of Gwandu pressing a record of the King's and Queen's voices during his recent visit to the Hayes factory. (Below): The young idea again! Modern sets are so simple that even the kiddies can tune-in the foreign stations!

Marconiphone photo

Budapest at 3.30 p.m., Bucharest at 4 o'clock and so on and so forth.

Why they cannot do the thing decently if they must do it at all I can't think. It's pretty hard on their readers, who think because they see these stations recommended they must be receivable and get worried about their sets when they cannot hear a sound of them.

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America's "Andy" Here

THE brightest particular stars of the American broadcasting firmament are undoubtedly Amos and Andy, who for seven solid years now have amused listeners in the States evening after evening.

At the present time Andy, who is really Mr. Charles S. Corrall, is in England taking his first holiday for seven years. He and Amos *are* funny over the wireless (as many short-wave fans can verify) just because they don't *try* to be funny.

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All-night Programmes

IN a very short time now you will be able to receive British programmes at any time during the twenty-four hours, so long as you are the proud possessor of a short-wave set.

Hitherto the Empire transmissions between 10 p.m. and 11 o'clock the next morning have consisted chiefly of Blattnerphoned stuff. Now the B.B.C. is forming an all-night orchestra which will come into action soon after midnight and continue broadcasting from one of the Empire short-wavers until the following morning.

A jolly good idea and an innovation which will be much appreciated in far-off parts of the Empire. Good as it is, the Blattnerphone has its shortcomings, and there is no doubt that the genuine article is better than the potted.

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What is "Scrambling"?

IF you have a short-wave set you must have picked up at one time or another queer-sounding telephonic transmissions which sounded like the moppings and mowings of lunatics.

These are scrambled speech, which is largely used in transatlantic telephony.

What happens is that after being delivered by the microphone the electrical copies of sound waves are deliberately mutilated in a certain orderly fashion so that they produce mere unintelligible noises when sent out a wireless transmissions.

You cannot, in fact, make sense of them unless you have a "descrambler" which automatically puts the waves back into their original form and makes the sounds that they produce just as clear as ever they were.

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Radio-relay Exchanges

IT was surprising to learn, from an answer given by the Postmaster-General in the House of Commons the other day, that there are now no less than 295 wireless relay exchanges in this country. If I had been asked to guess, I should have put the figure at 80 or 90 at the outside.

The total of subscribers to these, though, is not nearly so big as one would have expected. They number only 151,685, or just over 500 for each exchange.

Though some members of the wireless trade are rather bitter about these relays, I don't think that they need be much afraid of them, for their subscribers work out at less than 2½ per cent. of the licensed listeners in the country.

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They Will Have Foreigners!

THE fact that only one licensed listener in forty is a relay exchange subscriber shows how few people are content with just the alternative programmes of the Regional and National home stations.

Everybody insists on being able to receive the best foreign stations when he wants to; and

Barratt's photo

Ultra-short-wave receiver used in Marconi's latest experiments with radio-beacon-guided ships on his famous yacht, "Elettra"

very rightly, too, for there are some tophole programmes to be obtained from the Continent.

Intentionally or unintentionally, the B.B.C. is encouraging foreign listening by its present policy of putting on the same programme from *all* home stations every evening between 6.30 and 8 o'clock. If they cannot manage to provide alternatives at home, the medium-wave Nationals should be closed down at that time in order to make it easier for listeners to receive something different from abroad.

American Midget Valves

THE other day I was shown one of the new "midget" valves they are producing in America for ultra-short-wave working, and I must say it was an amazing piece of work. The glass bulb is about the size of a ha'penny in diameter and stands only half an inch high, and yet there are four separate electrodes tucked away inside it. The idea is that by using midget valves for midget waves one can get results on the ordinary type of circuit, instead of having to rely on special "dodges" for overcoming capacity leakage.

I remember once hearing a small boy ask—in the days when one could see through the bulb—why there was so much empty space inside a valve. It didn't occur to me at the time that there was any particular point in the question, but I am not so sure now I've seen what really can be done in the way of making things more compact.

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Navy Wants "Fans"

THE Royal Navy Wireless Auxiliary Reserve, consisting almost entirely of amateurs, is now four hundred strong and it wants to increase its membership, particularly in certain districts.

The kind of fellows it wants are those who know the morse code, and it is a great advantage if they already possess short-wave sets and know how they are made. The R.N. Wireless Reserve is a good show, and those who join have splendid facilities for training in short-wave wireless.

If you feel attracted, you can obtain full particulars from the Admiral Commanding Reserves, Queen Anne's Chambers, Tothill Street, London, S.W.1. You must be of British-born parents and neither younger than eighteen nor older than fifty-five.

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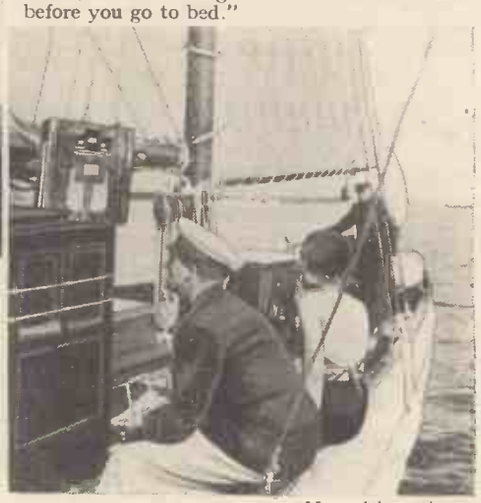
Stealing His Thunder?

THE feminine outlook on anything to do with the technical side of wireless is sometimes more—shall we say delightful—than knowledgeable. The other evening, for instance, I was at the house of a friend who shares my liking for an odd game of chess as a change from the more serious business of keeping abreast of the radio game.

As it happened the weather was distinctly thundery, so we decided to postpone a trial of his latest "hook-up" in favour of a contest of skill over the board.

Matters were moving rapidly towards a well-earned "mate" in my favour, when the door suddenly opened and my host's wife appeared. "Harold," she said, "there's a lot of thunder about, so don't forget to turn on the earth before you go to bed."



Marconiphone photo

The yachting season is now in full swing. These lucky yachtsmen have remembered to take their super-het portable with them—invaluable for weather forecasts!

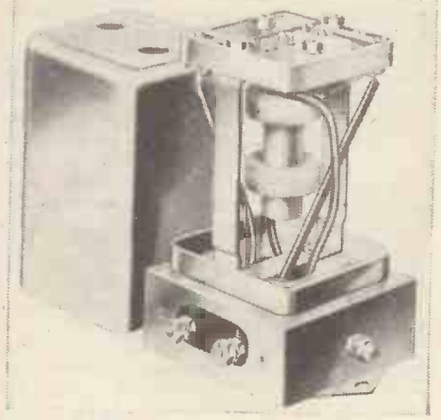
Constructor Crusaders' First "Star" Set

By the AMATEUR WIRELESS Technical Staff

FIRST fruits of the great Crusade! A straight four built up on lines that represent the consensus of opinion of a great number of enthusiastic amateur constructors.

Here it is only possible to outline the design in main essentials but next week you shall have all the working data needed to build the set for yourself.

There never has been a set quite like it. Never, that is to say, has a set evolved itself



New Telsen component that will interest Crusaders—an intermediate-frequency transformer coil tuned to 110 kilocycles by two preset balancing condensers fitted to the top

out of such close co-operative effort by reader and staff.

But enough of frothy talk. Let us, like the true Crusaders we all are, get down to brass tacks.

A straight four coming amidst a welter of super-hets may seem a little strange. There is every justification, though. For the ordinary amateur the elements of straight-four design are plain sailing. With modern valves, such as the high-frequency pentode, double-diode-triode and push-pull pentode, the straight type of set is capable of amazingly good results—free from the snags that tend to give the super-het designer brain fever in overcoming.

Super-hets later

Not that we are *afraid* to tackle super-het design. Far from it. But as our first star set in the Crusade we imagined a super-het would not truly reflect the majority demand. So we are putting off that super-het until another time.

In our straight four we have two high-frequency stages, detector and power output. The high-frequency stages both employ the latest high-frequency pentode type valves, giving really good amplification with complete stability.

Then comes the detection. But not merely that. It is a double-diode-triode. Really three valves in one. A diode for distortionless detection of the signals built up by the two preceding stages; a triode to amplify the detected signals; and a second diode for self-adjusting volume control. Then comes the output stage. Which brings us to a big point. We have been going into this question of the output stage. Opinion is extraordinarily divided. Some plump for straight pentode output, others for pentode push-pull—Q.P.P., if you like—while yet a third division are all in favour of class-B output.

So we have arranged the set's design in a way that will enable you to take your choice—without in any way upsetting the main outline of the design.

Overcoming Background Noise

Our high-frequency arrangement definitely overcomes background noise. There is, you see, no tremendous amplification on a long wavelength such as you get with super-hets. But don't think our background has been cut down by reducing amplification. Anyone could do that—but it is not design; just a "get-out."

Low Background

We have employed high-frequency pentodes in a way that gives great amplification with low background. More than that we will not say at the present moment.

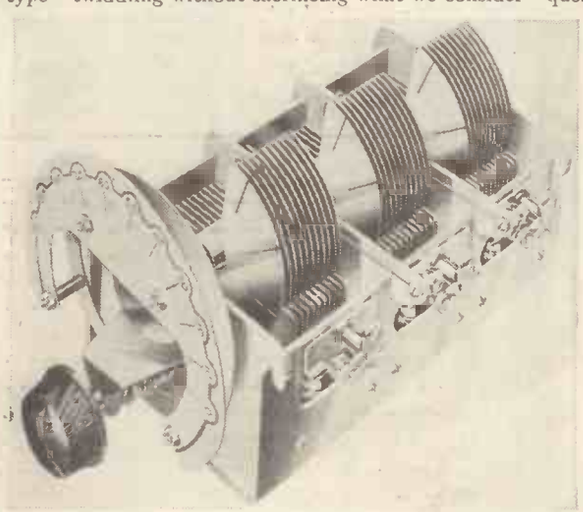
About the double-diode-triode detector stage, we might enlarge to the space of several pages. Here it will be enough to tell you that the use of this valve definitely gives us advantages that could not be obtained with ordinary triode detection.

In addition to distortionless detection—as derived from the first diode—the double-diode-triode gives us the great boon of self-adjusting volume control of the delayed type. Here is a foolproof system that levels up the volume of foreigners so that they take on the entertainment value of the home stations.

Minimum of Manual Effort

No amateur worth his salt is desperately keen to eliminate essential controls. The Constructor Crusader is not a one-knob fiend, we mean. But at the same time there is a certain luxury about being able to obtain first-rate results with the minimum of manual effort. Is that agreed?

Anyway, we have cut out unnecessary knob-twiddling without sacrificing what we consider



Another Telsen component of great value to constructors—three-gang condenser made of pressed steel, giving great rigidity. Die-castings ensuring accurate spacing

No Crusader can afford to be without some sort of testing gear. This new Avometer is a universal testing meter with no less than thirty-six different measuring ranges

are controls essential to good results. Thus you will find a single main knob controlling the tuning of three circuits, but at the same time a concentric knob provides panel trimming all round the wavelength ranges.

Then, in addition to the self-adjusting volume control, there is a manually-operated volume control, to cut down the overall strength to any desired output level.

Apart from these controls, there is just a combination switch knob for waveband changing and battery on-off action.

While controversy among Crusaders is likely to go on for quite a time over the vexed question of the position for the loud-speaker, we have taken a line of our own in this set by putting it into a separate cabinet.

You will find the set in one cabinet and in a similar-sized cabinet a good moving-coil loud-speaker. No need to stress the advantages of the separate idea—it is already well known that really good low-note response is difficult to obtain in a small table cabinet that includes the set.

Panel and Baseboard

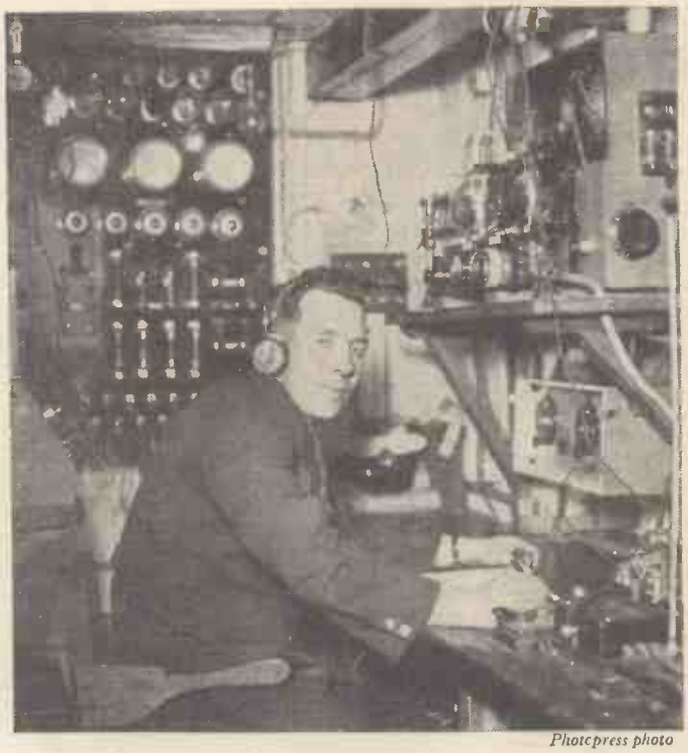
It will not surprise regular readers who have followed the ups and downs of set design to find that we have gone back to panel and baseboard methods for the main constructional design of the new set.

Amateurs who are fully aware of the virtue of the chassis-type construction for manufacturers still seem to think that, in the home, a simpler layout is desirable.

On the panel and baseboard will be found latest coils, condensers and other components—but there will be an entire absence of unnecessary "extras."

You can add extras afterwards.

There's Fun in MORSE!



Photopress photo

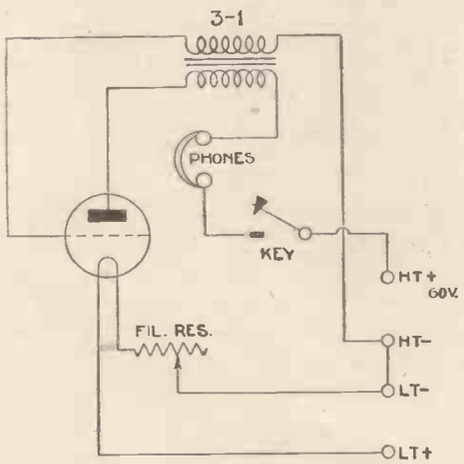
Where morse is the order of the day—the wireless room of the "Discovery." Note the morse key in the foreground

EVERY listener experiences a certain thrill when the sharp spasmodic note of the morse code bursts forth from their loud-speaker. There is always a touch of the mysterious and a fascination which very few of us can resist.

One is often inclined to let one's imagination picture ships in distress, aeroplanes off their course, messages of vital importance, and so forth. If it had been possible to translate those intriguing little "dots" and "dashes" it is highly probable that all such romance would have been shattered—but there—that is the beauty of it all—one can never tell.

Simple Method of Learning

In view of this, it is not really surprising that there is always a certain demand for a simple method of learning the morse code. To meet this we have designed a home morse instructor.



Circuit of simple morse practice gear. An oscillater valve is much more satisfactory in actual use than a buzzer

Before we talk about this, however, a few words concerning the actual code would not be amiss. If you glance at the code you will note that all the letters of the alphabet are represented by signs, formed by various combinations of a dot and/or a dash. In the case of the following letters E, I, S and H, it will be seen that these are shown as one, two, three and four "dots" respectively.

Similarly, T, M and O are one, two and three "dashes," in the order shown. From these simple letters, which, of course, are the ones you will find no difficulty in remembering, we progress to those which have dots and dashes, taking them in the order of one dot and one dash. A and N, two dots and one dash, D and U and so on until we cover all the combinations.

A great aid to memorising the code is to think of all the letters which have a reverse formation. For example B becomes dash, dot, dot, dot, while V is just the reverse, namely, dot, dot, dot, dash.

It will be found that there are many similar applications. By the way, remember that the letters A, B, V, M, P and T are always pronounced as Ack, Beer, Vick, Emma, Pip and Tock, to avoid any misunderstanding. By the time you have made the instructor you will find that you have committed to your memory quite a lot of the code.

Components Needed

From the diagram it is obvious that the actual construction will not take very long and, apart from the morse key, you will no doubt have the necessary parts in your "spares" box. The complete list of parts is:

1—Four-pin valve-holder (Clix or W.B.).
1—Intervalve transformer, ratio 3-1 (Telsen or Lissen).
1—Low-frequency valve (Cossor or Osram).
1—Morse key (Leslie Dixon).
1—Filament Resistance, 30 ohms (Igranic or Lissen).
Terminals, wire and baseboard (Peto Scott).

The filament resistance has a value of 20 ohms and its purpose is to vary the pitch of the note produced. Any old intervalve transformer having a ratio of 3 to 1 will do and should it be a type where you can remove any of the irons then do so, as you will find that the note can be made higher in pitch and more penetrating. The valve should be of the low-frequency type.

Don't be surprised to hear the signals being reproduced by your loud-speaker if you happen to be practising in the same room—especially if your set is switched on.

When to Buy Morse Keys

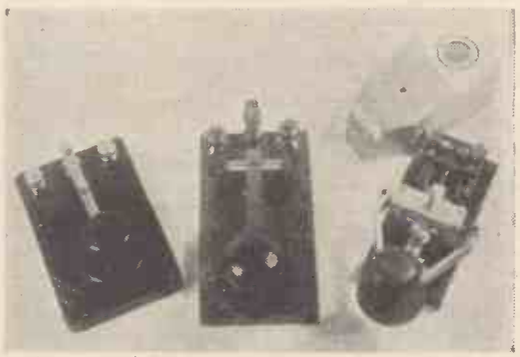
A point to note is that some little difficulty was experienced in obtaining a proper morse key until we discovered that Leslie Dixon of Upper Thames Street, carried several types in stock. Should you be able to get down to 160 and/or 80 metres with your receiver you can obtain some very fine practice at reading the code as the following transmissions will be on.

G2OI on 1,820 kilocycles at 3 a.m. G2DQ on 3,630 kilocycles at 10 a.m., and G2DQ on 1,700 kilocycles at 11 a.m. on Sunday, July 29th.

Once the alphabet has been mastered it is only a question of steady practice with the key to become proficient in sending and reading.

One of the greatest helps in this direction is to get a friend to join you in your studies. By doing this you are able to take it in turns at the key while the other has a spell of receiving.

If you are fortunate enough to possess an interested friend who lives next door or just up the road it is a very good plan to run a couple of wires between the two houses and work two stations.



A group of morse keys. That on the left is a practice key, while that on the right is for real transmission. Electradix Radio has a good selection of all types

A	·—	N	—·	1	·————
B	—···	O	———	2	··———
C	—·—·	P	·——·	3	···——
D	—··	Q	——·—	4	····—
E	·	R	·—·	5	·····
F	··—·	S	···	6	—····
G	——·	T	—	7	——···
H	····	U	··—	8	———··
I	··	V	···—	9	————·
J	·———	W	·——	10	—————
K	—·—	X	—··—		
L	·—··	Y	—·——		
M	——	Z	——··		

Here is the morse code. A dash is approximately three times the duration of a dot

In this way you are able to concentrate better apart from the element of fun which such an installation offers.

During the practice stage there is one thing you should not do. *Don't* use paragraphs out of the newspaper or any printed matter. This will only lull you into a false sense of your cleverness for the simple reason that you will be cheating . . . you will find yourself guessing half the words.

A very common fault amongst beginners in morse work is the length of the dot in relation to the dash. The usual rule is to make the dash equal to three dots while the space between parts of the same letter is one dot. *L. O. S.*

New Season's New Ideas

By way of introducing you to the galaxy of new ideas that will be on show at Radiolympia this year we have compiled the accompanying review. Members of our Technical Staff have surveyed the whole field of radio development—and in the following pages give you their first-hand impressions of the things that will really matter to amateurs during the forthcoming season. New valves, new sets, new accessories—and new low prices—all are touched upon. Next week the present necessarily general survey will be presented in greater detail—a complete Show guide!

Tune-in, as these fair listeners are doing, to the joys of new-season radio! A charming sidelight on the simple action of the new H.M.V. fluid-light portable super-het

DON'T run away with the idea that this year's radio show at Olympia—known to all keen listeners as Radiolympia—is going to be devoid of developments.

There will be just as much evidence of the progress of radio technique on August 16, 1934, as there was last year. Indeed, as far as the constructor is concerned, the developments and new ideas are more immediately of interest than ever before.

Plenty of Parts—and Circuits

This is because such improvements as self-adjusting volume control, visual tuning, combination tone control, and so on are not now confined to factory-built sets. All these ideas can be taken up by the enthusiastic amateur, thanks to the availability of excellent components and plenty of circuits to work upon.

If it is true that this year's show will be devoid of stunts and so-called revolutionary ideas, we ourselves are more than glad. It shows the trade is settling down. Not into a state of coma, but of sane development.

We have been looking through a welter of trade literature, sent to us to give a "pre-view" of the radio show that will so soon unfold itself once more at Olympia. As a result of this interesting peep into the makers' secrets, we are gratified to find how well the home constructor has been borne in mind.

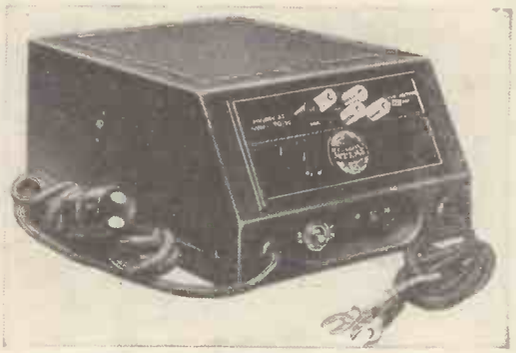
It is beginning to be realised that the keen amateur does not really want pretty-looking components, but those that do a job of work with the maximum efficiency and the minimum of unnecessary trimmings.

Stripped components for the amateur will be on show for the first time—at least in really serious quantities and variety. These parts are just as efficient as the pretty things, but they are a lot cheaper, take up less space, and altogether enable the home builder to compete on level terms with the manufacturer.

Terminals, it has been appreciated, are not always wanted. We shall see this year, therefore, a lot more parts fitted with soldering tags. In this you must remember that not merely the cost of the terminal is saved—the price is very much cheaper because the component comes into the set-maker class. It is made with factory batches, and you benefit from bulk production.

In the ranges of new stripped components there will be, among the more important developments, iron-cored coils, low-frequency transformers, and high-frequency chokes.

Among the components without terminals will be available valve holders, switches, coils, and condensers. On a three-valve set you may save as many as fifty terminals—always assuming you are prepared to undertake the perfectly simple task of soldering



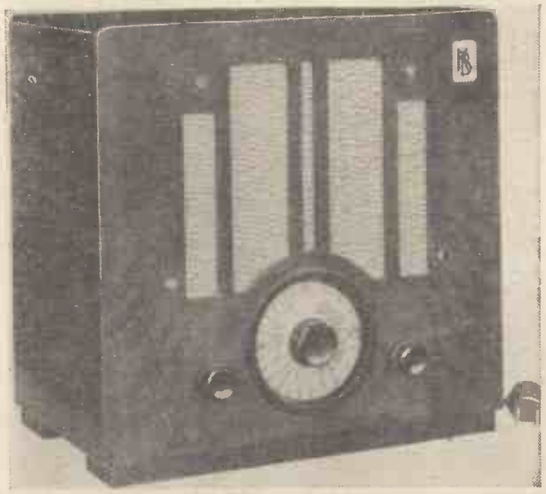
Latest Atlas Unit, model T10/30. For sets taking not more than 30 milliamperes—including class-B and Q.P.P. circuits. Unit includes trickle charger. Price £3 9s. 6d.

Specially for television sets using cathode-ray tubes—a Siemens Full O' Power battery, Price £1 10s.

Of interest to battery users—the new Cossor 210SPT battery high-frequency pentode

Remember that this is only the first of three special Exhibition numbers! It serves as a prelude to an exhaustive review of all the worth-while developments of the year. Special articles are in course of preparation to explain just how the technical advances affect YOU. As always, the articles will be eminently readable, taking you behind the scenes without muddling you with abstruse radio technicalities

An 8-stage super-het—the new Ekco model 85, in either walnut or black and chromium bakelite cabinet, with interchangeable tuning scale. For A.C. mains



Kolster Brandes Universal five-valve super-het table set with circular tuning dial—the set works equally well on A.C. and D.C. mains

connections. Electric soldering irons will be available in many makes. They are cheap to run and render soldering a quick and effective job.

Dealing for a moment with the other side of the picture, and reviewing some of the major developments among sets, we are again impressed with the enhanced appearances on all sides. Cabinet work seems to be going more and more out of the hands of the radio set maker and into the legitimate channel of the furniture designer. One maker actually employed an architect to produce a series of cabinets, into which the sets were engineered.

Coloured Bakelite

Coloured bakelite mouldings have enabled some very artistic-looking sets to be produced. With these colours you can arrange to match your radio to your furnishing scheme—and at last the radio installation can become part of the room instead of being an intrusive eyesore.

Perhaps the greatest single development among sets is the universal mains type. Last year no well-known maker was showing sets for either A.C. or D.C. mains at will. Although we realised that this type of set was bound to come we were not quite prepared for the wholesale change of front by the set makers.

Apparently the reason for this swing-round is that the valve makers have stepped in with really efficient universal valves, with characteristics actually as good as, if not better than, their A.C.-mains counterparts. This sort of thing is bound to help towards the goal of standardisation. By next year it is quite feasible to suppose that the ordinary low-voltage A.C. and D.C. valves of the separate-function type will have disappeared altogether in favour of the 13-volt universal valve.

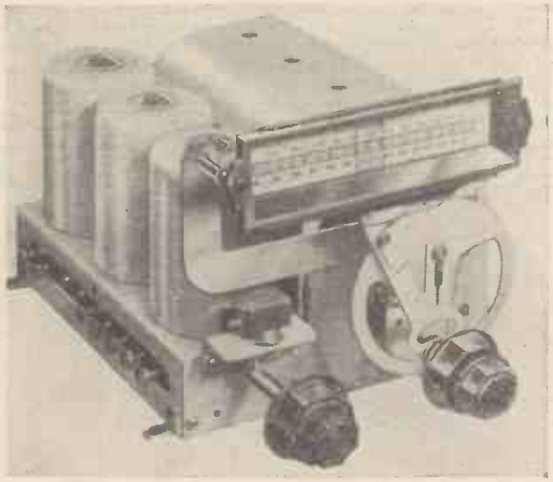
Valve Developments Fashion Set Designs

Here we have an excellent illustration of the way valve developments fashion set-design tendencies.

Incidentally, the 13-volt filament valve of the universal mains type has definitely come to the rescue of the car-radio designers. This year there will be several really excellent sets designed for the car that in every way are as good as the indoor family set. They run from the accumulator of the car, which feeds the filaments direct and drives a small rotary converter for the high-tension supply. The tendency is to do away with remote control and to have the receiver and all the controls, with the loud-speaker, beneath the facia board.

Some of these car-radio sets have a plug for an extension loud-speaker so that when the car is stationary, as at a picnic, for example, you simply plug-in and extend the speaker wherever you want it—without your being tied to the car.

The No-Mast Aerial!



One of the Jackson gang! The Linacore type BPU with three screened coils and three-gang condenser

As most of the ordinary family sets are of the super-het type this year, with selectivity pushed up to the limit, some form of visual tuning has become almost essential. It is widely adopted in many of the new productions.

Although all visual-tuning devices are used for the same object—that is to denote the accurate tuning-in of any wanted station—there are many ingenious systems for producing the effect. One is a variable light, another an expanding and contracting shadow. Still other makers favour some sort of miniature tube, which gives off a pink glow that varies in its intensity as the tuning point is passed. Then, again, a simple meter is used for visual tuning. All such systems aim to make tuning-in stations on super selective sets a simple process for the non-technical listener.

Visual Tuners

Incidentally, all the different types of visual tuner that matter can be obtained by the amateur for inclusion in home-constructed sets.

Dealing with other aspects of the latest commercial sets, we might explain that as self-adjusting volume control has been made possible by using battery or mains-operated double-diode triodes, these valves are incorporated in almost all the larger sets.

Here is the well-known Milnes supply unit, a high-tension accumulator employing nickel cadmium plates

For servicing super-het sets this Weston model 662 test oscillator is highly useful. It has a frequency range from 125 to 3,000 kilocycles

To obtain self-adjusting volume control is now really a very simple matter, there being at least half a dozen circuits for each type of double-diode-triode valve on the market. So that here again the amateur can participate in developments that count—the set maker no longer has the prerogative of the best improvements.

One of the most important developments is the suppression of background noises—especially in multi-valve super-hets. Although a noise suppressor cannot be made in unit form the different components with circuits will be available for the amateur.

Improved Automatic Volume Control

Suppression takes the form of improved systems of automatic volume control—such as delayed and quiet self-adjusting volume control circuits, as well as definite manual controls for cutting down background by limiting the sensitivity of the high-frequency stages—still leaving the volume control operative up to the topmost limit imposed by the adjustment of the noise-suppressor control.

Although it is almost safe to say that there will not be any set at the Show without a self-contained loud-speaker, all the manufacturers have made provision for external connections of loud-speakers, even though the impedances may be widely different. Some makers have gone a stage further, cutting out the internal loud-speaker at will when the external one is wanted alone.

Very high permeability is claimed for the magnet of this Haynes moving-coil—the chassis is available in blue-grey cellulose and chromium plating

Very few of the sets will have tuning scales calibrated in station names. In the rare sets where the scales are so calibrated provision has been made so that they can be removed from the front. Most of the sets have a wavelength scale fitted behind the escutcheon and held in position by a couple of screws for easy detachment.

For the first time there will be one or two all-wave radio-gramophones—built on American lines with twelve to eighteen valves to do the various jobs required of a really de-luxe radio outfit.

Talking of luxury sets, even the yatchsman has been taken care of this year. More than one model will be shown especially designed for the peculiarly difficult conditions afloat. These run from dry batteries or small lighting plants.

Curiously enough, loud-speakers in separate cabinets seem to be staging a come-back. As most of the sets now

give a high output the average listener uses one set with several extensions. The loud-speakers at the Show this year will all be supplied with multi-ratio transformers, so that good matching with any set is the work of a moment.

More than one pretty-looking loud-speaker appealing to the feminine taste will be on show—again in colours that will match any furnishings.

Frequency Changers for Super-hets

Among the most important developments must be mentioned valves of all types. The outstanding advance is the battery- or mains-operated frequency-changer for super-hets. There will be octodes, heptodes and penta-grids, which finally remove the few remaining snags of super-het design—at any rate when worked with suitable coils. Incidentally, these special coils will be available at the same time as the valves—a great point for the amateur.

The first Crusader set is coming! Next week full constructional details will be published, as a sequel to the preliminary article which you will find on page 129. This, the first of the constructional designs launched under the great Crusade, is a really hot set. It represents the consensus of opinion of a great many keen amateurs—as well as being the result of the united researches of the whole of the AMATEUR WIRELESS Technical Staff. It will be a "two-high-frequency" set, with combination detector valve giving full self-adjusting volume control. The output will be very special—and at every stage in the design you will find evidence of up-to-the-minute exploitation of technical developments

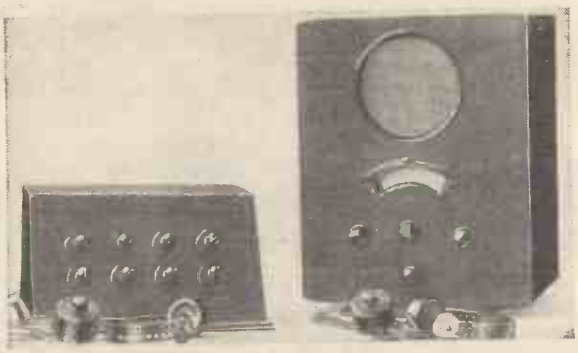
Screen-grid valves would seem to be losing ground. High-frequency pentodes are to be seen in all of the high-frequency stages and as detectors in super-het sets. When used as a detector these valves give enormous stage gain and at the same time wipe out the need for a low-frequency transformer—another economy development.

Valves of the popular type have been appreciably reduced and, coupled with the all-round cheapness of components, you ought to be able to make sets cheaper than ever—especially as many odd parts can now be omitted without loss of efficiency.

New Output Pentodes

From the new output pentodes, giving 3,400 milliwatts with only 250 volts high-tension supply, any keen amateur can now revel in the great advantages of a high output—even with simple two- or three-valve sets.

Marconiphone Radio-gramophone par excellence—model 291. Latest seven-valve super-het chassis, large moving-coil loud-speaker and automatic record changing



With this Multitone set the deaf can hear, as has been proved by many impartial tests. On the right the set, on the left the distribution board for headphones

This is the Smith's 2RAN accumulator

Triode output valves have been modified so as to give up to 3 watts output—giving very good quality—but as they will need plenty of high-tension the mercury-vapour rectifying valves have come back into favour. This type of valve will give up to 250 milliamperes current, which should be enough for the largest of home sets.

Two-in-one Valve

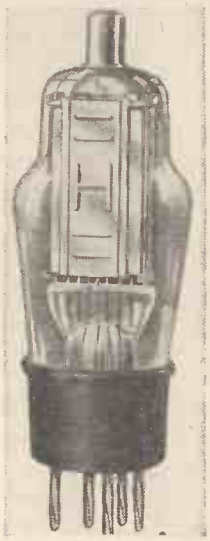
As universal valves obviate the need for a mains transformer, with a maximum rectifying voltage involved of only 250 volts, a special two-in-one valve has been evolved.

This valve will give 250 volts at 240 milliamperes, or 400 volts at 120 milliamperes, with an input of only 250 volts. This again will save cost on the mains transformer.

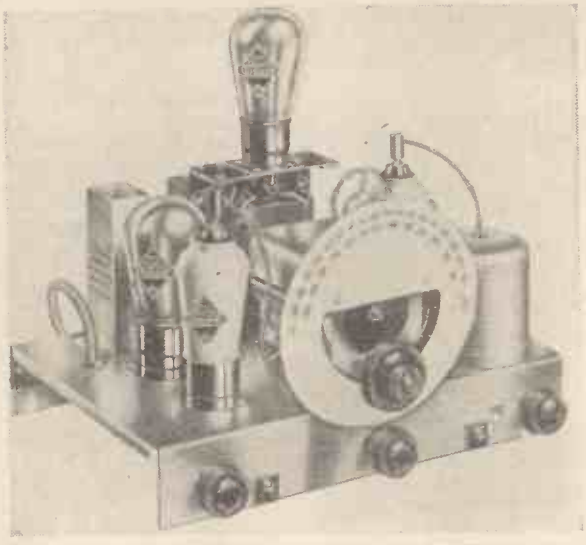
Pentode valves seem to have come to stay, and this year there will be some really good 400-volt pentodes for super-power output with only small inputs.

With these valves preceded by only one low-frequency stage, a gramophone pick-up will load the output valve to give an output of over 10 watts.

For some reason or other the diode has come back. We do not quite see the need for this because it has



One of the new Hivac mains screen-grid valves



Cossor Melody Maker for A.C. mains—a popular kit that will give excellent results when used with a mains-energised moving-coil loud-speaker

No one can fail to be impressed with the very striking appearance of this McMichael Twin Supervox mounted on a handsome stand

always to be followed by some sort of amplifier—a diode-triode would seem preferable, especially as it saves the expense of a separate valve and holder.

Talking of output, the power supply of the modern set has not been neglected by the radio trade. Transformers giving high outputs, such as 500 and 1,000 volts, together with a number of filament windings, will be almost as common as the 200-volt transformers used in the average family set.

These transformers are amazingly compact, with tightly clamped irons, impregnated

Departure for Heayberd—a low-frequency amplifier capable of giving 2.5 watts undistorted output

windings to avoid hum and buzz, and mains fuses as an integral part on the primary. Most of these transformers, by the way, are tapped so that the unusual 110 volt inputs can be used as well as the more normal 230-volt input.

Smoothing chokes will have an almost constant inductance, with currents up to 120 milliamperes. These are likely to be very cheap—a difference even from last year, which such components were almost prohibitively dear for ordinary amateurs.

Compact resistances handling between 5 and 10 watts are now coming into general use. Compare this state of affairs, again, with the somewhat clumsy wire-wound resistance of only two years ago.

Electrolytic condensers capable of standing a pressure of 500 volts at high capacity are now available, so there is no excuse for hum in home-built sets. By the way, these condensers are now so cheap that it is just as easy to use electrolytics as ordinary paper types.

Royal Grand cabinet—well named!—in the Pickett range. This one is in oak, as used for our Broadcast Critic's set, recently described

Among short-wave developments will be found a host of components made of the new high-insulating materials, including high-frequency chokes, valve holders, condenser bases and tuning coils. For all-wave sets there will be four-gang condensers, one half being a standard .0005-microfarad and the other half .00015-microfarad for short-wave tuning.

Special tuning dials for these condensers will be ready, giving two ratios—nine-to-one, and of some hundreds-to-one for short waves.

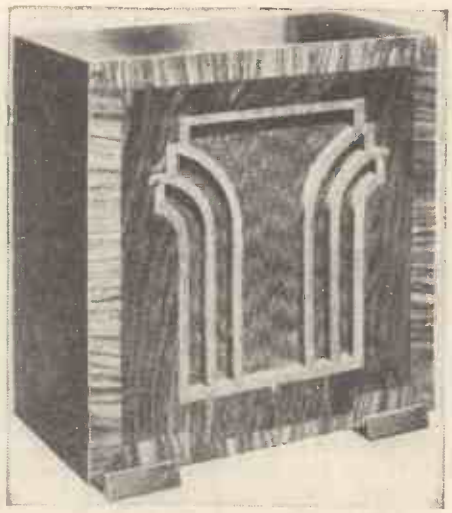
Dealing in brief with some of the outstanding component developments, there will be some very interesting intermediate frequency coils for super-hets. The point will be the variable coupling between primary and secondary, enabling the selectivity to be varied between 7 and 20 kilocycles.

In this way the amateur can definitely get ahead of commercial practice, for there is no doubt that in due course variable selectivity will have to become general.

Skeleton high-frequency chokes and scratch filters are also components that merit attention. Then there are coils covering five wave-ranges on a multiple switch, enabling really good all-wave sets to be built.

Fydelitone loud-speaker in the Baker range, available in handsome bakelite cabinet. A major and a minor model have been produced to suit all listeners' needs

Parmeko gramophone amplifier, giving the very high output of 6 watts. It is enclosed in sheet steel cabinet with cellulose-enamel finish



This is the G.E.C. Senior permanent-magnet moving-coil loud-speaker in walnut cabinet—especially recommended for external use with new G.E.C. receivers

For use where good moving-coil quality is needed in a confined space this Celestion model E6 electro-dynamic loud-speaker has been designed

Rochelle-salt Crystals

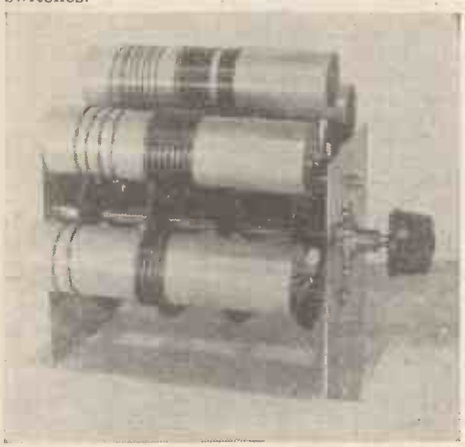
Rochelle-salt crystals are being extensively used for level frequency response in microphones, loud-speakers, and gramophone pick-ups, while quartz crystals in vacuum will be ready for the home constructor to make his own high-selectivity super-het.

Combined coils and tuning condensers on one chassis, with coils suited for all sorts of valves, will be shown—a great advantage over last year, when one coil had to do for all-valve applications.

Finally, we might comment upon the wealth of test apparatus that has been developed for amateur and professional use. Combined volt-, milli- and resistance-meters at low prices will be available, so that the amateur can test not only his set but all the components.

Components by the Score . . .

BULGINS, who in the past have specialised in small components and other bits and pieces so useful to the home constructor, have now launched a very complete programme of coils, fixed condensers, and switches.



An all-wave coil chassis. Any five coils can be plugged in to cover wavelengths between 10 and 2,000 metres

One of the most interesting developments is a special coil chassis for use in all-wave receivers. This chassis actually consists of a base, switch, and five coil holders. The idea is that coils to cover all wavebands can be plugged into the chassis and any one coil can be brought into circuit by means of the internal multiple switch.

Special coils will be available to cover all wavelengths between 10 and 2,000 metres.

Wire-wound volume controls are always a source of trouble if they are not capable of carrying a fairly high current. The new Bulgin controls are rated to carry 3 watts and are supplied complete with switch.

Electrolytic condensers of the set-makers' type in cardboard boxes are now ready. Besides saving a considerable amount of money there will also be a saving in space. The cost of a 4-microfarad 200-volt condenser is only 3s. 9d.

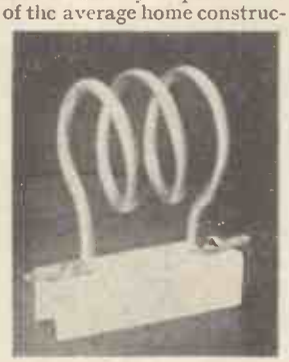
A multiple switch that makes or breaks two sets of five contacts at one operation has been designed for use as a wavechange switch in multi-valve receivers.

Variable resistances that will handle 60 watts without overheating have been introduced for D.C. work. This type of resistance has a multiplicity of uses and can be used as either potentiometer or simple series resistance.

Testing equipment is usually expensive or beyond the scope of the average home constructor. But the new Bulgin valve testing outfit to accommodate 4-, 5-, 7-, and 9-pin valves will surely interest the enthusiast.

Every connection is provided with a split pin so that a milliammeter can be inserted.

A voltmeter can be connected across any two points so that all the usual valve characteristics can be obtained.

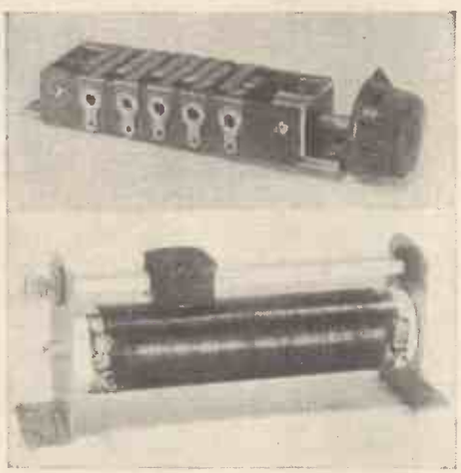


These are the first short-wave coils made in this country to use silver-plated copper wire

Skeleton components of low-loss construction and fitted with soldering tags will enable the constructor to make up inexpensive receivers of a simple nature.

A special 5-10 metre coil for television receivers has been designed. This coil is without a base as it is intended that the coil be connected directly across the tuning condenser.

An entirely new idea that will have a universal appeal is a resistance board. It enables the set builder to group together all the resistances or tubular condensers that are used in the receiver. This will make wiring simple.



The switch at the top is for wave-changing and connects ten points together with one operation. At the bottom is a resistance to carry 60 watts for D.C. work

New Loudspeaker

W.B.'s latest loud-speaker, the Stentor. Has a high flux density and gives exceptional bass response

A NEW range of W.B. loud-speakers has just been introduced which have been designed around a special alloy giving double the magnetic strength of any other material for the same cost.

The chief advantages of the new alloy are that sensitivity is greatly increased, bass response boosted, and the overall frequency response greatly improved. Owing to the increased strength of the magnet it has been found possible to widen the air gap.

Not More Than Two Guineas

So improved are the new units using this alloy that the makers feel that loud-speakers costing more than £2 2s. will no longer be required, as small increases in cost will not have any effect on the quality. The Whiteley Electrical Radio Co., Ltd., realise that a good loud-speaker can be produced for a small sum so that a more expensive unit would be a waste of money.

So sensitive are these new units that they will operate from small battery power valves and give good volume and quality. The Senior model will handle an output of 5 watts and still retain its sensitivity.

Several new ideas have been embodied in the Stentorian range of units, including a completely protected air gap and an improvement on the Microlode matching arrangement, so that the loud-speaker can at once be matched to the output valve.

Some Things to Look Out For

EVERY other set maker will be showing a set suitable for A.C. or D.C. mains without alteration. This type of set will be amongst the most popular on show. If you remember that last year there were only three sets of this kind available it is rather a change of front on the part of the set makers.

For the first time there will be several all-wave radio-gramophones built on American lines with plenty of valves and twin loud-speakers. Self-powered short-wave converters will be very prominent and actually designed so that they can be used in the tropics without alteration.

Universal valves with seven-pin bases and the grid connections coming out to the top rather show that some sort of standardisation is at last being attempted.

Shadow tuning which, until now, has been confined to commercial sets, will be used in home-constructed sets next season. Several makers have visual tuners in unit form that can be fitted to most multi-valve receivers.

The kit makers are keener than ever to produce cheap sets for home construction, so there will be several kits for mains working costing about £7.

Pick-ups with Rochelle salt crystals that give a high output and good quality will be on view for the first time.

Silver-plated wire is being used by several makers in the construction of short-wave coils. This is an American idea that is being used for the first time over this side.

We hear that moving-coil loud-speakers costing about 15s. will be seen this year. These will not be energised models, but full-sized permanent-magnet units.

Radiolympia

THIS year the Radio Exhibition opens its doors at Olympia on Thursday, August 16, and will remain open until Saturday, August 25, so that enthusiasts will have nine full days in which to inspect all the latest developments.

Readers of AMATEUR WIRELESS are cordially invited to visit Stand No. 10, where a number of new constructors' sets will be on view and where members of the Technical Staff will be available to answer queries of all kinds.

And, of course, there is the B.B.C. Theatre, where well-known broadcast artists will be performing three times a day for your entertainment.

Next week's AMATEUR WIRELESS will contain detailed information about the new season's products—particularly those of interest to the home set constructor. Look out for it next Wednesday!

Some Recent Television Inventions

By H. CORBISHLEY

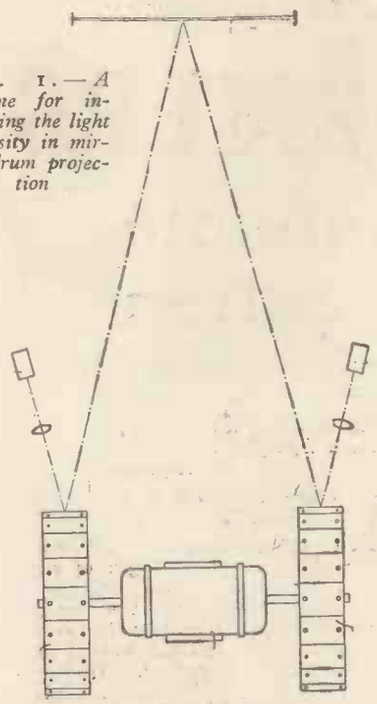


Fig. 1.—A scheme for increasing the light intensity in mirror-drum projection

THERE are innumerable problems waiting to be solved in television, and any amount of scope is available to the inventor. That these facts are evident to many is shown by the number of patents that are being taken out relating to the subject. Many of these, of course, are by firms and individuals who are actively engaged in the development of the new science, but there is also a considerable number which reveal the work of private individuals.

Popularity of Cathode-ray Systems

So far as patent records show, cathode-ray systems and appliances are receiving more attention than mechanical systems and mechanical devices, though this may be because cathode-ray television is a more recent development on which intensive research work is now proceeding, whereas mechanical systems have been receiving attention for a fairly considerable period.

Generally speaking, the inventions are of a very diverse character, and it will be interesting to mention a few of these briefly in order to show what a wide field is open to the serious worker.

Cathode-ray Improvements

These include such subjects as focusing the electron jet in the cathode-ray tube, synchronising systems, scanning drums, method of obtaining saw-tooth scanning for cathode-ray receivers, fluorescent screens, screw scanning drums, apparatus for generating saw-tooth oscillations, method of preventing damage to cathode-ray tube screens, composition of cathode-ray screens, methods of scanning films, picture with sound transmission, distribution systems, photo-electric cells, non-scanning systems, light-control valves, etc., etc.

One of the greatest needs of television to-day is an improved method of modulating light, or alternatively the production of a lamp which will provide a powerful source of light and which can be modulated directly.

For modulated light we are still compelled to use systems which were known very many years ago, and the only progress that has been made in this direction up to the present is slightly greater efficiency which, however, is still very low.

It is perhaps remarkable that very few methods of improved mechanical scanning have been patented. That this subject is by no means exhausted is proved by an idea recently patented by J. L. Baird and Baird Television, Ltd.

The purpose of this invention is to provide a greater light intensity with the light systems which are now available by a method of multiple scanning. This is shown in the diagram, Fig. 1, and it will be seen that two mirror drums are used mounted on the shaft of the one motor and that also two light sources are provided, the light from which, after reflection from the drums, coincides at the same point on the viewing screen.

Obviously this method increases the complication of the receiver, but it will attain the object of increasing the illumination.

A useful device which is now universally used with receivers of the mirror-drum type is the mechanical filter shown by Fig. 2. The object of this is to filter out any irregularities in the drive. In this illustration B is the driving shaft, and to the end of this is permanently attached a flange A.

Between this flange and the actual drum F there is an elastic link L, and the drive from the flange to the drum is taken through this and small variations of speed are therefore not transmitted to the drum. Simple though this arrangement is, it is most effective and as remarked before it has become practically a standard fitting on receivers of the mirror-drum type.

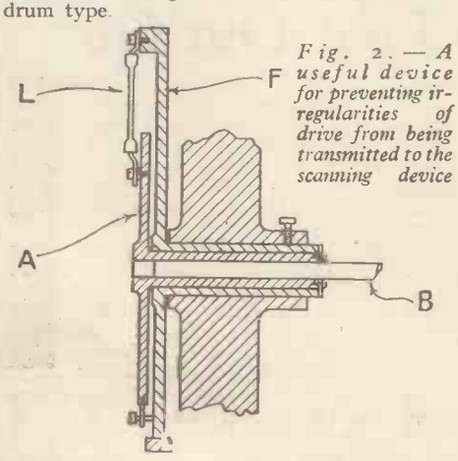


Fig. 2.—A useful device for preventing irregularities of drive from being transmitted to the scanning device

The foregoing examples indicate how simple are many of the ideas which are of practical use. Of much greater elaboration is the system shown by Fig. 3, with which it is proposed to combine speech with television.

This is based on the Scophony system of which so much has been heard of late, and the method necessitates in the first place the conversion of ordinary sound signals into an equivalent visible effect.

The idea of converting the sound signals into a visible form is entirely novel. It is accomplished by applying the microphone currents to a pair of rod electrodes which have been charged up to a point just below that at which a spark discharge can take place,

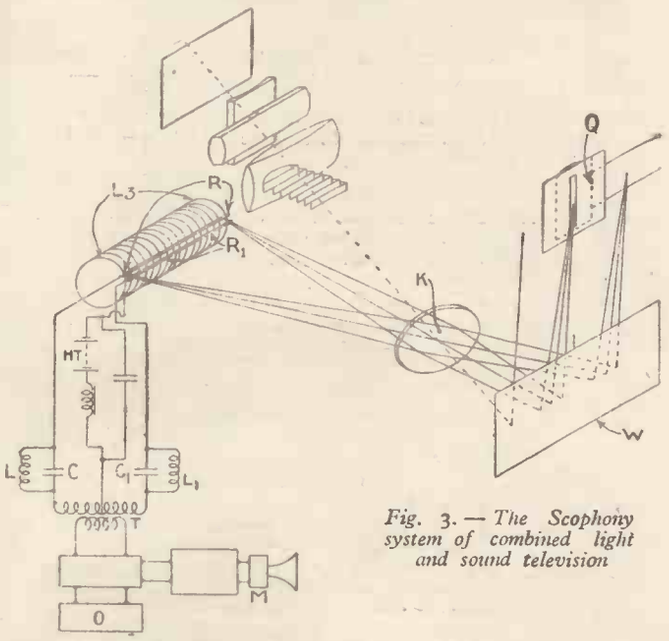


Fig. 3.—The Scophony system of combined light and sound television

when the addition of the microphone voltage acts as a trigger to release a series of sparks which are a visible representation of the speech.

The lower part of the diagram shows how the currents from the microphone M are fed to the amplifier and then modulated on to a carrier wave generated at O. The modulated output is fed through a transformer T to two circuits L, C and L_1 C_1. From here they pass to two rod electrodes R and R_1 which are placed close to a coil L_3.

Path for the Sparks

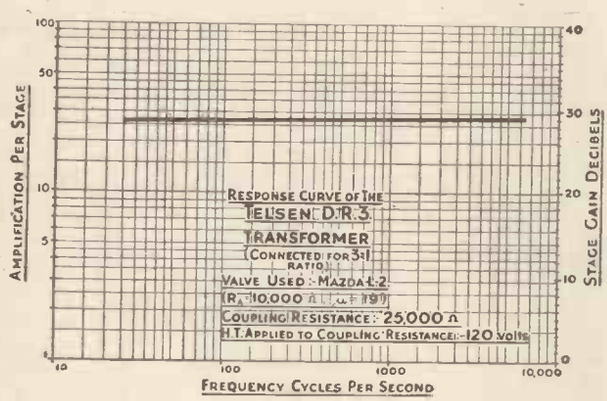
The sparks do not pass at random between the rods, but select the particular point along the coil at which the resulting discharge current finds itself in tune with the circuit opened up by the spark discharge. In this way the original sound frequencies are transformed into a spaced series of sparks and the resulting band of light is then projected by a lens K on to a vibrating mirror W, which simultaneously receives the picture elements from an echelon scanning device, when finally the combined sound and picture light variations are swept by the mirror W across a photo-electric cell Q.

At the receiving end the sound signals are converted back to their original frequency values by a somewhat similar system as used at the transmitting end.

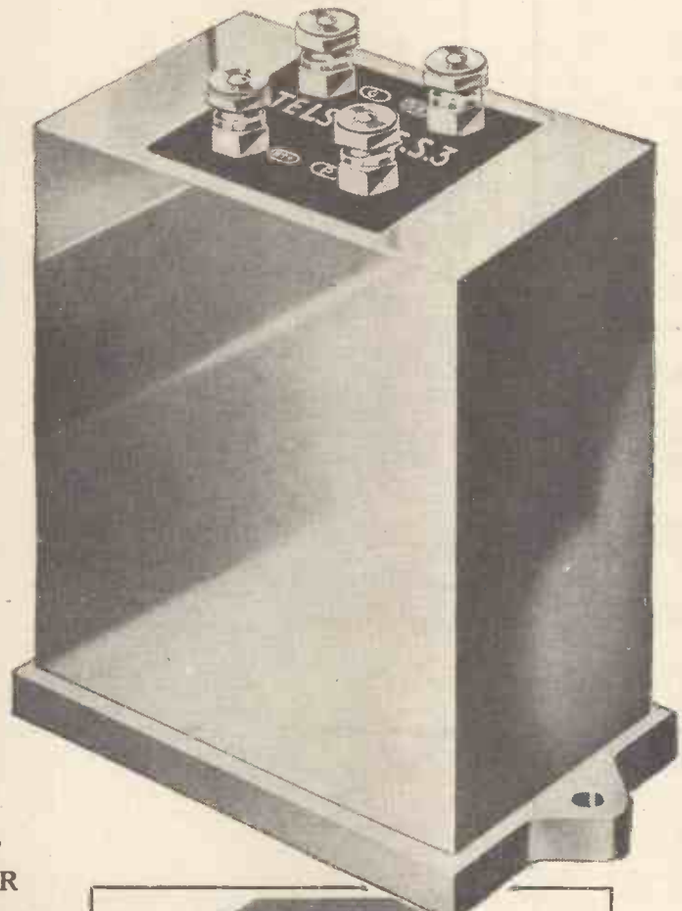
TELSEN

'D.R.' & 'G.S.' TRANSFORMERS

provide hitherto unattainable uniformity of amplification



THESE unique transformers are based on entirely new principles of design and construction, formulated by Telsen technicians after intensive research extending over a considerable period. Not only do they provide characteristics which reveal a new high-level of performance—(that of the D.R.3 as you can see being a *dead straight-line*)—but, by means of spaced layer windings impregnated with a non-hygroscopic material of very low specific inductive capacity, they absolutely eliminate the possibility of shorted turns or breakdowns due to large magnetic surges. Their high efficiency is *permanent*.



TELSEN 'D.R.' TRANSFORMER

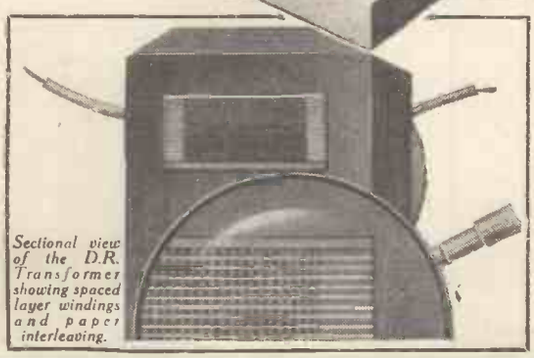
The Parallel-fed transformer which provides absolutely uniform amplification. Several heat treatments under pressure and in a vacuum produce a rigid honeycomb structure free from impurities, presenting a very low distributive capacity (see core section on right). A special nickel iron alloy core of very high permeability ensures enormously increased inductance—that of the D.R.3 being no less than 150 henries.

D.R.3 (Ratio 3-1)
D.R.5 (Ratio 5-1) **8/6**

TELSEN 'G.S.' TRANSFORMER

Directly-Fed Transformers based on the same advanced principles. A silicon steel alloy core ensures an extremely high inductance without saturation when the primary is passing the normal anode current of detector valves. Can be connected directly into the anode circuit—max. D.C. primary current 5 m.a.

G.S. 3 (Ratio 3-1)
G.S. 5 (Ratio 5-1) **8/6**

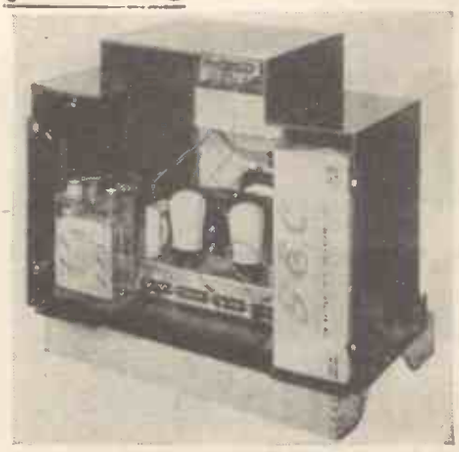


Sectional view of the D.R. Transformer showing spaced layer windings and paper interleaving.

TELSEN FOR EVERYTHING IN RADIO

Announcement by THE TELSEN ELECTRIC COMPANY LIMITED, ASTON, BIRMINGHAM

G.E.C. Compact Battery Three



Back view of the Compact Three—one of the best value-for-money sets to be seen at the forthcoming Radio Show!

NOW that most people have got over the idea that a set has to be large and bulky for it to be efficient we hope in the near future to see more receivers of the G.E.C. Compact Three type.

This class of set, that is cheap because of its small cabinet and compact chassis, efficient because the circuit is simple and straightforward, gives good quality, for it uses a moving-coil loud-speaker fed by a super-power output valve. All these features are important and not usually found in sets of this kind and price.

Moulded Cabinet

The cabinet is of bakelite moulding in dark brown, relieved by an ornamental front, which runs into the loud-speaker fret. All of the knobs and escutcheon match the cabinet so that the final effect is pleasing and not "cheap" looking, as might be expected in view of the low price.

An out-sized tuning knob in the centre of the panel is easy to grasp and, coupled with the slow-motion drive on the tuning condenser, makes station selection an easy matter. Directly above the tuner is a calibrated scale which reads from 0 to 100 degrees, equal to 200 to 550 metres on medium waves and 900 to 2,000 on the long waves.

Reaction, controlled in the usual way by a condenser, is on the extreme right of the set and provides a positive volume control unless the set is operated right in the shadow of the local station.

At the bottom of the cabinet are two simple make-and-break switches used for wave-changing and switching off the low-tension accumulator. One of the most important controls has been left until last, that is the selectivity device on the left of the panel.

Suitable for All Conditions

This device consists of a series-aerial condenser which, when used in conjunction with the alternative aerial tappings at the back of the set, makes the receiver suitable for all conditions no matter how close you are to a powerful station.

When two stations mutually interfere they can usually be separated by adjusting the condenser to a lower capacity.

Ample room has been left in the cabinet for the wet and dry batteries, so, with the exception of the aerial and earth, the receiver is entirely self-contained. Sockets are provided so that gramophone pick-up can be used at will and as the output valve is a big one with ample high-tension voltage to feed it, the quality is good, even at full volume.

We noticed, however, that a separate volume control is needed to reduce the output from the pick-up so that volume is kept down to normal room strength, for the control on the receiver only operates on radio. An external loud-speaker of the high-resistance type can be connected across the sockets provided at the rear of the chassis without upsetting the quality from the internal unit. This is quite a sound idea.

When the receiver was used in the normal way the average anode current was 12 milli-amperes, which gave a battery life of at least 200 hours. The approximate filament current was .5 ampere or .4 ampere without the dial light, so that the accumulator supply would run for 20 to 25 hours with one charge.

As is usual with sets not having a pre-detector high-frequency stage, a lengthy aerial of up to 80 ft. or so is an advantage and will not spoil the selectivity. We did find, however, that the local stations could be heard on the earth lead alone, so don't imagine for a moment that the receiver cannot be used on indoor aerials.

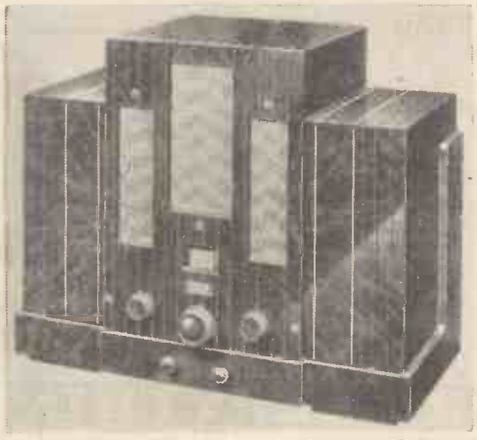
Owing to the special construction of the detector valve, there was absolutely no trace of microphony even though the loud-speaker is virtually on top of the valve. This meant that the set could be pushed to its limit without trouble and weak stations brought up in strength.

On an aerial 80 ft. in length and at a distance of 30 miles from the local station, stations up to six channels from the Regional and the National were swamped. This may sound a lot, but in practice only means the loss of *four degrees* on the tuning scale.

As a general rule twenty stations were always on tap even under poor conditions. On Sundays, Fécamp, Luxembourg, Radio Paris, and Hilversum could always be heard from the first programme in the morning to close-down. This ensured plenty of alternative programmes.

The more powerful German stations could be tuned in in the early evening and although daylight range was restricted, three or four medium-wave foreigners were always available.

The North Regional programme, about 200 miles distant, was regularly heard at good strength, while occasionally the West Regional station, always difficult to receive in our part of the country, was heard for short periods. Athlone and Budapest were also always well received and occasionally the lunch-time programmes for Radio Athlone were louder than the North Regional programmes.



From this front view of the Compact Three you will see that control is simple and the cabinet attractive

On long waves, Huizen, Radio Paris, Motala, Luxembourg, Copenhagen and Croydon were very reliable and generally heard without interference. We did find, however, that if the aerial was too long there was a tendency for medium-wave break-through for the first few degrees on the dial.

At £5 17s. 6d. the G.E.C. Compact Three is really an excellent little set and should be given every consideration. Don't let the low price deter you from comparing it with sets costing a lot more.

These Earths Mean Better Signals!

Continued from page 124

lay a wide-area earth that gives splendid results. The soldering is again highly important—we show you as a suggestion a lead soldered to the centre point of the opened strip—but there is nothing to stop you making several joints along the length of the strip. The more contacts you make the lower the resistance of the resulting earth system.

Perhaps when you come to Fig. 5 you will want to smile—if not laugh. For it certainly is an odd-looking affair for an earth. Nothing less than a large disc of copper cut spiral fashion and pulled out as shown.

The great advantage is *large area* again, and if you make the two connections to the lead with a good drop of solder it will give wonderfully good results. Solder a stout lead to the bottom of the spiral and also to the point at the very peak of the spiral. If you do this the spiral will be fairly rigid, but you will need quite a big hole to get it into without damage. Once in, of course, it does not matter.

As a final hint, we might draw your attention to Fig. 6, which shows a method of making soldered connections to earth plates. The ordinary soldering bit would not get hot enough to enable the copper plate to "take" the solder.

So you use either a bunsen burner or the ordinary gas ring can be called into service. Make a hole in the plate and thread your copper earth wire through it. Then heap up around the hole some small pieces of solder and a liberal amount of the flux.

Hold the whole job over the gas flame and when hot the plate will take the lead and form an absolutely firm joint.

BRIEF SPECIFICATION

Makers: General Electric Co., Ltd.

Price: £5 17s. 6d.

Model: BC3536.

Valve Specification: Triode detector (Osram HL2), resistance-capacity coupling to a second triode valve (Osram HL2), which is in turn transformer coupled to a super-power valve (Osram P2).

Power Supply: Internal dry batteries and low-tension accumulator.

Type: Self-contained straight three, with moving-coil loud-speaker.

Remarks: The very cheapest three we have tested and approved.

P.A.41.A

Paul D. Tyers Designs New PORTABLE!

Paul D. Tyers, one of the best-known set and component designers in the radio trade, has produced the TYERS PORTABLE for the August WIRELESS MAGAZINE. Below are some of the other forty-odd features also to be found in the August number:

FOR THE CONSTRUCTOR

"W.M." Band-spread Short-waver. Designed by the "W.M." Technical Staff.

TECHNICAL FEATURES

What New Ideas Shall We See This Season? By the "W.M." Technical Staff

Making and Using a Universal Tester. By Marcus G. Scroggie, B.Sc., A.M.I.E.E.

How to Trace and Cure Hum. By S. Rutherford Wilkins.

Our Tests of the New Sets.

Tests of New Apparatus.

Using the New Valves. By the "W.M." Technical Staff

GENERAL ARTICLES

Guide to the World's Broad-casters. By Jay Coote

World's Broadcast Wavelengths.

Valves in the Making.

I.B.U.—The Radio League of Nations. By Alan Hunter.

Should Amateur Transmitting Be Encouraged? By Kenneth Jowers.

Automatic S O S for the Yachtsman. By Malcolm Harvey.

A Warning to the B.B.C. By Whitaker-Wilson.

My Experiences With Car Radio. By Percy W. Harris, M.Inst. Rad. E.

Forty Seasons of "Prom" Concerts. By Whitaker-Wilson.

America's New 500-Kilowatt Giant. By Lionel Merdler.

Wireless Jobs Made Easy for Mr. Everyman. By R. W. Hallows, M.A.

New Egyptian Broadcasting Studios.

On the Crest of the Waves. By Jay Coote.

The "W.M." Empire Short-waver in Fiji.

Choosing Your Records. By Whitaker-Wilson.

TELEVISION SECTION

The Construction of Television Receivers. By H. Corbishley.

WIRELESS MAGAZINE

August Issue—Price 1/-

Criticisms by WHITAKER-WILSON

My Broadcasting Diary

Nice Schubert Voice :: From Noo Yourrk Ciddy ! :: Van Phillips' Good Show :: Success of "Mr. Pim" :: Very Lauderable !

Sunday

BEGAN late but well. In the twilight I listened to Arthur Catterall. You remember what Elgar said of him? "If he were not English he would be accounted as one of the greatest violinists of our time." He played beautifully to-night.

Monday

MISSED the early part of the Schubert programme. Sorry, because I am a Schubert fan. Caught Mary Hamlin in her last group. Nice Schubert voice, but I wanted a little more imagination. Phrasing, diction—*everything* good except that one thing—imagination. How difficult it is to describe exactly what one misses! I hope to hear Miss Hamlin again. Her voice is delightfully clear. Before I forget it, a word—allow me—for the Western Studio Orchestra. Nicely balanced, nicely trained.

◆ ◆ ◆

The scholars of Riverdale Country School, all the way from Noo Yourrk Ciddy, seem to be enjoying themselves in London. I liked most of their songs but not the way they sang them. Swing Low, Sweet Chariot—well, they underswung it a trifle. By Jove, they *did* sing flat!

Candidly, they were not up to our standard. They were not too bad in unison, but when they tried splitting up into harmony I felt I wanted to use a musical screwdriver on them and get the pitch trued up a bit.

Van Phillips and his Orchestra gave a good show. They had a strong cast. The humour, with the Two Leslie's—he of the Sarony family winning my heart again by lifting up his finger and tweet-tweeting; Danny Malone and Olive Groves for the nice slop-stuff; a good array of instrumental Guy Fawkeses who shot sparks out of their instruments; and Maurice Elwin as refrainer for the modern dance stuff.

Not too bad, neither. 'Veard worse.

Tuesday

I'M a little curious. Does the B.B.C. consider the period from 7.30 to 8 p.m. (1930 to 2000 if it *must* be that way) an important period or not? I say "yes."

I think a flute and harp recital hardly enough for *both* programmes at that time. Not everyone likes a flute to tootle or a harp to twang. I quite enjoyed Edith Penville on the one and Frederick Hall on the other, but I can think of many who might not.

◆ ◆ ◆

I have always had a good opinion of the Theatre Orchestra. If I hadn't I should have changed it to-night. They played Alfred Reynolds's and Haydn Wood's music delightfully. Conducted by the composers, too. That means they were in the hands of strangers, instead of Kneale Kelley or Stanford Robinson or Leslie Woodgate. A tip-top concert.

B.B.C. photo

Olive Groves, the well-known singer, who took part in the Van Phillips show, which had a strong cast

The Canada programme, as far as I heard it, seemed to be the usual type of commemorative affair with which we have become so familiar. Niagara sounded like a cross between my emptying bath water on the lawn from the bathroom window and an airplane missing on one cylinder—that is, if airplanes have cylinders to miss on. Have they?

Wednesday

I SHOULD have been sorry to miss the performance of *Mr. Pim Passes By*. As soon as I saw it was down in the programme it struck me there would be a success with it.

It did not date in the least. Perhaps having seen it on the stage helped a bit, because it was so easy to think of Irene Vanbrugh as Olivia stitching away at those curtains.

Another point. Wireless plays, because aural scenery costs nothing, are inclined to be written extravagantly in that sense. Not one half could ever be put on the stage because it would be so expensive. Yet, when a play has only one scene, it is readily accepted for stage production. I am of opinion that one-scene plays are good for radio also.

Simplicity of construction—and what is simpler than *Mr. Pim*?—also tells. Irene Vanbrugh's laugh was just as infectious as ever. Richard Goolden a delightful Mr. Pim. Cast strong all through. Gordon McCleod's idea of George Marden was my idea of him. Consequently I was satisfied. A great success!

◆ ◆ ◆

Max Kester and Bryan Michie did well with their *Air-do-wells*. They can get together again with *Air-do-Betters* or something of the kind. If they put people like Eve Becke and Claude Gardner in it there is a chance of its being voted *Air-do-Best*.

Friday

MISSED everything until the dance music. Harry Roy. One thing struck me. These outside relays of dance music have a stronger atmosphere because of the applause of the dancers. The afternoon broadcasts give an impression, by comparison, of a *recital* of dance tunes. The later broadcasts seem more the real thing.

Saturday

A GOODLY variety. Noticed the youngster particularly. Watch for him next year. Name: Walter Tetley, despite what the announcer called him (William). He is over here on a visit from America. His Scottish songs gave me the impression we have a second Lauder in the making. Very Lauderble.

Al and Bob Harvey very good. I wish we had more of them. Their way of singing admirably suited to the microphone. You can imagine them smiling. They do.

Jenny Howard a very good comedienne. She made the band sing with her. When she sang out of tune, they did the same! Very amusing. Ernest Butcher too good for variety. No, on second thoughts, variety singing should be brought up to his standard. I liked his Irish songs immensely.

Julian Rose has returned to health again. Very characteristic. He understands the Jewish mentality.

A word for Alec McGill and Gwen Vaughan, who came at a moment's notice. *Their best broadcast*. I liked hearing the Greenwich pips calling to their young. Also pleased to know Adam invented wireless. I always said it was old. He was the first man to make a loud-speaker out of one of his spare parts—the oldest wireless joke, invented, I believe, way back in 1922 by Thermion.

Moscow on 500 Kilowatts!

By JAY COOTE

IN recent notes I mentioned that the volume at which the giant Moscow 1 station was being received did not appear to be commensurate with a power of 500 kilowatts, as we were led to understand it was using.

Curiously enough, during the fateful Austrian week I happened to tune in to the Russian nightly to listen to the news broadcasts in English, French, and German, and in the course of one of these transmissions I learnt that the 500-killowatt transmitter was only brought into action on July 20.

The difference in the strength of signals since this has been done is remarkable, and you may have already noticed it. When crises such as have recently occurred on the Continent take place it is interesting to search around for the latest news bulletin from various countries as one can get different versions of the same topic.

By so doing—tapping Switzerland, Luxembourg and Italy en route—I was given a very complete picture of the events long before I was able to read details in the daily newspapers.

Generally speaking, news bulletins are more frequently broadcast from Continental stations than from ours, and as the final bulletins are put out later so one may hear items of interest which in the ordinary course can only be found in the next morning's English press.

◆ ◆ ◆

During the recent drought I had also observed that signals from Kalundborg were not what they should be, and I was interested in reading the reason for which these transmissions were well below par although, on the same nights, stations of advertised equal power were being well received.

Apparently all the "juice" required for operating the Danish stations is supplied by Sweden *via* Malmo, and as is customary in that country is generated by water power. As Sweden also suffered from the drought, her own requirements were given first call and Denmark was put on short commons—hence the starving of her transmitters.

◆ ◆ ◆

So far, Greece—except for a "toy" transmitter at Salonika—and Albania are the only two European countries which do not possess to date a broadcasting station. Greece during the past three or four years has made several attempts to start a service, but to no purpose. Now, however, a serious move has been made, and there is a possibility that Athens next year may possess a 50-kilowatt station and that Salonika may also be given something worth while.

Wavelength Allocations

The former transmitter would work on 499.2 metres (601 kilocycles), a channel used by Radio Maroc and Sundsvall, and the latter on 373.1 metres (604 kilocycles) already occupied by Scottish Regional. This would leave a third wavelength also allotted to Greece, namely 233.5 metres (1,285 kilocycles), on which Aberdeen is operating at present, but which would still be suitable for a third and weaker station to be erected in the southern portion of the Continent.

Alterations in wavelength have been carried out by two Czech stations; Moravska-Ostrava now works on 269.5 metres and Kosice on 259.1 metres, namely, one channel above Monte Ceneri (Switzerland).

◆ ◆ ◆

Lisbon and the new 20-kilowatt Trondheim transmitter are compelled unfortunately to share the same frequency, 629 kcs. (476.9 metres) which prevents our clear reception of either when both are on the air. The Norwegian usually closes early, thus leaving the field free to Radio Lisbon. You might do worse than turn after 2200 or 2230 to Portugal; the programmes are decidedly more varied and interesting than they were at the outset.

Medium-wave Broadcasters

This week we give details of all the important European medium-wave stations. Next week we shall publish a list of short- and long-wave transmitters.

Metres	Kilocycles	Station and Call Sign	Country	Power (Kw.)
203.5	1,474	Plymouth	Great Britain	.3
203.5	1,474	Bournemouth	Great Britain	1
204.7	1,465	Pecs	Hungary	1.25
206	1,456	Fecamp	France	.2
207.3	1,447	Miskolcz	Hungary	1.25
209.9	1,431	Beziers	France	1.25
209.9	1,429	Newcastle	Great Britain	1
211.3	1,420	Tampere	Finland	1.2
215.4	1,393	Radio Lyon	France	.5
216.8	1,384	Warsaw (2)	Poland	10
218.2	1,375	Basle, Berne	Switzerland	.5
221.1	1,357	Turin (2)	Italy	.2
222.6	1,348	Konigsberg		.5
222.6	1,348	Dublin	Irish Free State	1
222.6	1,348	Milan Vigentino (2)	Italy	4
222.6	1,348	Bordeaux S.O.	France	1
222.6	1,348	Lodz	Poland	1.7
222.6	1,348	Dorpat	Estonia	.5
224	1,339	Montpellier	France	.8
225.6	1,330	Hanover and other Hamburg relays	Germany	1.5
227.1	1,321	Magyorova	Hungary	1.5
230.2	1,303	Danzig	Germany	.5
231.8	1,294	Linz and other Vienna relays	Austria	.5
233.5	1,285	Aberdeen	Great Britain	1
233.5	1,285	Dresden	Germany	.25
235.1	1,276	Stavanger and other Oslo relays	Norway	.5
236.8	1,267	Nurnberg	Germany	2
236.8	1,267	Augsburg		.25
238.5	1,258	San Sebastian (EAJ8)	Spain	3
238.5	1,258	Rome (III)	Italy	1
240.2	1,249	Juan-les-Pins	France	.8
241.9	1,240	Cork	Irish Free State	1
243.7	1,231	Gleiwitz	Germany	5
245.5	1,222	Trieste	Italy	10
247.3	1,213	Lille PTT	France	1.3
249.2	1,204	Prague Strasnice (2)	Czechoslovakia	5
251	1,195	Frankfurt-am-Main and relays	Germany	17

Metres	Kilocycles	Station and Call Sign	Country	Power (Kw.)
253.2	1,185	Kharkov (2)	U.S.S.R.	20
255.1	1,176	Copenhagen	Denmark	10
257.1	1,167	Monte Ceneri	Switzerland	15
259.1	1,158	Moravska-Ostrava	Czechoslovakia	11
261.1	1,149	London National	Great Britain	50
261.1	1,149	West National	Great Britain	50
263.2	1,140	Turin (1)	Italy	7
265.3	1,131	Horby	Sweden	10
267.4	1,122	Belfast	N. Ireland	1
267.4	1,122	Nyiregyhaza	Hungary	6.25
269.5	1,113	Kosice	Czechoslovakia	2.5
269.5	1,113	Paris (Vitus)	France	.7
271.7	1,104	Naples	Italy	1.5
271.7	1,104	Madona	Latvia	1
274	1,095	Madrid EAJ7	Spain	1.3
274	1,095	Vinnitsa	U.S.S.R.	10
276.2	1,086	Falun	Sweden	.5
276.2	1,086	Zagreb	Yugoslavia	.75
278.6	1,077	Bordeaux PTT	France	13
280.9	1,068	Tiraspol	U.S.S.R.	4
283.3	1,059	Bari	Italy	20
285.7	1,050	Scottish National	Great Britain	50
288.5	1,040	Leningrad (2)	U.S.S.R.	10
288.5	1,040	Rennes PTT	France	1.3
291	1,031	Parede (Lisbon)	Portugal	5
291	1,031	Heilsberg	Germany	60
293.5	1,022	Barcelona (EAJ15)	Spain	1
296.2	1,013	North National	Great Britain	50
298.8	1,004	Bratislava	Czechoslovakia	14
301.5	995	Hilversum	Holland	20
304.3	986	Genoa	Italy	10
304.3	986	Cracow	Poland	1.7
307.1	977	West Regional	Great Britain	50
309.9	968	Grenoble PTT	France	15
312.8	959	Poste Parisien, Paris	France	60
315.8	950	Breslau	Germany	60
318.8	941	Goteborg	Sweden	10
318.8	941	Algiers	North Africa	12
321.9	932	Brussels (2)	Belgium	15
325.4	922	Brno	Czechoslovakia	32
328.6	913	Radio Toulouse	France	60
328.6	913	Limoges PTT	France	.7
331.9	904	Hamburg	Germany	100
335.2	895	Helsinki	Finland	10
338.6	886	Graz	Austria	7
342.1	877	London Regional	Great Britain	50
345.6	868	Poznan	Poland	20
345.6	868	Fredriksstad	Norway	.7
349.2	859	Strasbourg	France	11.5
352.9	850	Bergen	Norway	1
352.9	850	Valencia	Spain	.7
352.9	850	Sofia	Bulgaria	1
356.7	841	Berlin	Germany	100
360.6	832	Moscow (4)	U.S.S.R.	100
362.8	827	Radio LL Paris	France	2
364.5	823	Bucharest	Roumania	12
368.6	814	Milan	Italy	50
373.1	804	Scottish Regional	Great Britain	50
377.4	795	Lwow	Poland	16
377.4	795	Barcelona (EAJ1)	Spain	8
382.2	785	Leipzig	Germany	120
386.6	776	Toulouse PTT	France	.7
391.1	767	Midland Regional	Great Britain	25
395.8	758	Katowice	Poland	12
400.5	749	Marseilles PTT	France	1.6
405.4	740	Munich	Germany	100
410.4	731	Seville	Spain	2
410.4	731	Madrid (Espana)	Spain	3
410.4	731	Tallinn	Estonia	20
415.5	722	Kiev	U.S.S.R.	35
420.8	713	Rome	Italy	50
426.1	704	Stockholm	Sweden	50
431.7	695	Paris PTT	France	7
437.3	686	Belgrade	Yugoslavia	2.5
443.1	677	Sottens	Switzerland	25
449.1	668	North Regional	Great Britain	50
455.9	658	Cologne	Germany	17
463	648	Lyons PTT	France	15
470.2	638	Prague (1)	Czechoslovakia	120
476.9	629	Trondheim	Norway	20
483.9	620	Brussels (1)	Belgium	15
491.8	610	Florence	Italy	20
499.2	601	Sundsvall	Sweden	10
499.2	601	Rabat	Morocco	6
506.8	592	Vienna	Austria	120
514.6	583.2	Riga	Latvia	15
514.6	583	Agen	France	6
522.6	574	Muhlacker	Germany	100
531	565	Athlone	Irish Free State	60
540	556	Beromunster	Switzerland	60
549.5	546	Budapest	Hungary	120
559.7	536	Wilno	Poland	16
559.7	536	Bolzano	Italy	1
569.3	527	Viipuri	Finland	10
569.3	527	Ljubljana	Yugoslavia	5.3
578	519	Innsbrueck	Austria	5
696	431	Oulu	Finland	1.2
748	401	Geneva	Switzerland	1.5
748	401	Moscow	U.S.S.R.	20
725.5	413.5	Ostersund	Sweden	.6
824	364	Smolensk	U.S.S.R.	10

My Short-wave Log

By J. GODCHAUX ABRAHAMS

THE identification of some of the short-wave commercial, fixed or "point-to-point" stations which is so useful for calibrating a new receiver has been simplified by the fact that in a similar way to the broadcasting transmitters a number have adopted distinctive musical interval signals.

Two or Three Notes

It is true that so far they have confined themselves to two or three notes, but if these are entered in your log or committed to memory they will greatly assist in recognising the source of the signal.

For instance, the Bandoeng (Java) stations usually picked up on 16.56 metres (PMC) and 16.81 metres (PLF) give out something akin to a three-note motor horn; the Ste Assise (France) group working with Morocco and the Argentine have adopted the same principle except that they precede the notes A, F, B, by the morse letter F, indicating the country of origin. On the other hand, Monte Grande, Buenos Aires (LSY) operating at 14.47, 16.55 and 16.71 metres will be heard emitting sounds reminiscent of a reed pipe or whistle; three notes, F,D,C.

The Nauen Notes

As to the Germans, the one most frequently tuned in is DFB, Nauen, which works with Maracaibo (Ven) and Monte Grande (Arg.); in this case you hear three tones: D,C,G. PPU, Sepetiba (Brazil), which connects up with Rugby, Ste Assise, Berlin, Madrid, and occasionally Buenos Aires, usually uses four notes: G,E,G,C. There are many more of which I am making a list which will be the subject of a special article at a future date.

Although the transmissions from the Byrd Antartic Expedition are seldom picked up direct from Little America in the British Isles, if it is desired to make a search the following channels are those mostly favoured, namely 22.68, 25.63 and 33.94 metres. The station has so many frequencies placed at its disposal that it would be wiser to try and tap its broadcast *en route* by tuning in LSX, Buenos Aires, on 10,350 kilocycles, KKP, Hawaii (16,040 kilocycles) or on some occasion's WEF and WEM, Rocky Point N.Y., on respectively 9,490 and 7,400 kilocycles.

Try towards B.S.T. 0300 any Thursday morning; you may hear WEF talking back to the Byrd station operator. As the broadcast is relayed through, say, Buenos Aires, the American station transmits it back to Little America as a check.

This is usually accompanied by complimentary—sometimes other!—remarks such as "Keep that level, John, that's swell." "John" appears to be the KFZ chief operator; "Charley" to whom references are also made is the press man with the explorers, and "Bill" to whom remarks are also addressed is the man in charge of the relay at LSX, Buenos Aires.

If you can tap the transmission between 0200 and 0300 you will hear the preparations for the polar broadcast including tests and so on.

A South American station which may be captured now on most nights is that of YV2RC, Caracas (Ven.) on 49.08 metres (6,112 kilocycles). The best time to try for it is between midnight and 0430 on week-days or after 0130 on Mondays, i.e. the Sunday-night transmission.

Continued on page 144

Television Rumours

THE recent developments in television have evidently fired the imaginations of many people and a great deal of misstatement has appeared in the Press. We read, for instance, of a wired-wireless television system which has been perfected and will soon be made available to all those who are subscribers to the various broadcast relays which are now in operation in various parts of the country. This is to be linked up with the large stores so that the housewife will be able to make her purchases by looking at the televised pictures of the articles. At other times, entertainment will be provided by various advertising interests.

Such rumours and ideas are entirely without foundation in fact. Recent progress has not indicated in the slightest degree that any such developments are even remotely possible in the near future. Developments are taking place, but they are the result of painstaking research and experiment and none of the results so far obtained can be assumed to be productive of any startling developments.

My Short-wave Log

Continued from page 143

ZTJ, Johannesburg on 49 metres, which relays the programme of the local broadcasting studio, appears to have exchanged call-letters with its "mother" and has taken over the JB denomination. It is a 5-kilowatter installed on the Witwaterstrand (Gold Reef) near Maraisburg and being of this high power should be well heard in the British Isles. Best time is between BST 1800 and 2100, but on Saturdays the transmission is carried on until 2245.

On several occasions I have been puzzled by an Italian relay of the Rome programme on 30.52 metres, and which was an S.B. from 12RO on 25.4 metres. I have since discovered that it is one made through IRW (IRU?) Rome, and destined to the Italian Colony in Tripoli. The signals are very good, in fact, in some instances louder than on the lower wavelength.

Although nothing to boast about, reception during the past week, considering thundery conditions prevailing during the greater part of the period, have not been too bad; on some evenings large sections of the short-wave band revealed little of interest, but towards the later hours conditions usually improved sufficiently to warrant searches. When such conditions prevail it is useful to try different portions of the band, as it is seldom that all are affected to the same degree.

N.B.C. and Columbia Programmes

Some short time ago I gave a list of the United States short-wave channels through which you can hear the N.B.C. and Columbia radio entertainments. Where Canada is concerned we also have opportunities of picking up broadcasts from Montreal, Toronto, Halifax (Nova Scotia) and so on through the medium of short-waves; a direct reception from the medium wave transmitters is not so practical.

VE9HX (49.09 metres) relays CHNS, Halifax, which in its turn links up regularly with the N.B.C. and C.B.S. networks. VE9GW (49.22 metres). Bowmanville, will give you programmes from CRCT, Toronto, and is also connected now and again with the N.B.C. system.

Simultaneous Broadcast

VE9BJ (49.26 metres) relies for its wireless fare on CFBO, St. John (New Brunswick), which is another link with C.B.S. and N.B.C. VE9DN (49.96 metres) is the short-wave channel of CFCF, Montreal, which switches over regularly every day to the N.B.C. programmes, and VE9CS (49.43 metres) works a simultaneous broadcast with CKFC, Vancouver.

Finally, I am informed that CEC, La Granja (Chile) may be picked up occasionally testing with gramophone records on 18.91 metres and 15.24 metres between 1430 and 1515 B.S.T. It would appear to be experimenting in telephony prior to the establishment of a public service.

Tungsram have had another success in the radio patent field. In an action brought by Tungsram before the Czechoslovak Patent Court at Prague, the well-known Schottky patent (Czechoslovak Patent No. 8037), sometimes called the "screen-grid patent," has been annulled as from June 21, 1934.

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MANY listeners still do not seem to realise the real point about the introduction of Droitwich the new 150-kilowatt National programme station.

It will entirely replace the obsolescent Daventry station—and it will work on Daventry's present exclusive long wavelength of 1,500 metres.

By present indications the Droitwich giant will have taken over all the Daventry programmes by the end of September.

Subsequently, London, North and West National medium-wave stations will be entirely closed down—but Scottish National will remain.

Television—Now or Never

"TELEVISION is not nearly so close at hand as many people imagine," said Mr. Joseph M. Skinner, president of the Philco Radio Corporation, on landing at Plymouth on Wednesday, July 25, from the liner *Manhattan*.

"The public have been led to expect too much," he said, "and the development must of necessity be on slower lines than generally anticipated.

"It has been calculated that it will cost one hundred and fifty million dollars to erect the necessary stations in the United States for the purposes of television. In England it may be possible to do the work at a lower cost owing to the Government's closer association with broadcasting. Sets will be expensive, as the public will not be satisfied unless they get good results. £100 might be a probable figure, and renewals will be a costly matter, the cost of renewing a cathode-ray tube being about £10.

Electrical Scanning

In my opinion television will come with electric cathode scanning, rather than mechanical scanning, which would set up vibration."

Mr. Skinner, who was accompanied by his wife, said the object of his visit was purely to enjoy the ocean trip, and that they were spending a fortnight in London before returning to America.

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Full-size Blueprints

Each blueprint shows the position of each component and every wire and makes construction a simple matter. Copies of "Wireless Magazine" and of "Amateur Wireless" containing descriptions of most of these sets can be obtained at 1s. 3d. and 4d., respectively, post paid. Index letters "A.W." refer to "Amateur Wireless" sets and "W.M." to "Wireless Magazine" sets. Send, preferably, a postal order (stamps over sixpence unacceptable) to "Amateur Wireless," Blueprint Dept., 58-61 Fetter Lane, London, E.C.4.

STRAIGHT

Crystal	Date	No.
Four-station Crystal Set	31.3.34	AW427
1934 Crystal Set	4.8.34	AW443
One Valve		
B.B.C. Special One-valver	6.5.33	AW387
B.B.C. One-valver	28.5.32	AW344
Two Valve		
Melody Ranger Two (D, Trans)	13.5.33	AW388
"A.W." Iron-core Two (D, Trans)	29.7.33	AW395
"A.W." Iron-core Two with Q.P.P.	12.8.33	AW396
Big-power Melody Two, with Lucerne Coils (SG Trans)	17.2.34	AW338A
B.B.C. National Two, with Lucerne Coils (D, Trans)	17.2.34	AW377A
Consolectric Two (D, Pen) A.C.	23.9.33	AW403
Lucerne Minor (Det, Pen)	24.3.34	AW426
Hiker's Headphone Portable (Det, Trans)	12.5.34	AW434
New-style Radiogram (D, Trans)	Oct. '32	WM299
Ten-station Two (Det, Trans)	5.3.32	AW336
Big Power Melody Two (Det, Trans)	2.4.32	AW338
Inexpensive All-electric Two (Det, Trans)	11.6.32	AW346
Midget Two (Det, RC)	18.6.32	AW348
Mascot Two (Det, Pen)	30.7.32	AW353
Ideal Regional 2 (Det, Pen)	3.9.32	AW357
Quality 30/- Two (Det, Trans)	8.10.32	AW361
Ether-music Two (Det, Trans)	3.12.32	AW314
Full-volume 2 (SG Det, Pen)	17.6.33	AW392
Companionette (D, Pen A.C./D.C.)	May '34	WM358
Family Two (Det, Trans)	Apr. '32	WM278
Economy A.C. Two (Det, Trans)	Jun. '32	WM286
Screen-grid Two (S.G Det, Trans)	July '32	WM289
Three Valve		
Class-B Three (D, Trans, Class B)	22.4.33	AW386
Up-to-the-minute Three with Class B, 1/6	24.6.33	AW384B
A.C. Triodyne (SG, D, Pen)	19.8.33	AW399
Home-built Coil Three (SG, D, Trans)	14.10.33	AW404
Fan and Family Three (Det, Trans, Class B)	25.11.33	AW410
£5 5s. SG 3 (SG, D, Trans)	2.12.33	AW412
A.C.-D.C. Universal Three (SG, Det, Pen)	30.12.33	AW414
1934 Ether Searcher (SG, Det, Pen) Baseboard Model	20.1.34	AW417
1934 Ether Searcher (SG, Det, Pen) Chassis Model	3.2.34	AW419
Lucerne Ranger (SG, Det, Trans)	3.3.34	AW422
P.W.H. Mascot with Lucerne Coils (Det, RC, Trans)	17.3.34	AW337A
Cossor Melody Maker with Lucerne Coils	17.2.34	AW423
Mullard Master Three with Lucerne coils	24.2.34	AW424
Schoolboy's Three (Det, 2 RC)	31.3.34	AW428
Penta-quester (HF, Pen, Det, Pen)	14.4.34	AW431
£5 5s. Three—De-luxe version (SG, Det, Trans)	19.5.34	AW435
Lucerne Straight Three (Det, RC, Trans)	9.6.34	AW437
Home-lover's New All-electric 3 for A.C. mains (SG, D, Trans)	25.3.33	AW383
Baby 3 (Det, RC, Trans)	9.1.32	AW324
1932 Ether Searcher (SG, Det, Pen)	16.1.32	AW325
New Favourite Three (Det, RC, Trans)	20.2.32	AW334
Home-lovers' All-electric 3 (SG, Det, Trans)	27.2.32	AW335
P.W.H. Mascot (Det, RC, Trans)	12.3.32	AW337
Home-lover's Battery 3 (SG, Det, Trans)	7.5.32	AW341
£8 Radiogram (Det, RC, Trans)	24.5.32	AW343
New Regional Three (Det, RC, Trans)	25.6.32	AW349
Wizard 3 (SG, Det, Trans)	17.9.32	AW360
Build-as-You-Learn 3 (Det, RC, Trans)	8.10.32	AW366
£2 2s. Family Three (Det, 2 Trans)	19.11.32	AW368
Build-as-You-Learn S.G. Three	10.12.32	AW372
Everybody's Home Radiogram (battery) (SG, Det, Trans)	11.3.33	AW381
S.G. Three (SG, Det, Pen) A.C. mains	3.6.33	AW390
New Britain's Favourite Three (Det, Trans, Class B)	15.7.33	AW394
New-style Three (Det, RC, Trans)	12.8.33	AW397
A.C. Penta-quester (HF, Pen Det, Pen)	23.6.34	AW439
Three-range Three (SG, D, Pen)	Oct. '33	WM336
Economy-pentode Three (SG, D, Pen)	Oct. '33	WM337
Simplicity A.C. Radiogram (SG, D, Pen)	Oct. '33	WM338
D.C. Calibrator (SG, D, Push-pull Pen)	July '33	WM329
Tyers Iron-core Three (SG, SGD, Pen)	July '33	WM330
A.C.-D.C. Three (SG, D, Pen)	Aug. '33	WM332
C.B. Three (D, LF, Class-B)	Sep. '33	WM333
A.C. Transportable (SG, D, Pen)	Jan. '34	WM347
All-wave Three (D, 2LF)	Jan. '34	WM343
"W.M." 1934 Standard Three (SG, Det, Pen)	Feb. '34	WM351
£3 3s. Three (SG, D, Trans)	Mar. '34	WM354
Heptode Super Three (A.C. Super-het)	May. '34	WM359
Iron-core Band-pass Three (SG, D,QP 21)	June '34	WM362
New Plug-in Coil Three	Feb. '32	WM270
Transportable Three (SG, Det, Pen)	Feb. '32	WM271
Multi-mag 3 (Det, 2 Trans)	June '32	WM288
Prosperity Three (battery)	Sep. '32	WM296
Percy Harris Radiogram (HF, Det, Trans)	Aug. '32	WM294
Prosperity Three (A.C. mains) (SG, Det, Pen)	Sep. '32	WM297
Economy 1933 SG 3 (SG, Det, Trans)	Dec. '32	WM306
A.C. Calibrator (SG, Det, Pen)	Jan. '33	WM303
Percy Harris Ethergram (SG, Det, Pen)	Jan. '33	WM308
£6 6s. Radiogram (Det, RC, Trans)	Apr. '33	WM318
Simple-tune Three (SG, SG Det, Pen)	June '33	WM327
Economy Pentode Three (SG, Det, Pen)	Oct. '33	WM337
Simplicity A.C. Radiogram (SG, Det, Pen)	Oct. '33	WM338
Six-guinea A.C.-D.C. Three (HF Pen, Det, Trans)	July '34	WM364
All-wave Battery Three (HF, Pen, Det, Pen)	July '34	WM365
Four Valve		
Melody Ranger (SG, D, RC, Trans), with copy of "A.W." 4d. postage	28.1.33	AW375
"A.W." Ideal Four (2SG, D, Pen)	16.9.33	AW402
2 H.F. Four (2SG, Det, Pen)	17.2.34	AW421
Lucerne Major (2HF, Det, Trans)	5.5.34	AW433
50/- Four (SG, Det, RC, Trans)	6.2.32	AW331
Advance Four (2HF, Det, Trans)	27.8.32	AW356
Your Home Radiogram (SG, Det, RC, Trans)	3.9.32	AW358
65/- Four (SG, Det, RC, Trans)	17.12.32	AW370
A.C. Melody Ranger (SG, Det, RC, Trans)	4.3.33	AW380
C.R. Four (2HF, Mod, Sync)	9.12.33	AW420
Quadradyne (2SG, D, Pen)	Feb. '32	WM273
A.C. Quadradyne (2SG, D, Power)	Apr. '32	WM279
Calibrator (SG, D, RC, Trans)	Oct. '32	WM300
Table Quad (SG, D, RC, Trans)	Nov. '32	WM303
Words and Music Radiogram (2SG, D, Trans)	Feb. '33	WM307
Calibrator de Luxe (SG, D, RC, Trans)	Apr. '33	WM316
All-metal Four (2SG, D, Pen-A.C. Mains)	July '33	WM329
Self-contained Four (SG, D, LF, Class-B)	Aug. '33	WM331
All-progress Four (Battery Super-het)	Sept. '33	WM335
Merrymaker Super (A.C. Super-het)	Dec. '33	WM345
1934 A.C. Quadradyne (2SG, D, Pen)	Jan. '34	WM349
Lucerne Straight Four (SG, D, LF, Trans)	Feb. '34	WM350
Universal Merrymaker (A.C.-D.C. Super-het)		WM356
Five Valve		
Super-quality Five (2HF, D, RC, Trans)	May '33	WM320
New Class-B Five (SG, D, LF, Class-B)	Nov. '33	WM340
Class-B Quadradyne (2SG, D, LF, Class-B)	Dec. '33	WM344
Words and Music Radiogram (2HF, Det, QPP)	Feb. '33	WM307A
Six Valve		
Super-straight Six (2HF, SG Det, RC, Push-pull)	Nov. '33	WM339

PORTABLE

General-purpose Portable (SG, D, RC, Trans)	9.7.32	AW351
Midget Class-B Portable (SG, D, LF, Class-B)	20.5.33	AW389
Holiday Portable (SG, D, LF, Class-B)	1.7.33	AW393
Hikers' 2 (Det, Trans)	4.6.32	AW345
Hikers' Belt Set (Det, Trans)	21.7.34	AW441
Town and Country Four (SG, D, RC, Trans)	May '32	WM282
Spectrum Portable (SG, D, QP21)	Apr. '34	WM357
Two H.F. Portable (2SG, D, QP21)	June '34	WM363
Tyers Portable (SG, Det, 2 Trans)	Aug. '34	WM367

SUPER-HET

1934 Century Super (Battery)	9.12.33	AW413
1934 A.C. Century Super	10.3.34	AW425
The Etherdyne (Battery)	21.10.33	AW405
Super Senior	Oct. '31	WM256
Everybody's Portable (five-valve Super-het)	July '32	WM291
Seventy-seven Super (A.C.)	Dec. '32	WM305
Q.P.P. Super 60 (Battery)	Apr. '33	WM319
1932 Super 60 (Battery)	Jan. '32	WM269
1932 A.C. Super 60 (A.C.)	Feb. '32	WM272
"W.M." D.C. (Super-het)	May '33	WM321
Lucerne Super (Battery)	Mar. '34	WM355
Ideal Home Super (Battery)	Apr '32	WM280
Easytune 60 (Battery)	May '32	WM284
Ideal Home A.C. Super	July '32	WM290
Easytune for frame aerial	Nov '32	WM301
Merrymaker Super (A.C. mains)	Dec. '33	WM345
Universal Merrymaker	Apr. '34	WM356
Heptode Super Three (A.C. mains)	May '34	WM359
"W.M." Radiogram Super (A.C. mains)	July '34	WM366
Portable		
Everybody's Portable	July '32	WM291
Welcome Portable	May '33	WM322
Welcome Portable with class-B output	June '33	WM325

MISCELLANEOUS

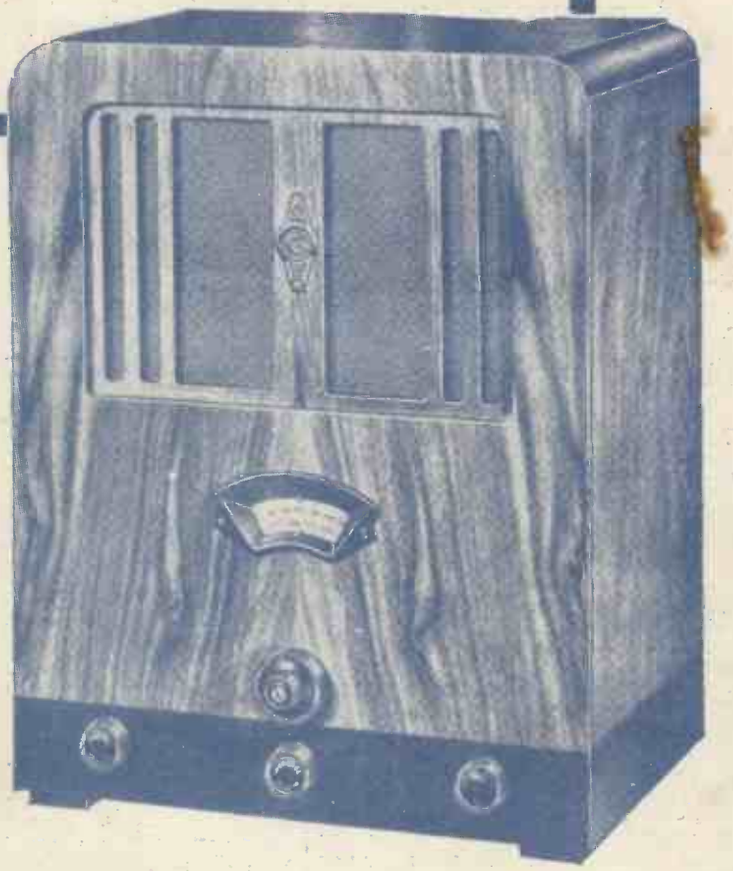
Universal Push-pull Amplifier	3.10.32	WA300
"A.W." Record Player (LF, Push-pull)	5.12.31	AW319
Battery-operated Amplifier	22.10.32	AW362
"A.W.'s" Push-pull Amplifier	11.3.33	AW376
Class-B Gramophone Amplifier	10.6.33	AW391
Universal A.C. Amplifier (3-valve)	18.11.33	AW411
Five Q.P.P. Output Circuits	Mar. '33	WM315
"A.W." Trickle Charger	16.7.32	AW352
Add-on Band-pass Unit	10.9.32	AW359
Plug-in Short-wave Adaptor	18.2.33	AW382
Experimenters' D.C. Mains Unit	7.4.34	AW430
Experimenters' A.C. Mains Unit	21.4.34	AW432
Short-wave Plug-in Adaptor	23.1.32	AW326
Short-wave Super-het Converter	23.1.32	AW329
1932 Ether Searcher Radiogram Motor board	6.2.32	AW333
Mains Unit and Loud-speaker details of Home Lovers All-Electric 3	5.3.32	AW335A
"A.W." Short-wave Adaptor	9.4.32	AW339
Mascot Mains Unit	2.7.32	AW350
Simple Trickle Charger	16.7.32	AW352
New Century Super Short-wave Adaptor	19.11.32	AW367
D.C. High-tension Unit	26.11.32	AW369
A.C. High-tension Adaptor	26.11.32	AW369A
Band-pass H.F. Unit	12.11.32	AW373
"A.W." Push-pull Amplifier	11.2.33	AW376
Wave-meter for 12-2,000 metres	25.2.33	AW379
Short-wave Adaptor	18.3.33	AW382
Super-het Short-wave Adaptor	8.4.33	AW385
Three Class-B Units	2.9.33	AW400
"A.W." Simple Television Receiver	9.9.33	AW401
Cathode-ray Exciter Unit	14.10.33	AW405
Cathode-ray Time Base	28.10.33	AW407
Television Amplifier (4-valve A.C. mains)	4.11.33	AW408
Cathode-ray Time Base (vert)	18.11.33	AW409
Valve and Set Tester	6.1.34	AW415
Exciter Unit (modified)	13.1.34	AW416
"A.W." Special Disc Receiver	11.11.33	
Class-B Mains Unit	June '33	WM324
A.C. Short-wave Converter	Mar. '34	WM353
10-watt A.C. Amplifier	June '34	WM360
10-watt D.C. Amplifier	June '34	WM361
Economy Gramophone Amplifier (3-valve, battery	Apr. '32	WM277
APA Radio Unit (2-valve)	May '32	WM281
Simple Mains Unit (A.C. mains)	May '32	WM283
Short-wave Director	June '32	WM285
Voltage Divider	June '32	WM287
Dual-speaker Amplifier (3-valve, A.C. mains)	Nov. '32	WM304
A.C. Mains H.T. Unit	Jan. '33	WM310
Q.P.P. Output Units	Mar. '33	WM315
Television Receiver (Mirror drum)	Nov. '33	WM342
Time Bases for Cathode-ray Tube	Dec. '33	WM343
Power Unit for Time Bases (A.C.)	Dec. '33	WM346
Valve Voltmeter	28.7.34	AW442

SHORT-WAVE

One Valve		
S.W. One-valver for America	31.3.34	AW427
Short-wave One-valve	23.1.32	AW329
Portable Short-wave One	6.7.32	AW354
Two Valve		
Home-made Coil Two (Det, Pen)	14.7.34	AW440
W.M. Bandspread Short-waver (HF Pen Det, Pen) A.C./D.C.	Aug. '34	WM368
Three Valve		
World-wide Short-wave 3 (Det, RC, Trans)	6.2.32	AW332
World Ranger Short-wave 3 (Det, RC, Trans)	20.8.32	AW355
Experimenters 5-metre Set (Det, Trans, Super-regen)	30.6.34	AW438
Emigrator (SG, Det, Pen) A.C. mains	Feb. '34	WM352
Four Valve		
"A.W." Short-wave World Beater (HF, Pen, Det, RC, Trans)	2.6.34	AW436
Gold Coaster (SG, Det, RC, Trans), A.C. mains	Aug. '32	WM292
Home Short-waver (SG, Det, RC, Trans)	Feb. '33	WM311
Empire Short-waver (SG, Det, RC, Trans)	Mar. '33	WM318
Super-het		
"W.M." Short-wave Super (Battery)	Nov. '32	WM302

Prices: Crystal Sets, 6d.; One-, Two-, and Three-valvers, 1s.; Four Valves and more, 1s. 6d.; Most of the Blueprints listed under "Miscellaneous" are 1s. each

THE EVENT OF THE YEAR....



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