

The

6^p

SHORT-WAVE MAGAZINE

*This issue
contains full
particulars of the
"Ideal"
Receiver.*

No. 7

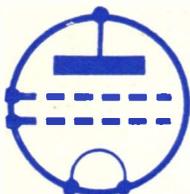
SEPTEMBER,
1937

With 16pp.
Radiolympia
Supplement

VALVE DEVELOPMENT

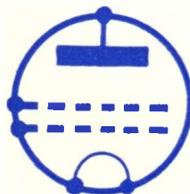
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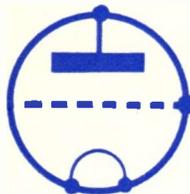
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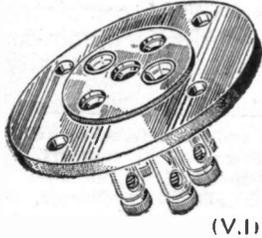
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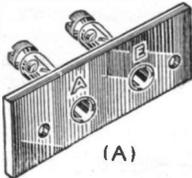
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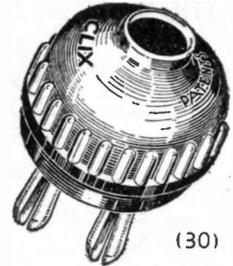
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Clix perfect contacts are used and specified for
THE "IDEAL" RECEIVER,
which is fully described in this issue.

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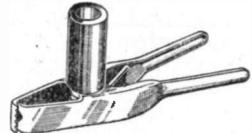
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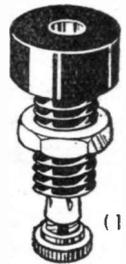
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BRITISH MECHANICAL PRODUCTIONS LIMITED
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THE SHORT-WAVE MAGAZINE

Vol. 1

SEPTEMBER 1937

No. 7

Editor: BASIL WARDMAN (G5CQ)

Editorial Asst.: S. W. CLARK

Advertisement Manager: C. T. MILDENHALL

RADIOLYMPIA

Once more Radiolympia is here, introducing the new season's receivers and components. Whereas a few years ago short waves were neglected by the majority of manufacturers, to-day practically every one is exhibiting some short-wave product.

Credit is due to British manufacturers in that they did not rush into short waves early in their development. They have concentrated on products suitable for everyday use: for the listener who merely requires short waves for additional programmes as well as for the ardent experimenter.

Radiolympia proves their success, products of unequalled performance and manufacture.

THE "IDEAL" RECEIVER

A short time ago we invited readers to put forward their ideas of the features they considered necessary in a short-wave receiver. From these suggestions we intended to produce a receiver incorporating as many of these features as were possible or desirable.

The correspondence indicated that there was approximately an equal balance between those who wished for a "straight" set and those who preferred a superhet.

To satisfy all, if possible, we decided to produce a model of each class, both for battery and mains use. The first of these, the "Ideal" Straight Receiver, for battery use, is described in this issue.

The home constructor will find in this receiver all the refinements for which he has longed, combined with ease of construction and low cost.

We do not intend to praise this effort: rather would we say that it is built for performance on sound engineering principles. Let it be judged on its merits, not on our praise. You are the judges.

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Contributions for publication in our editorial pages will be given consideration and payment will be made for matter used. Only manuscript accompanied by a stamped, addressed envelope will be returned. Whilst we are willing to advise on suggested articles no guarantee of acceptance can be given.

The publisher does not necessarily agree with the views expressed by all correspondents and contributors, the aim being to open the columns to every phase of opinion.

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AN AMATEUR GOES ABROAD

“ . . . if these war-mongers had a hobby like ours . . . all this talk of world-war would soon cease.”

By ARTHUR C. GEE (G2UK)

ONE OF THE delights of amateur radio is that should one have occasion to travel in foreign lands, he has only to look up a fellow ham to find a friend after his own heart, hospitality and social intercourse.

The writer has returned from South America and during the course of his travels was fortunate in meeting quite a number of the Argentine and Brazilian “gang.”

On arriving in Buenos Aires I lost no time in hunting up the Radio Club del Argentina. One evening I found a dozen or so of the members present and the transmitter on the air. Some difficulty arose at first as I am unable to speak Spanish and none of those present could speak English. However a QSL card soon explained my mission and I was given that enthusiastic welcome so characteristic of ham radio. The timely arrival of Senor Guerrini (LU9AX) who speaks excellent English helped matters considerably and after greetings and introductions all round I was escorted round the club's premises.

● First Call—Buenos Aires

The Radio Club del Argentina boasts a very fine headquarters. It occupies the whole of the first floor of a building in the “west end” of the city. In the entrance hall are offices, QSL section and quite an interesting museum, with photographs of old QRA's, gear, etc. Adjoining the entrance hall is a reading room where all current Spanish radio literature is to be found and members may here spend a quiet evening reading or writing.

The club operates a transmitter under the call LU9AA. This transmitter is a very fine commercially-built job having a final input of 500 watts fone or c.w. The receiver is also commercially built and the gear is installed in a small room set apart for the purpose. Unfortunately local electrical QRM is very bad and difficulty is experienced in working much dx.

I must say I was very impressed indeed with the headquarters of the club and congratulated Senor Guerrini—this year's president—and all its members on their excellent premises.

On the following Saturday Senor Guerrini very kindly asked me round to his QRA to inspect his gear and have tea. As was to be expected I had a very pleasant and interesting time; his QRA is well out of the town and free from man-made static. We hoped to contact a “G” station on 28 mc. but unfortunately, either because of con-

ditions or because it happened to be National Field Day week-end, none of my countrymen were to be heard. LU9AX works exclusively on ten and five metres. The gear at present is in the experimental stage and, as always seems the case when a fellow ham comes along, its gear was somewhat “hay-wire.” However, a new transmitter is in course of construction and to all appearances is going to be a very fine job indeed. The present rig is a four-stage job—7 mc. c.o., f.d., f.d., p.a., with an input to the final of 50 watts, fone or c.w. The receiver is a 2 h.f., det., l.f. commercial job, re-doped for 28 mc.

● 5-Metre Keeness

LU9AX is the first Argentine station to w.a.c. on 28 mc. The stations worked were:—HJ3AJH (Colombia, S. America), ZL1CD, W6GRX, J2IS, ZS1H and G6LK. For this success he was presented with a silver medal by the club, bearing the Spanish equivalent of “First Argentine Station to w.a.c. on 28 mc.” on one side and his call sign on the other.

Over tea we discussed amateur radio in the Argentine and I learned that the chief interest at the moment is 56 mc. work. Until three months ago there were no stations active on this band; there are now thirty-two in Buenos Aires alone. Self-excited transmitters and super-regenerative receivers are the most popular, but as experience with these increases it is hoped to advance to more stable gear. After tea I listened to the very active local 56 mc. transmitters on the air. The signals had plenty of punch in them and the quality of all I heard was very good. The best 56 mc. dx so far in the Argentine is from Montevideo to the centre of Buenos Aires—a distance of four hundred kilometres. This is for receiving only; two-way contact between these points not yet having been established. Senor Guerrini also told me that the television transmissions from Alexandra Palace have been picked up in Buenos Aires on more than one occasion.

● A Friendship Renewed at Santos

An exchange of photos and QSL cards brought my visit to an end and the next morning I sailed for Santos in Brazil. Here I found PY2AJ—Dr. Baccaret, a personal friend of Senor Guerrini's. The latter had informed PY2AJ over the air of my intended visit and when I called he was, so to speak, waiting for me. Dr. Baccaret also speaks English

so I at once felt at ease, and it was not long before we felt we had known each other for years. I had worked him over the air on 14 mc. before leaving England and it was interesting to see the inside of his shack and the gear of a real dx station. I had not been in the house long before we found ourselves in a room on the ground floor of the house set aside as the radio room. The transmitter was warming up and the receiver switched on. PY2AJ has a flare for dx; he works 14 mc. c.w. only, using an input to the final of 100 watts. The transmitter is a four-stage rack-and-panel job consisting of crystal oscillator, frequency doubler, sub-amplifier, and power amplifier. The receiver is very interesting indeed: a three-valve superhet, home-built and has a finish which rivals that of a commercial.

We got the gear going and worked several "W's" but could not raise any "G" stations. PY2AJ is the probable winner of the recent Brazilian dx contest; his log runs to many pages and his signals seem to have got out well into the four corners of the earth. In the event of the final summing up proving him to be the winner he will become the proud owner of a Hammarlund Comet Pro. Over the customary coffee we talked ham radio and once again I heard the sad tale of QRM, QRM, and more QRM. Fone stations in Brazil are even more powerful than those in the States and the c.w. dx worker has a hard time trying to find a clear spot for himself. We talked of many other things—the Revolution in 1932 when PY2AJ took on the post of Director of Communications and subsequently found himself in jail for his services! He described to me too how quartz is sent all over the world from the quartz mines of Brazil to be made into optical prisms and lenses, and crystals for radio work. PY2AJ had on his desk a very fine piece of this quartz, weighing about two pounds, and very generously presented this to me as a souvenir of my visit to his QRA—a souvenir which was much appreciated.

With promises to listen to each other over the air we wished one another 73's, and after farewells PY2AJ returned to his dx'ing and I to my ship—sailing that evening for Rio de Janeiro.

● A Short Stay at Rio—

Rio de Janeiro is a most delightful city, built on the banks of what is almost a perfect natural harbour. Unfortunately my stay had to be short, being limited to a few hours only. As soon as we had tied up alongside the quay I made for the headquarters of the Brazilian Radio Club—the L.A.B.R.E., i.e., the "Liga de Amadores Brasileiros de Radio Emissao."

The premises here consist chiefly of office accommodation. I found the office in charge of PY1GJ—Antonio Correia da Costa. Once again the language difficulty had to be overcome and this time it was done in a rather unique way: PY1GJ produced a sheet of paper and pencil and beckoned to me to sit at a table beside him. Our QSO started by

PY1GJ writing on the paper, "Sa o.m. vry psed meet u!" to which I replied, "Sure vry psed meet u o.b. Vry sri no speak ur lingo hi." Back comes PY1GJ with, "All o.k. o.b. Pse ur 1st time Rio?" And so on, our radioese QSO going well. PY1GJ explained there was a doctor near by who spoke English and that he would ring him up on the phone and get him to come round to the office.

Before long Dr. Claudio Mello (PY1AU) put in an appearance and we all three made our way to a near-by café. We chatted together for some while, Dr. Mello acting as interpreter. The Doctor is a Professor at the University in Rio and he intends visiting England and Germany in the near future in connection with his professional studies. He hopes to meet some of the British hams during his stay in London. Both he and PY1GJ work chiefly on 7 mc. and so have not worked a great many "G" stations. PY1GJ has recently been testing out a new QRP circuit for local work and with an input of only five watts has been doing very well.

● —And Home!

Our refreshment ended PY1AU and PY1GJ accompanied me to the quay-side where my ship was flying the "Blue Peter" and preparing to leave. Farewells and hearty handshakes all round brought my short visit to Rio to an end and an hour later we were steaming out of the harbour, past the Sugar Loaf mountain, leaving that beautiful city behind.

Fourteen days later found us steaming slowly up the Thames bound for the Royal Albert Dock. As we berthed my eyes fell upon a newspaper vendor displaying a flysheet bearing the words "World-War Situation," "Grave Fears." I could not help thinking that if these war-mongers had a hobby like ours, where we can meet fellows of other lands on a common footing and understand each other through the same interests, all this talk of world-wars would soon cease.

Amateur radio activity in Brazil and the Argentine does not receive the attention it deserves, due possibly to the distance separating these countries from ours. Signals from stations in that part of the world are real dx and I can assure readers that any PY or LU station is always glad of a QSO or intelligent report on their signals.

VALVES AT TWO-THIRDS LIST PRICE.—We have still in hand a considerable number of valves of de-controlled types which are available at two-thirds of the list prices while stocks last. These include a practically full range of battery valves, AC types:—ACSG 4, ACFC 4, ACHL 4, ACPX 4 and ACME 4. For example:—HL 2, list price 3s. 6d., de-controlled price 2s. 4d. SG 2, list price 7s. 6d., de-controlled price 5s. 0d. ACPX 4, list price 9s. 0d., de-controlled price 6s. 0d.—THE 362 RADIO VALVE CO., LTD., 324/6, Liverpool Road, Highbury, N.7.

A FIELD STRENGTH METER FOR THE AMATEUR STATION

By A. J. DEVON

It is ONE thing to design and erect a transmitting aerial intended to give a particular radiation pattern, but quite a different matter to find out what is actually the shape of that pattern under working conditions, while at some time or other every amateur has had a desire to get an instrumental check on the behaviour of the aerial he happens to be using.

The Field Strength Meter described and illustrated herewith will do a great deal towards providing this information, and much useful and interesting work can be done with it. In fact, every properly equipped station should be provided with such an instrument, as it is practically indispensable for serious aerial tests. Some may cavil at the idea of having to buy an 0-1 ma. panel meter for the purpose, but it is not an extravagance when one remembers that a high-grade low-reading instrument of this type has endless useful applications of its own, and it is a simple matter to arrange the con-

nections so that, while it remains fixed on the F/S meter panel, it can be used independently for bench work.

● Circuit Considerations

Fig. 1 shows the circuit of the meter, a simple rectifier arrangement using a Hivac H210 valve connected as a diode and tapped across part of the tuned circuit C1-L. The radiation from the transmitter or off the aerial is picked up by a short length of wire taken off this tap. The rectified r.f. is registered on the milliammeter, the circuit being completed by the close-circuit jack J. Phones can be plugged in at this point for monitoring speech transmissions with the meter on the bench, C2 being the associated by-pass condenser. All six amateur bands are covered by means of three coils, wound on standard Eddystone formers, the inductance values being so arranged that two bands are brought on each coil with the .0001 mfd. condenser at C1.

It may be asked why a "Westector" has not been used for the rectifying element, since only diode action is required. The answer is because in the first place the current-handling capacity of these rectifiers—the smaller and less expensive ones ordinarily used as detectors—is not more than 0.5 ma., which is insufficient for the purpose, while secondly, a valve will stand without damage the over-loads, perhaps as much as 5 ma., which may be encountered. At the same time, it is not recommended that the milliammeter be operated permanently off-scale! The point is that a rectified current of one milliamp is well within the capacity of the valve, but is twice that allowable for the "Westector" WM.26, and four times the current-rating of the commoner W.4 or W.6.

● Filament Current

The only disadvantage in using a valve is, of course, the question of l.t. supply. Either long-life dry batteries can be employed, which means bulk and a larger screening box for carrying them, or some form of the usual l.t. accumulator. In this case, the Exide unspillable midget jelly-acid cell is used, type RDJ-1, which measures less than 2½ by 1 by 2½ inches, so that not only is the over-all size of the meter kept down, but the advantage of a rechargeable l.t. supply is retained. This cell has a capacity of 1.6 a.h., which is ample for any use to which the meter might be put between its fortnightly charges.

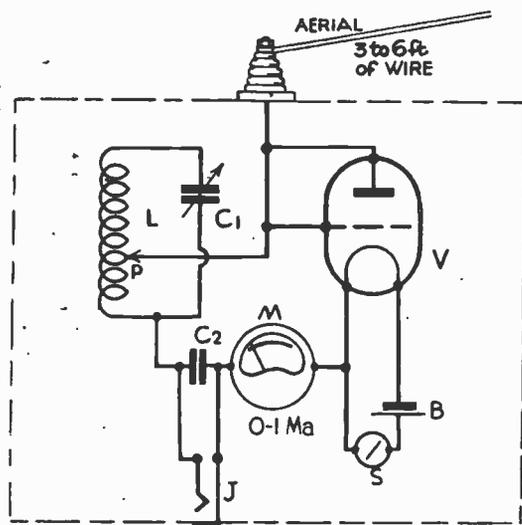


Fig. 1.

Circuit of field strength meter with diode rectifier. Complete screening is essential, and the circuit earths to the box through one side of the panel mounting jack J. A short piece of stiff wire attached to the stand-off insulator mounted on the side of the box serves as pick-up.

Since a field strength meter is essentially a portable instrument, the model illustrated has been made as light and compact as possible, and it is therefore advisable to use the parts specified in order to get them all in the box. Some may question the need of a slow-motion drive on the tuning condenser, but actually it is very necessary in order to get accurate tuning on the h.f. bands; apart from this, most well-made s.w. variable condensers are designed for a slow-motion control of some kind, and are rather too stiff to turn smoothly without it. Again, the fact that the condenser is not immediately behind the panel minimises capacity effects, which is another reason why the extension drive should be fitted.

● Constructional Points

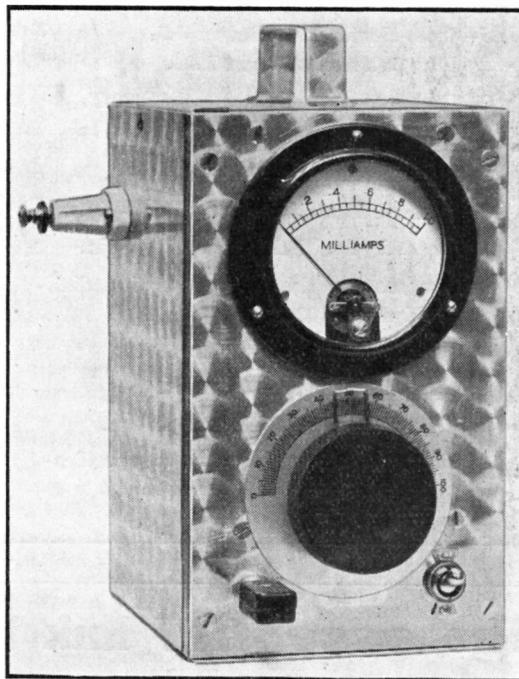
The photograph shows the general appearance of the instrument, while the necessary drilling is given in *Fig. 2*. It is important that this should be closely followed as the clearances, while being sufficient, do not allow much room for variation. A particular point is with regard to the coil- and valve-holders, which are Eddystone 4-pin chassis mounting type 953. These have part of the flange, opposite the anode pin, sawn off to flush up with the edge of the chassis and to allow room to get at the fixing screw which secures the bottom plate of the box. The slow-motion driving head, Eddystone type 1036, should be packed up behind the panel with washers in order to bring the cursor close to the dial. Then slip on the flexible coupler and tuning condenser, making sure they are well home, as there is a tendency for the shafts to stick halfway. This will fix the position of the variable condenser, which will be found to project a little beyond the chassis. A small mounting bracket should be cut for it from a piece of brass or aluminium, since the mounting height is considerably lower than that provided by a standard adjustable bracket. The aluminium mount is quite easily and quickly made out of a strip of metal 2 in. long by $\frac{3}{4}$ in. wide, bent at right angles to line up the condenser shaft with the coupler, and with the foot bolted to the chassis.

The box, which is $4\frac{1}{2}$ in. wide by 5 in. deep by $7\frac{1}{2}$ in. high and fitted with a carrying handle, is supplied ready-made, and drilled for the Sifam 0-1 ma. panel meter, by E. Paroussi. The extra drilling required can easily be followed from *Fig. 2*. A further point to notice is the battery mounting. The 2v. cell already mentioned is carried in a small holder—made from an odd piece of aluminium—shaped to hold the accumulator in an upright position, and bolted to the back panel. This is not only a safe method of carrying the cell, but it is conveniently accessible for charging.

● Coil Data

Inductance values for the six bands are as follows: 1.7 and 3.5 mc., 48 turns total, with tap P at 16th turn from "earthy" end; 7 and 14 mc., 12 turns, tapped 4th turn; 28 and 56 mc., 2 turns, tapped at the centre. The first coil is close-wound on a plain Eddystone former, type 935, and the

other two on threaded forms, type 936. The 7 and 14 mc. coil is spaced to follow the threading, but the 28-56 mc. one should be spread out to cover about $\frac{1}{2}$ in. winding space; some experiment will probably be necessary with the latter. No. 26 enamelled wire is used.



The various bands should be found to register near the top and bottom of the condenser scale with their respective coils; this can be checked from the receiver beforehand by attaching a length of flex to the stand-off insulator on the side of box and looping the other end round the detector coil in the receiver on the band on which it is desired to check. On swinging the tuning condenser, an effect similar to that obtained with an ordinary absorption wavemeter will be noted, which will enable any coil adjustments which may be necessary to be easily made.

In use, a length of stiff copper wire or light rod will give sufficient pick-up to obtain deflections on the meter, though the actual readings will naturally depend on the power used and the position of the instrument in the field of the aerial or transmitter. It will also be found that quite a loud signal is still present in the phones when there is no noticeable reading on the meter.

Next month, this article will be continued with a description of how the field strength meter can be used for testing the behaviour of transmitter and aerial, also indicating a few of its other possible but often unrealised applications.

For components list and drilling details see next page.

REQUIREMENTS

- V—Hivac H210.
- C1—.0001 mfd., Eddystone type 900/100.
- C2—.002 mfd., Dubilier 690W.
- J—Close-circuit jack, Bulgin J.7.
Plug to match, Bulgin P.38.
- S—On-off toggle switch, Bulgin S.80.T.
- B—2v. l.t. cell, Exide RDJ-1.
- 2 4-pin valveholders, Eddystone 953.
- 1 plain coil form, Eddystone 935, 4-pin.
- 2 threaded do. Eddystone 936, 4-pin.
- 1 Slow motion driving head, with dial,
Eddystone 1036.
- 1 Flexible coupler, Eddystone 1009.
- 1 Stand-off Insulator, Raymart.
- 1 0-1 ma. moving-coil meter. Sifam.
- Aluminium chassis and box to specifica-
tion, E. Paroussi.

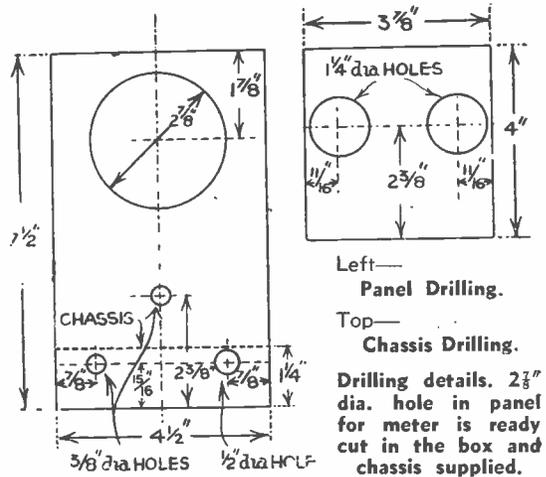


Fig. 2.

Left—
Panel Drilling.

Top—
Chassis Drilling.

Drilling details. 2 3/8" dia. hole in panel for meter is ready cut in the box and chassis supplied.

QUERIES

Answers to any problem relating to short-wave radio are offered free to our readers.

All enquiries must be sent with the coupon cut from page 32 and addressed to "The Editor, The Short-Wave Magazine, 84-86 Tabernacle Street, London, E.C.2." A stamped addressed envelope must accompany all correspondence.

The essential link in Short-wave listening —YOUR HEADPHONES they simply must be



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Charles Wheeler's

AUGUST LOG

At LAST summer seems to have come (it has been nearly 90° here), and with it real summer radio conditions—mostly lots and lots of static, and nothing doing on the longer waves.

● VK3LR

The Australian Broadcasting Commission's station verifies by letter and sends a programme sheet. News is given at 12.30 GMT daily except Sundays, and at 09.40 from Monday to Friday. They state that transmission 2, directed to Malaya, has been suspended: this was transmitted between 06.30 and 07.30 GMT. Unfortunately it was during this session that VK3LR was best heard in England. The station's address is: Australian Broadcasting Commission, Short-Wave Division, Box 1686, G.P.O., Melbourne.

This is the Australian racing season, and exciting commentaries were given from the race meetings at Ballarat.

The recent disturbances in North China have created considerable interest in Far Eastern broadcasting. I have been unable to get a station giving the Chinese version of the affair, but the Japanese news is still one of the star turns to be pulled in on a short-wave receiver.

JZK's schedule has been altered, and is now from 20.00 to 21.00 GMT. News is given at the beginning of the transmission.

Another Japanese station, which is well heard, is JVA. This commercial is used in the European phone links. While testing with Geneva a few weeks ago, the question of modulation and quality arose, so quite a good selection of gramophone records followed.

Another telephone link to be heard about 07.00 or 08.00 is that between Cape Town and London. The South African station is ZSS, belonging to Overseas Communications of South Africa, Ltd., while at this end GAQ, Rugby, is heard.

When the two stations in communication use frequencies as close as these it is quite easy to switch from one to the other and follow the conversation.

● News from Siam

Many a time I have heard HSP using Morse on a frequency of 17.74 mc., but it was not until about a fortnight ago that their phone was received here. At 14.30 on July 30 they were calling Berlin, using English, as most Eastern stations do when contacting Europe. You can easily find HSP, and recognise it by a very harsh spreading note.

A veri. from HS8PJ gives their schedule on 19.02 mc. as 13.00-15.00 Mondays, and the output as 5 kw. HS8PJ is situated at Saladeng, near Bangkok.

The card was signed by Lt.-Col. Phra Aram, whose signature also appeared on 1PJ's card.

Another new Siamese station heard on about 14,100 kc. is HS1BJ, who is operating as an amateur.

YDC, the Javanese broadcaster, has increased schedule and is now on until 15.00 GMT. The extra hour has made a considerable difference, and by 15.00 YDC is usually loud enough to be 100 per cent. intelligible and free from interference. The N.I.R.O.M. programmes are mostly English and American dance bands, etc., but as yet no announcements are made in English.

By the way, do you know that N.I.R.O.M. stands for Nederlandsche Indische Radio Omroep Maatschaapij?

As mentioned in last month's station identification panels, COCQ verifies promptly. The card design shows a very imposing aerial array, and the station slogan, "Nonne quiera que hayo un radio re oye la CMQ." CMQ is the medium waver which COCQ relays. The photographs are described as one of the station's transmitters.

● Spain

No doubt you have heard "la EA9AH, Tetuan," who roars in on 14,000 kc., sometimes with news, sometimes with an amateur call. The operator's name is Fernando Diaz Gomez, and his QRA Apar-tado 124. His card bears the Spanish royal coat-of-arms, and with it is sent a pamphlet entitled "Our National Movement," headed by an extract from one of General Franco's speeches, and concluding with "This is the synthesis of our glorious and sublime National Movement."

The Spanish war stations are still to be heard on the amateur bands, using calls no government or convention ever sanctioned. EAQ2 is now using the call EAR.

On Saturday evenings the League of Nations transmitters give news and musical programmes with English announcements at 22.15.

2RO, the D's, CT1AA, and other locals are all coming through clearly, while their corresponding medium-wave outlets are snowed up (?) with QRN.

The same can be said of the Americans, for although no one would try to look for WGY and KDKA this time of the year, 2XAD and 8XK are coming in well.

The new American, W2XGB, does not seem to have settled down to any regular transmission times. He comes in on and off between 15.00 and 18.30, usually with a very loud signal. If he does settle down, we shall have another good American "programme" station.

(Continued on page 11.)

N.R.S. PROGRESS

By *LESLIE W. ORTON, Secretary*

THE NATIONAL Radio Society has bounded into popularity with surprising speed. Members have already been enrolled in most of the counties of this country as well as in Ireland. And here I would like to express thanks to those who have made this possible. Firstly to the Editor of *THE SHORT-WAVE MAGAZINE*, secondly to the clubs and members, county representatives, etc., who have all done their bit—often a big bit—to help.

● Free Membership

Has it ever occurred to you that many who would like to enjoy the advantages of joining a club are unable to do so through no fault of their own? The unemployed, the blind and bed-ridden are often hard put to to make both ends meet, yet membership in a dx club would add a touch of happiness to their rather drab (of necessity) lives. Consequently the NRS decided to do something about it and we have great pleasure in announcing our free—and reduced—membership plan.

In the case of blind and bed-ridden (permanent or for a number of years) enthusiasts membership is free and the Lancs. News Sheet may be obtained at half-price (6d. per annum).

Enthusiasts who have been unemployed for more than two years may be enrolled at half-price—6d.—per annum. Postage must be enclosed in all cases where replies are desired, whether you belong to the blind, unemployed or general members.

So, if you come into the above category will you send your applications to me at 11, Hawthorn Drive, Willowbank, Uxbridge? Your application will be forwarded to the nearest county, or local, representative and he has the right to investigate any claims if he sees fit.

Unemployed members may be assured that should opportunity of work of his nature be required by fellow members in his district he will be notified accordingly. As soon as an unemployed member is employed he must notify H.Q. And so, all of you, join up and let's be one merry gang.

● Telephone Service

The station identification bureau is extremely busy and members in the North are reminded that Mr. Albert Park, Lancs. representative, will be pleased to answer their station queries for them.

In the South a special telephone service is now available. Any member requiring to identify an amateur station's address may telephone UXBRIDGE 821 between 9 and 10 a.m. ONLY—please note the only, otherwise you lose your cash! When

phoning ask for me and then give the call—or calls—of the stations, and if at all possible I'll supply the answers.

● County Reps.

And now you may wonder who your county rep. is. To ease your aching heart I'll give a list. If you have no representative in your district apply to the nearest.

NRS3.—F. CHAPMAN, 34, Birkbeck Road, Sidcup, KENT.

NSS4.—G. C. CASTLE, 10, Henry Street, Gosforth, Newcastle-on-Tyne, NORTHUMBERLAND & DURHAM.

NRS5.—E. W. J. FIELD, 36, Watford Heath, Watford, HERTS.

NRS6.—ALBERT PARK, 14, Fairfax Road, Prestwich, Manchester, LANCs. QSL Bureau.

NSS8.—G. F. SHEPHERD, 287, Wragley Road, LINCOLN.

NRS10.—JACK HUGHES, 11, Nelson Street, Coventry, WARWICK.

NRS11.—C. R. THOMPSON, The Chestnuts, Orford, Woodbridge, SUFFOLK.

NRS12.—C. F. BRIGGS, 86, Lordship Lane, Tottenham, N.17, N. LONDON.

NRS14.—R. S. STEVENS, 43, Pettits Lane, Romford, ESSEX.

NRS15.—C. J. L. GOLDSWORTHY, 24, Penrith Street, Streatham, S.W.16, SOUTH LONDON.

NRS75.—J. G. WHITE, 18, St. David's Terrace, North Circular Road, DUBLIN, I.F.S.

NRS42.—H. ARNFIELD, 7, Hurst Lea Road, New Mills, near Stockport, CHESHIRE.

NRS108.—A. F. LAMBOURNE, G5AO, 31, Baker Street, Reading, BERKS.

NRS118.—T. C. FROSTICK, 30, Woodside Terrace, Hailey Hill, Halifax, YORKS.

NRS148.—T. L. STEVENS, 2CCS, Post Office, Donnington Wood, Wellington, SHROPSHIRE.

NRS151.—E. J. EWING, 44, Fitzjohn Avenue, Barnet, Herts. BARNET TOWN.

If any of you dx'ers would care to represent us will you let me know? I'm looking for willing helpers.

● News Sheets

The Lancs. Branch issued its first News Sheet at the beginning of August. Particulars may be obtained from the Lancs. rep. Might I also remind you of the NRS QSL Bureau also run by Mr. Park?

Incidentally, several members have enquired as to the advantages of such a bureau. Well, it saves considerable amounts in cash.

The Essex County is considering the publication of a News Sheet—will all interested please communicate with Mr. Stevens.

Many enquiries have arrived asking whether H.Q. will issue a news-sheet. We have considered the matter but have so far not arrived at a definite decision. Members' opinions will be welcomed.

● Odd Items

And now for a few odd items. Mr. R. Pearce (NRS28) of Norbury, has accepted a position on the NRS council.

We have pleasure in publishing the request of Mr. F. H. Rickett (NRS21) of 28, Cross Oak Road, Berkhamsted, Herts, for circuits to include in the WFSRA Circuit Service—sorry lack of space resulted in this note being missed in our last issue, o.m.

Our Berks rep. (A. F. Lambourne) NRS 108, reminds NRS members that they may obtain particulars of the Reading and District Transmitting and Relay Society from him.

In view of experiments we propose to conduct I will be pleased to hear from transmitting "hams" who would be willing to co-operate in receiving-transmitting tests.

● Branches

We know many of you members are dying to speak to fellow-members and are consequently doing our best to form branches. Newcastle members should apply to our Northumberland and Durham rep. Will Warwickshire and Essex members please write to their representatives, when they will hear something of interest.

Well, boys, I'm afraid my space is running short, and so I'll conclude with reminding you that our membership paper is obtainable at 2s. 6d. per 100 sheets, 1s. 6d. for 50 sheets—and well worth it. We have received many enthusiastic letters praising it, we thank you all.

● Last-Minute Jottings

A little extra space than I had believed is at my disposal and so I'll fill it with as much of interest as possible.

Firstly I would like to introduce our Cornwall representative to you—Mr. Jack Ellery, 16, King Street, Lostwithiel, NRS192. Will Cornwall listeners please communicate with him?

We have pleasure in announcing that the NRS now has members in India, South Africa and the I.F.S.

Our I.F.S. Rep. announces that a Dublin Branch N.R.S. has been formed. Meetings are held at 8 p.m. every Wednesday. Morse classes are also being

held and it is hoped to get a transmitter shortly. Details from I.F.S. Rep. NRS.

Mr. D. P. Robinson, of 24, Kingsway, Crewe, is anxious to hear from readers interested in the formation of an NRS Branch there.

Now I'd like to thank members for the many station lists they have sent along. Unfortunately there is not space at my disposal to publish them—THE SHORT-WAVE MAGAZINE would require to be twice the size to publish them all! Well, lads, I'm looking forward to your entries in the short-wave contest—send along "veries" and QSL cards and a stamp-addressed envelope for their return.

And now, if any would like to become town or county representatives will you please let me know? We are anxious to give all our members good service and to form branches where possible—your co-operation will be appreciated. And so now I'll say "cheerio" and 73 until next month. NRS1 signing off.

"CHARLES WHEELER'S LOG"—*cont. from p. 9.*

For the next month or so there will be little use in searching for South Americans (or anything else) about 40 m., but the 31 m. channels are not greatly affected. HJ1ABP is still the most reliable station there, while COCQ and OAX4I are heard well at times.

VK2ME, once the great attraction of 31 m. has not been heard at all this month, yet on the 20 m. amateur band there have been numerous VK's nearly every morning.

● Amateurs

As a whole, 20 metres has provided more interest than any other band. In the early evening South Africans and Asiatics are quite frequently received, sometimes on phone. VS2AK, Kuala Lumpur, and VS1AJ have both come over extremely well. ZS6AJ and ZT2B have represented South Africa, and J8CF Korea. In the early morning there have been a few W6's and 7's, but not as many as last year; K6NZQ has been the only Hawaiian phone.

Two countries I had not heard until this month are Iraq and French Equatorial Africa; but now YI2BA and FQ8AB are in my log.

I was very surprised to hear the call of a powerful c.w. station on about 45 m. given as KON, one morning about a month ago. According to the latest lists, it belongs to the Nakat Packing Corporation at Union Bay, Alaska. A K7 on 6.5 mc.!

When searching for commercial phones have you ever realised how useful a knowledge of Morse is? Most of these stations send their call for hours on end at some time or another, and it eliminates searching when you have already found the station's dial setting. Then again, if you know a particular station is heard at a certain point, then you hear some scrambled speech there, ten chances to one it is your station.

If some of you will send me extracts from your broadcast station logs, it will be interesting to compare reception in different parts of the country.

Reflected Waves and Side-splash

in other words—All Sorts of Things

FROM MY EARLIEST experience of journalism I became convinced that the bulk of letters received by editors and columnists came from people with grievances, cranks and publicity-seekers. That was probably true of a section of the public I then wrote for, but happily it does in no way apply to the readers I address through this magazine. On the contrary, all the correspondence I have received from readers has been of the friendliest nature, further proving my contention that a very real spirit of good fellowship exists among short-wave fans. I invariably reply to my correspondents direct as I feel it would be unfair to use this space for anything other than matters of general interest. If I have been a little tardy in replying recently it has been due to the holidays in the first instance, and latterly to preparations for a busy season. However, by the time this appears I hope to have completely wiped off the arrears.

● Which grade are you ?

The outstanding feature of letters received, to me at least, has been the very evident variety of readers' particular interests. Some are chiefly interested in the constructional side, others in dx listening; then there is the experimenter, the novice experimenting his first s.w. thrills, and those ranging from a.a. licence holders to the most advanced ham. It must be very gratifying to our Editor to find that his declared endeavour to cater for all has met with so much success.

It occurs to me that, despite our passion for carefully classifying everything else connected with our hobby, we have never classified ourselves, and thus we have nothing to describe the intermediate stages from b.c.l. to ham. Why not apply the R code principle? For instance, N (for Novice) graduated from 1 to 9, C1 to C9 for constructors, and so on. It would save a lot of wordy explanation, the one drawback being our natural modesty as we should have to grade ourselves and no one would claim to be more than a 3 or 4 of anything.

● Straight and Superhet

In recent years radio developments have proceeded rapidly; often before one phase has been fully digested by the experimenter the next has been upon him. Broadcast receiver design has become more or less stabilised, but s.w. receivers are still passing through a series of metamorphoses—that is of course, assuming that ultimately one particular type of s.w. receiver will predominate. Apart from natural progress, receiver design has to

continually adjust itself to changing conditions. With the comparatively leisured development of early broadcasting, changes were slow—in fact many types of sets were in favour for long periods at the same time, each with its own group of adherents.

With increasing tempo more severe demands gradually weeded out the less efficient until the struggle culminated in the superhet displacing the straight 3- or 4-valver from the throne of popular favour. There is nothing to indicate that the superhet will ever be superseded in the broadcast field but in the short-wave world the straight has virtues that will not easily be eclipsed. The rival camps of straight and superhet supporters are, as instanced by the recent SHORT-WAVE MAGAZINE ballot, numerically about equal. I take neither side, but I rejoice in the fact that it will be a long time yet before s.w. receivers become "standardised."

● Valves

It was some time after the birth of broadcasting that anyone thought of designing receiving valves for special purposes. One type of valve did for everything. Indeed the Mullard valves of that period were called ORA because (taking the initial letter of each) they oscillated, rectified and amplified, and at that time the amateur just didn't ask for more. We were still using headphones and the only loudspeakers we knew were simply earpieces with a metal trumpet balanced on top. An effort was made to find a more truly descriptive term in our radio nomenclature by calling this contrivance a table-talker, but the term loudspeaker remains with us to-day except that more often than not we clip off the "loud" part of the title. It is rather remarkable that the word "speaker" has survived considering that it delivers far more music than speech to the ordinary listener (except when listening to B.B.C. transmissions), but that is by the way.

I believe the first valves to be marketed for special purposes were made by Cossors. Outwardly looking the same, a dab of red or green at the top of the glass envelope indicated that the valve was either (a) a good detector or h.f. valve, or (b) a good l.f. amplifier, I forget which. Many amateurs unkindly hinted that the valves were just made and after being tested were simply marked with the appropriate colour according to their characteristics. While, of course, it is possible that the difference was first noticed by accidental variation in electrode spacing in the manufacture, Cossors and other valve manufacturers quickly realised that there was a very definite need for special-purpose valves in domestic listening.

Thus, purse permitting, we were able to build multi-valvers which would give more or less intelligible speech through those crazy speakers, despite the fact that our inter-valve transformers were still little better than those used for early Morse "note magnifiers" where high amplification was all we demanded.

● An interesting sideline

The subject of valves reminds me that Mr. C. E. Largen (hon. sec. of the Ilford and District Radio Society) has a private museum of valves containing nearly 3,000 specimens ranging from early single plate andions to the latest 1937 types. He started collecting about seven years ago with the object of showing the progress in design and became absorbed in collating data on both progress and patent history. From his own junk-box and a well-responded-to appeal to friends he soon had an excellent foundation for his present collection which is arranged in glass-fronted cases, fully labelled and indexed.

This museum includes many early type transmitting valves but there are still certain types (tx and rx) which Mr. Largen seeks, and he will be grateful if any readers are able to assist him in his search for Fleming diodes, French horned valves or other early types.

● Warm work!

Recently I have been looking over some early popular radio journals (some of which have long since disappeared from the bookstalls) and was greatly amused at certain articles explaining with much detail things which to-day would be considered mere general knowledge. At that period it was quite usual to find articles such as "How to solder successfully," etc., appearing at regular intervals. To-day the old hand can solder when blindfolded and a new generation has sprung up to whom such things come quite naturally. However that sort of stuff, complete with pictures illustrating (a) the iron, (b) the grip, (c) the solder, etc., was definitely in demand at the beginning of the popular home construction period.

Nowadays we have the advantage of electric irons and soldering tags, the latter, strangely enough, were not used in those early days. Beginners usually tried to use the iron before it was hot enough, and then heating it more, burnt the tinning off. More often than not the work was not properly cleaned and without tags it was awkward to solder thick wire direct to terminals. Zealous constructors spent whole evenings getting hot and bothered (physically as well as mentally) to produce a few blobby joints which became unstuck at the first touch, often managing to use a whole stick of solder in the process.

● Another want

A reader writes concerning the time he is compelled to waste in calibrating coils and requesting

me to urge component manufacturers to supply coils wound on standard 4- and 6-pin formers which, if necessary with their own condenser combination, would *definitely* cover the stated band. He mentions that it is usually his experience to find that many hours' work is necessary to ensure that coils listed to tune from, say 9 metres (after allowing for circuit differences) will not get down, or even near, to that wave.

Feeling that there must be many others like himself who have neither the time nor the inclination to adjust the winding a bit at a time, he considers that manufacturers could profitably wind such coils on standard formers. I realise there are many amateurs who really enjoy this form of job but this reader is certainly far from being an isolated case in this respect, and so for their sakes Mr. Manufacturer I would draw your attention to this plea.

● Tall Tail-piece

During the boom period in home construction all sorts and conditions of people entered into the retail side of the wireless industry, and in every group of shops there appeared at least one radio store. Electrical and gas fitting shops, gramophone and cycle dealers, etc., were early in the field, later to be augmented by enterprising barbers' assistants, tradesmen's lads and others without the flimsiest qualifications—the handyman became the wireless "expert" almost overnight. The new racket was quickly overcrowded and the cut-price element came in hot and strong.

This chaotic state of affairs resulted in the technical ignorance of dealers generally becoming a byword and many funny stories of their strange statements and mistakes have been told. Fortunately, there have always been a number of shops run and staffed by first-class radio men but even to-day the technical ignorance of some so-called radio dealers is deplorable. Even many of the early "bad old" shops still exist, having found a new lease of life in retailing factory-made b.c.l. sets, and when these, the sets of course, go wrong you hear of some positively amazing things done in the name of servicing.

A neighbour of mine called in a service man of this ilk to remedy a simple defect—he managed, among other things, to fuse the lights, scar the dining-room table with his soldering iron, and finally have to send the set back to the factory for overhaul, which it must have pretty badly needed by that time. Yet the following story concerning a salesman is just a bit too tall. It alleges that in replying to a question regarding selectivity he assured the customer that "the set was so sharp that when a duet was on you could very nearly tune out the sound of either of the voices if you didn't like it."

I think that will do for this month.

Gene Lap.

BROADCAST PROGRAMMES FOR SEPTEMBER

(a) W2XE (Wayne)	21,520 kc, 13.9 m.	(h) 2RO (Rome)	11,810 kc, 25.40 m.
(b) "	15,270 kc, 19.6 m.	(i) W2XE (Wayne)	11,830 kc, 31.13 m.
(c) W2XAD (Schenectady)	15,330 kc, 19.5 m.	(j) TPA2 (Paris)	15,243 kc, 19.68 m.
(d) W3XAU (Philadelphia)	9,590 kc, 31.2 m.	(k) TPA3	11,885 kc, 25.27 m.
(e) "	6,060 kc, 49.5 m.	(l) TPA4	11,720 kc, 25.60 m.
(f) W3XAL (Boundbrook)	17,780 kc, 16.8 m.	(m) WIXAL (Boston)	11,790 kc, 25.45 m.
(g) W2XAF (Schenectady)	9,530 kc, 31.5 m.	(n) "	6,040 kc, 49.67 m.
		(o) OLR4A (Praha)	11,840 kc, 25.34 m.

SUNDAY

- a.m.
- 9.15 News in French, English and Italian (daily) (k)
 - 11.00 Concert—relayed (daily) (j)
- p.m.
- 12.00 News in English (daily) (j)
 - 12.15 Concert—relayed (daily) (j)
 - 12.45 Various Programmes from Italian Stations (daily) (h)
 - 1.00 Organ Reveille (a)
 - 1.30 Lyric Serenade (a)
 - 1.45 Radio Spotlight—The Week in Preview and News of the Stars (a)
 - 2.00 "Coast to Coast on a Bus"—programme for Children with Milton Cross (f)
 - 3.00 "Sunday at Aunt Susan's"—Children's Programme (a)
 - 2.20 Mediterranean Hour (daily) (h)
 - 2.20 Gramophone Records (daily) (j)
 - 2.30 Concert—relayed (daily) (j)
 - 2.55 Press Radio News (a)
 - 3.00 Russian Melodies, directed by Alexander Kiriloff (f)
 - 3.00 Church of the Air (a)
 - 3.30 Walburg Brown, String Ensemble (f)
 - 3.30 Children's Hour (a)
 - 4.00 Press Radio News (f)
 - 4.20 Varied Programme for Italian East Africa (h)
 - 5.00 The Hour Glass (c)
 - 5.00 Concert—relayed (daily) (k)
 - 5.30 Radio City Music Hall (f)
 - 6.00 Church of the Air (b)
 - 6.00 Dorothy Dreslin—Soprano (c)
 - 6.20 Varied Programme from Italian Stations (h)
 - 6.30 Dreams of Long Ago (c)
 - 6.30 News Report (f)
 - 6.40 Our Neighbours—Jerry Belcher interviewing families in their own homes (f)
 - 7.00 St. Louis Serenade (b)
 - 7.00 Magic Key Symphony Orchestra, directed by Frank Black (f)
 - 7.30 Living Dramas of the Bible (b)
 - 7.30 Thatcher Colt Mysteries (c)
 - 7.30 Call Letters (daily) (o)
 - 7.40 Dance Music or Gramophone Records (daily) (o)
 - 8.00 Romantic Melodies (c)
 - 8.00 Everybody's Music—Howard Barlow and Columbia Symphony Orchestra (b)
 - 8.00 News in German and French (daily) (o)
 - 8.25 Variety Programme (o)
 - 9.00 News in English (daily) (o)
 - 9.05 Military Band (o)
 - 10.00 "Our American Neighbours" (b)
 - 10.30 Guy Lombardo and his Orchestra (b)

Radio-Nations, 26.31 m.

From September 13 onwards an account of the day's proceedings in the League of Nations Assembly will be given at 8 p.m. BST.

- 10.30 A Tale of To-day (c and g)
 - 11.00 Catholic Hour (c and g)
 - 11.00 The Chicagoans (b)
 - 11.15 Concert from Radio Paris (l)
 - 11.30 Fireside Recitals (c and g)
 - 11.45 Morin sisters and Ranch boys (c and g)
- a.m.
- 12.00 Jello Summer Show (from Hollywood) (c and g)
 - 12.30 Baseball Results (c and g)
 - 12.30 Werner Janssen and His Orchestra (f)
 - 1.00 "1937 Edition of Twin Stars," Victor Moore & Helen Broderick (e)
 - 1.00 Variety Programme with Don Ameche (c and g)

MONDAY

- p.m.
- 12.30 Organ Reveille (daily except Sunday) (a)
 - 1.00 Mellow Moments (a)
 - 1.30 Jack Shannon—Songs (a)



Hollace Shaw sings both classical and light popular numbers every Monday and Friday in "Song Time"

- 1.45 Leon Goldman—Violinist (a)
- 2.00 Near and Far East—News in English and Italian, and Concert of Music (daily, except Sunday) (h)
- 2.00 Breakfast Club Orchestra (f)
- 2.00 Metropolitan Parade (a)
- 2.10 French Women's Chronicle—by Mrs. Decaris (j)
- 2.45 Bachelors' Children (daily, except Sunday) (a)
- 2.55 Press Radio News (daily, except Saturday and Sunday) (f)
- 3.00 Story of Mary Marlin (daily, except Sunday) (f)
- 3.00 Pretty Kitty Kelly (daily, except Saturday and Sunday) (a)
- 3.15 "Ma Perkins"—dramatic sketch (daily, except Saturday and Sunday) (f)
- 3.30 Pepper Young's Family (daily, except Sunday) (f)
- 4.00 "The O'Neill's"—dramatic sketch (daily, except Sunday and Wednesday) (f)
- 4.20 Italian East Africa—News in Italian; Orchestral and Vocal Concert (daily, except Sunday) (h)
- 4.15 Personal Column of the Air, featuring Inez Lopez (daily, except Saturday and Sunday) (f)
- 4.30 "Vic and Sade"—Comedy Sketch with Art Van Harvey, Billy Idelson and Bernardine Flynn (f)
- 4.45 Edward McHugh — the Gospel Singer (f)
- 5.00 Happy Jack—Songs (c)
- 5.00 Swinging the Blues (d)
- 5.15 Your News Parade (daily, except Saturday and Sunday) (d)
- 5.30 WGY Farm Programme (daily except Sunday) (c)
- 5.30 "Romance of Helen Trent"—Dramatic Sketch (daily, except Saturday and Sunday) (a)
- 5.30 Arabian Hour—News in Arabic; Concert of Arabic Music (daily, except Sunday) (h)
- 5.45 "Our Gal Sunday" — Dramatic Sketch (daily, except Sunday) (d)
- 6.00 Joe White—Tenor (c and g)
- 6.00 Travelogue of the United States in French (c)
- 6.00 Gold Medal Hour—"Betty and Bob"—Dramatic Sketch, and Hollywood in Person (daily, except Saturday and Sunday) (d)
- 6.15 Dan Harding's Wife (daily, except Saturday and Sunday) (c)
- 6.30 Words and Music (c)
- 6.40 News in German (daily, except Sunday) (h)

- 6.45 Aunt Jenny's Real Life Stories (daily, except Sunday) (d)
 6.55 News in French (daily, except Sunday) (h)
 7.00 News Through a Woman's Eyes (d)
 7.10 Varied Programme from Italian Stations (daily, except Sunday) (i)
 7.15 Jack and Loretta—Songs and Patter (daily, except Sunday) (a)
 7.30 Montana Slim—Yodelling Cowboy (d)
 8.00 Colonel Jack Major's Variety Show (b and d)
 8.00 Pepper Young's Family (daily, except Saturday and Sunday) (c)
 8.15 Ma Perkins (daily, except Saturday and Sunday) (c)
 8.30 Relay (k)
 8.30 "Pop" Concert, directed by Howard Barlow (b and d)
 9.00 Lorenzo Jones (daily, except Saturday and Sunday) (c)
 9.00 Bob Byron—"Swing" Whistler, Piano and Patter (b and d)
 9.05 Popular Concert of Light Music (daily, except Sunday) (o)
 9.15 The Dictators (b and d)
 9.30 Playdays (d)
 10.00 Clyde Barrie—Baritone (b and d)
 10.15 Travelogue of the United States in English (c and g)
 10.30 Doris Kerr—Songs (b and d)
 10.15 Eton Boys—Male Quartet (b and d)
 10.30 The Singing Lady—Nursery Jingles, Songs and Stories (f)
 10.45 Funny Things—Nora Stirling (b and d)
 11.00 News Reporter (daily, except Sunday) (f)
 11.00 American Hour—News in Italian and English; Opera; 2RO Mail Bag (h)
- 11.00 Howard Phillips—Baritone (d)
 11.05 U.S. Army Band—Capt. Thomas F. Darcy; Conductor (f)
 11.15 Four Stars, Girls Vocal Quartette (d)
 11.15 News in English (daily, except Sunday) (h)
 11.15 Gramophone Records (l)
 11.30 Press Radio News (daily, except Sunday) (c and g)
 11.30 Press Radio News (daily, except Sunday) (f)
 11.35 Three X Sisters (c and g)
 11.35 Sports Resume—Paul Douglas (daily, except Sunday) (d)
 11.45 Lowell Thomas—News (daily, except Sunday) (f)
 11.45 George Hall's Orchestra (d and i) a.m.
 12.00 Amos 'n' Andy (c and g)
 12.00 Poetic Melodies (daily, except Sunday) (d)
 12.15 Song Time—Hollace Shaw and Ray Heatherton (d)
 12.30 Voice of Fireside Concert (c and g)
 12.30 Hollywood Observer—with Del Casino, Milton Hirth, Guest and Ray Block's Orchestra (d)
 12.45 Boake Carter (d)
 2.00 Columbia's Shakespeare Cycle—Shakespearean Play, with Victor Bay's Symphony Orchestra (c)

TUESDAY

p.m.

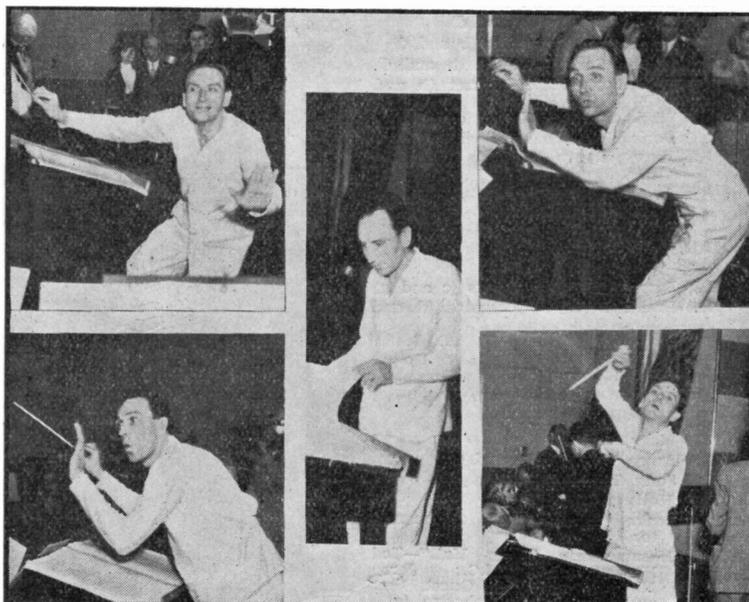
- 1.30 Montana Slim—Yodelling Cowboy (a)
 1.45 Maurice Brown—"Cellist" (a)
 2.00 "Dear Columbia"—Fan Mail Dramatization (a)
 2.10 Social Topics, by Mr. Rives (j)
 2.30 Richard Maxwell—Tenor Philosopher (a)

- 2.40 Press Radio News (a)
 5.00 The Rhythmaires (d)
 6.00 Cleo Brown—Songs (c)
 6.30 It's a Women's World (c)
 7.00 Molly Steinberg—Stage Relief Speaker (d)
 7.30 Dalton Brothers—Vocal Trio (d)
 8.00 Theatre Matinee (b and d)
 8.30 Columbia Concert (b and d)
 8.45 Have You Heard?—Dramatization of Interesting Facts (f)
 9.00 Bob Byron—"Swing" Whistler, Piano and Patter (b and d)
 9.30 Club Matinee—Variety Show (f)
 10.15 Science Service Series (b and d)
 10.15 Choir Symphonette (c and g)
 10.30 St. Louis Syncopators (b and d)
 11.00 News in English (h)
 11.15 Three X Sisters (c and g)
 11.20 Latin American Hour (i)
 11.35 Short Wave Mail Bag (c and g)
 12.00 Amos 'n' Andy (c and g)
 11.45 George Hall's Orchestra (i and d) a.m.
 12.15 Song Time with Ruth Carhart and Bill Perry (d)
 2.00 "Watch the Fun Go By," presenting Al Pearce and His Gang; Nick Lucas, Singing Guitarist; Arline Harris, "Human Chatter-box," with Carl Hoff's Orchestra (c)
 2.30 Benny Goodman's Swing School—Pat O'Malley and Guest (e)

WEDNESDAY

p.m.

- 1.00 Poetic Strings (a)
 1.30 Dalton Brothers—Vocal Trio (a)
 1.45 Sydney Raphael—Pianist (a)
 2.30 Richard Maxwell—Songs of Comfort and Cheer (a)
 3.00 "Story of Mary Marlin" (f)
 3.15 "Ma Perkins"—Dramatic Sketch (f)
 3.45 Viennese Ensemble (f)
 4.00 "The O'Neills"—Comedy Sketch (f)
 4.30 Vic and Sale (f)
 6.00 Three Rancheros (c)
 6.00 Make Believe—Ruth Carhart, contralto; Bill Perry, tenor; Novelty Orchestra (d)
 7.00 Fantasy in Rhythm (c)
 7.00 News Through a Woman's Eyes (d)
 7.30 Montana Slim—Yodelling Cowboy (b and d)
 8.00 Manhattan Matinee—Variety Programme (b and d)
 8.15 Continental Varieties with Celia Branz (Contralto) (f)
 8.30 Current Questions Before the House (b and d)
 8.45 Columbia Concert Hall (b and d)
 9.30 Russell Dorr—Baritone (b and d)
 9.45 Academy of Medicine (b and d)
 10.00 Ann Leaf at the Organ (b and d)
 10.15 "Four Stars"—Mixed Quartet (b and d)
 10.35 Cappy Barra's Swing Harmonicas (c and g)



Werner Jansenn shows what it takes to conduct an orchestra. His programme is to be heard during N.B.C. Sunday broadcasts.

- 10.45 Funny Things—Nora Stirling (b and d)
 10.55 Johnnie Johnston (c and g)
 11.00 North American Hour—News in English (h)
 11.00 Del Casino—Songs (d)
 11.05 Harry Kogen and His Orchestra (f)
 a.m.
 12.00 Amos 'n' Andy (c and g)
 11.15 Eton Boys—Male Quartet (d)
 11.45 The Singing Waiters (i and d)
 12.30 George Hall and His Orchestra (d)
 12.45 Boake Carter (d)
 1.30 "Laugh with Ken Murray"—Ken Murray (Comedian), "Oswald" Shirley Rosce (Vocalist), Marlyn Stuart, and Sud Gluskin's Orchestra (e)

THURSDAY

- p.m.
 1.30 Montana Slim—Yodelling Cowboy (a)
 1.45 Maurice Brown—Cellist (a)
 2.00 As You Like It—Variety Programme (a)
 2.30 Richard Maxwell—Tenor Philosopher (a)
 2.10 Life in Paris, by Mr. Henri Bellamy (j)
 2.40 Press Radio News (a)
 5.00 The Merry Makers (a)
 6.30 Words and Music (c)
 7.00 Ramble in Rhythm (d)
 7.30 Dalton Brothers—Vocal Trio (d)
 7.45 Piano Recital (f)
 8.00 N.B.C. Light Opera Company; Harold Sanford, Conductor (f)
 8.00 Theatre Matinee (b and d)
 8.30 "Do You Remember"—Old Favourites (b and d)
 9.00 Howells and Wright—Piano Team (b and d)
 9.15 Personal Column of the Air (c)
 9.30 U.S. Army Band (b and d)
 10.00 Current Questions Before the Senate (b and d)



Conductor Victor Bay, Columbia Symphony Orchestra

- 11.00 North American Hour—News in English (h)
 11.05 Harry Kogen and His Orchestra (f)
 11.15 Norsemen Quartet (c and g) (h)
 11.20 Latin American Hour—News in Italian, Spanish and Portuguese (i)
 11.35 Chuchu Martinez—Tenor (f)
 11.45 George Hall and His Orchestra (i and d)
 a.m.
 12.00 "Easy Aces"—Comedy Sketch, featuring Jane and Goodman Ace (f)
 12.00 Amos 'n' Andy (c and g)
 12.00 Poetic Melodies—Jack Fulton (Tenor), Franklyn MacCormack (Reader), and Carlton Kelsey's Orchestra (d)
 12.15 Song Time—with Doris Kerr and Russell Dorr (d)
 12.45 Patti Chapin—Songs (b)
 1.00 Rudy Vallee's Variety Hour (c and g)
 2.00 Major's Bowes' Amateur Hour (e)

FRIDAY

- p.m.
 1.00 The Novelteers (a)
 1.30 Song Stylists (a)
 2.00 Metropolitan Parade (a)
 2.10 Events of the Moment (j)
 2.40 Press Radio News (a)
 6.00 Alexander Brothers (c)
 6.30 Words and Music (c)
 7.00 News Through a Woman's Eyes (d)
 7.30 Montana Slim—Yodelling Cowboy (d)
 8.00 Columbia Concert Hall (b and d)
 8.30 Three Consoles (b and d)
 9.15 Among our Souvenirs (b and d)
 10.00 Marion Carley—Pianist (b and d)
 10.15 Eton Boys—Male Quartet (b and d)
 10.15 While the City Sleeps (c and g)
 10.30 Doris Kerr—Songs (b and d)
 11.05 Harry Kogen and His Orchestra (f)
 11.05 North American Hour—News in English and Italian; Concert of Request Numbers (h)
 11.15 Hobart Bosworth—Dean of Hollywood (d)
 11.15 Barry McKinley—Songs (c and g)
 11.45 Frank Dailey's Orchestra (d and i)
 a.m.
 12.00 "Poetic Memories"—Jack Fulton (Tenor), Franklyn MacCormack (Reader), and Carlton Kelsey's Orchestra (d)
 12.00 Mary Small—Songs (f)
 12.00 Amos 'n' Andy (c and g)
 12.15 Song Time (d)
 12.30 Hollywood News (d)
 12.45 Boake Carter—News Commentator (d)
 1.00 "Hammerstein Music Hall"—Ted Hammerstein M.C.; Jerry Mann, Comedian; Guest Star and Music Hall Orchestra (e)
 1.30 WGY Farm Forum (c and g)
 1.30 Hal Kemp's Dance Band, with Alice Faye and Don Forbes (e)

SATURDAY

- p.m.
 1.00 Poetic Strings (a)
 1.30 Four Stars—Girls' Vocal Quartet (a)
 1.45 Leon Goldman—Violinist (a)
 2.00 Breakfast Club (f)
 2.00 Ray Block at the Piano (a)
 2.10 Judicial Talk by Mr. Henri Delmont (j)
 2.15 Dalton Brothers—Male trio (a)
 2.30 Fiddlers' Fancy (a)
 2.45 Mellow Moment (a)
 2.55 Press Radio News (a)
 3.00 Ruth Cross—Your Garden and Mine (a)
 5.00 Continentals (c)
 5.15 Orientale (d)
 5.30 WGY Farm Programme (c)
 5.30 George Hall and His Orchestra (d)
 6.00 Your Host is Buffalo (c)
 6.15 Jimmy Shields—Tenor (d)
 7.00 Your Host is Buffalo (c)
 7.15 Ann Leaf at the Organ (d)
 7.45 Tours in Tone (d)
 8.00 "Down by Herman's" (b and d)
 8.00 Chick Webb and His Orchestra (f)
 8.30 Ricardo and His Caballeros (f)
 8.30 Department of Commerce Series (b and d)
 9.00 The Dictators (b and d)
 9.30 The Dancepaters (b and d)
 10.00 Frank Dailey's Orchestra (b and d)
 10.30 Kaltenmeyer's Kindergarten (c and g)
 11.00 North American Hour—News in English (k)
 11.00 Three Cheers (c and g)
 11.00 Ben Feld and His Orchestra (d)
 11.20 Latin American Hour (h)
 a.m.
 12.15 Song Time (d)
 1.00 Saturday Night Swing Club (e)
 1.30 Johnny Presents—Russ Morgan's Orchestra; Charles Martin's Circumstantial Evidence Thrills, "It Might Have Happened to You" (c)



Virginia Payne in an N.B.C. "Ma Perkins" episode

The SHORT WAVE MAGAZINE EXHIBITION SUPPLEMENT

Containing **DETAILS OF ALL SHORT WAVE RADIO EXHIBITS**

AUGUST 25TH - SEPTEMBER 4TH

September, 1937

Regd.
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'AVO' TESTING INSTRUMENTS

BRITISH
MADE

WORLD FAMOUS FOR ACCURACY



THE D.C. AVOMINOR

This accurate moving-coil instrument is 13 meters in one. It has 13 ranges—voltage ranges sufficient for measuring H.T., L.T., Grid Bias, Mains and Eliminator Voltages; milliamp ranges for testing all receiving valves and radio apparatus; resistance ranges for all resistance measuring. In case, complete with testing prods, crocodile clips, leads and instruction booklet. **45/-**

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A complete guide to radio testing. This book is a new and greatly enlarged edition of a valuable manual that has sold in thousands. It explains how to take all radio measurements, how to trace and rectify all radio faults, how to get best results from all apparatus. Numerous diagrams and illustrations.

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Universal AVOMINOR

A compact precision moving-coil instrument for all A.C. and D.C. testing. It has 22 ranges covering A.C. volts, D.C. volts, current, and resistance. All readings direct. Total resistance of meter, 200,000 ohms. Complete with testing prods, crocodile clips and instruction booklet. **£5 10s.**

Leather Case, 10/-



"AVO" TESTING ACCESSORIES

This kit makes for accurate and speedy testing. Contains insulated testing prods, crocodile clips, connecting leads, etc. Easier, safer and quicker to use than nondescript lengths of wire. **2/6**

See 'AVO' Instruments
at
RADIOLYMPIA

Stands Nos.

30 MAIN
HALL

and **166** Gallery

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illustrated literature.

The AVODAPTER

Simplifies
valve
testing.
Enables all
valves to be
tested under
actual working
conditions
without
cutting connections
or grovelling about
inside the set. In-
stantly adaptable for
4-pin, 5-pin
and 7-pin
valves. **27/-**



9-Pin AvoCoupler

(Not illustrated) Instantly renders AvoDapter suitable for 9-pin valves. **12/6**

THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.
Winder House, Douglas Street, London, S.W.1.

Telephone: Victoria 3404-7



This New SHORT-WAVE CONVERTER offers to You Reception from ALL OVER THE WORLD including Television Sound Transmissions

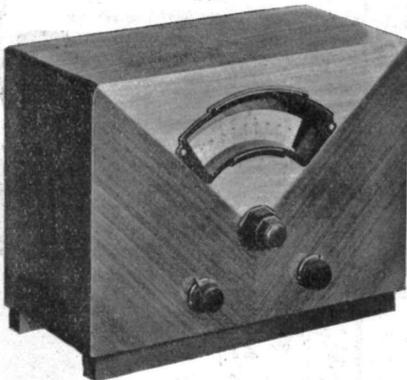
ONE OF MANY UNSOLICITED TESTIMONIALS:

"Since purchasing one of your 'Regentone' Converters, I have experienced really excellent results on all wave-bands from 8 to 80 metres, and have been really amazed at its performance on the ultra short waves."

"For the listener who is searching for something that will bring in everything of interest, I have no hesitation in recommending your product, and bless the day I was first introduced to it."

Yours sincerely,

BSWL 25.



REGENTONE PRODUCTS, LTD.
REGENTONE WORKS, WORTON ROAD,
ISLEWORTH, MIDDLESEX.

Connect it to your broadcast Receiver—only Two Minutes to install—and your set becomes an extremely efficient "ALL-WAVE" Receiver, ready to tune in all programmes, including SHORT-WAVE and TELEVISION SOUND TRANSMISSIONS.

It will operate with any type of Set, Mains or Battery, Superhet or Straight, but naturally, the more sensitive the set the better will be results on the Short Waves.

The detector-oscillator valve is an OCTODE of the latest type, and the circuit incorporates the highly-efficient "Electron mixing" principle. DO NOT CONFUSE this Converter with the cheap 'adaptor' which merely plugs into one of the valveholders in your set. The Converter is a *completely self-maintained Mains Instrument* which actually 'converts' your broadcast set (regardless of type) into a *highly-efficient SHORT-WAVE SUPERHET*, covering two wavebands by switch—from 6.5 to 26 metres and from 25 to 80 metres.

SUPPLIED COMPLETE WITH ALL VALVES, AND CONTAINED IN AN ATTRACTIVE TWO-TONE WALNUT CABINET READY TO CONNECT TO YOUR SET

£4.19.6

(For A.C., AC/DC model 5/6 extra); Hire Purchase; initial payment of 10/- and 8 monthly payments of 13/6 (AC/DC 14/8)

RADIOLYMPIA REVIEW

In the following pages we present a report of those exhibits at Radiolympia that are of interest to our readers. Our endeavour has been not to report the Exhibition as generally done, but rather to cover all things appertaining to short-wave transmission and reception.

ACE RADIO.

Stand No. 103.

Among the various models shown the new AW94 is of outstanding importance. Here is a 9-valve set that gives a remarkable performance. An all-wave model that has two short-wave bands ranging from 11-35 and 30-85 metres. The output stage consists of two double triodes in push-pull giving 12 watts. This set costs 15 guineas, and is one of many all-wave models that present many interesting features.

AERIALITE, LTD.

Stand No. 28.

Although specialising in aerial and earth equipment h.t. batteries, a short-wave adaptor, loudspeakers and microphones form a part of the display to be seen. New aerials are a "No Mast" at 3s. 9d. and a "Coilite" dipole (12s. 6d.).

Especially designed to cut out interference on the short waves, the "World-Wide All-Wave" dipole aerial deserves attention. Its effective range is 15 to 2,000 metres; a matching transformer is included in the kit. The aerial is 50 feet long with a same length lead and all wire is braided and weather-proof.

AERODYNE RADIO, LTD.

Stand No. 52.

The new Aerodyne range includes various all-wave models, and each receiver is modelled for either a.c. or d.c. supplies. One model in particular which has many points of interest is No. 291. This is a 5-valve superhet, having four wave-bands ranging from 13.5 to 2,000 metres. Here is a receiver that has high sensitivity, excellent output and low noise-level.

ARMSTRONG MANUFACTURING CO.

Stand No. 220.

One of the chief items of interest is the 6-valve all-wave superhet, which sells at £7 10s. complete.

THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.

Stands Nos. 30 and 166.

With the Avominor you can test with efficiency and precision. It is the counterpart of the famous Avometer; a self-contained 2½-inch moving coil combination testing instrument for d.c. current, voltage and resistance. It provides ranges of readings sufficient for the most complete radio testing and for the most extensive electrical measuring. No external shunts or multipliers are required on this thirteen-range instrument, and the likelihood of incorrect readings due to faulty shunt contact is eliminated.

The success of the D.C. Avometer has paved the way for the introduction of a further meter on somewhat similar lines, for the measurement of a.c. as

well as d.c. This new meter is known as the "Universal Avominor."

The Avometer is a multi-range continuous current-measuring instrument which gives readings of current, voltage and resistance over extremely wide ranges without the use of external shunts or multipliers. The set consists of a moulded panel, on the

The Universal Avometer is a multi-range d.c. and a.c. measuring instrument giving readings of current, voltage and resistance over its 36 ranges, each of 5 in. length, the accuracy of calibration being within limits prescribed by B.S.S. 89-1929 for 1st grade instruments.

The Avo-Oscillator is a small, compact, modulator oscillator suitable for radio service work of all kinds. It provides a steady local signal, modulated or non-modulated at will, whose fundamental frequency can be varied over the whole of the medium, long and intermediate wavebands.

The "Avo" Valve Tester reveals the state and efficiency of a valve by means of mutual conductance, thus giving a definite indication of how the



valve will work in a set. This is a great advance over the usual emission test, which does not give a reliable indication of valve "goodness."

The Capacity Meter displayed gives direct reading on a scale approximately 42 in. long; ranges from zero to .1 mfd. The sub-divisions on the scale between 0 and .0005 occur at intervals of 5 mmfds.

The "Avodapter" consists of a valve-holder, the connections to the sockets of which may be interrupted by a rotary switch, thus allowing a current meter to be inserted in certain feeds without alteration to the exterior wiring. The plug is instantly convertible for either 4- or 5-pin valves.

The "Avocoupler" is a combination of 7-pin plug and 5-pin socket, and its use enables the Avodapter to be quickly set up for 5- or 7-pin valves.

By means of a new 9-pin attachment the Avodapter can be rendered instantly suitable for making tests on the recently introduced valves fitted with 9-pin bases.

A. J. BALCOMBE, LTD.

Stand No. 55.

The new Alba range of course includes various all-wave models. Ranging in price from 8½ to 1½ guineas, there is a comprehensive variety from which to choose.

BEETHOVEN RADIO, LTD.

Stand No. 34.

All-wave transportable sets are here in variety, and Model No. AD303 is one of the leaders of its class. An 8-stage superhet for a.c. or d.c. mains, with a 2½-watt output, and priced at £10 17s. 6d, is surely moderately priced. Wave ranges are from 16 to 50 metres and up to 2,000. There is also on show a battery model with slightly different characteristics. A comprehensive exhibit for the all-wave listener.

BELLING & LEE, LTD.

Stand No. 42.

Listeners situated in localities where interference from electrical apparatus causes bad reception will be repaid by a visit to Stand 42. Here seems to be solutions to any and every form of noise trouble.

The "Eliminnoise" anti-interference aerial is substantially the same as last year's model, though it has been strengthened and made slightly more efficient. It is effective on all broadcast bands, 10-56, 200-600 and 1,000-2,000 metres. Suppression on all these wavebands without serious loss of signal strength is claimed; can be erected as easily as an ordinary "L" type aerial and is similar in appearance. 8 to 10 receivers can be fed from one aerial and may be tuned to the same or different stations without inter-action.

Interference measuring apparatus, noise locators, television aerials and transmission lines, loudspeaker plugs and sockets, and the "Mag-Nickel" delay fuse are new developments whilst there are also the familiar Belling terminals, plugs, etc.

BENJAMIN ELECTRIC, LTD.

Stand No. 17.

Loudspeakers, valveholders, transformers and switches, etc., comprise this exhibit of the well-known Benjamin range. New types of valveholders of an improved shape are also shown, including a platform octal holder.

BRITANNIA BATTERIES, LTD.

Stand No. 83.

Pertrix "Bulldog" Standard range of batteries will, in future, be supplied in new cartons of a very distinctive and attractive design. Examples of new replacement batteries in the Pertrix Power, Double Power and Special Power Capacities are being exhibited. These include examples of new miniature h.t. batteries of 70, 90, and 108 volts for portable receivers. Typical examples of the extensive accumulator range are also being exhibited.

BRITISH BELMONT RADIO, LTD.

Stand No. 79.

The demand for Belmont sets has been such that they are now being manufactured in this country, and these British-made receivers are on exhibit. Delightfully finished models with varying prices that should suit the purses of all our readers.

THE BRITISH G.W.Z. BATTERY CO., LTD.

Stand No. 82.

The programme of the British G.W.Z. Battery Co., Ltd., for the 1937/1938 season is featured by the addition of several new lines which make the G.W.Z. range interesting in the battery world.

In addition to all types of standard high tension batteries, G.W.Z. list a full range of replacement batteries covering practically every popular set on the market and a special group of heavy duty high tension units suitable for export.

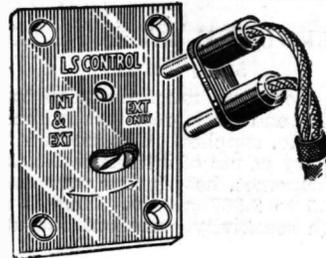
Included in the exhibit are standard h.t. and grid bias batteries for wireless; replacement batteries for all portable and transportable sets; refill batteries for pocket lamps, torches, cycle lamps, dry and Leclanche cells, sack elements.

BRITISH MECHANICAL PRODUCTIONS, LTD.

Stand No. 94.

At a time when price increases are ruling it is pleasing to note reductions. The well-known "Clix" lines are all on view; the pre-show prices maintain with the exception of Fuse Plug No. 27 and Plug Adaptor No. 29a, now respectively 1s. 3d. and 9d. each.

Long-reach plugs with resilient pins, with 1- or 2-inch insulators; master plugs with special insulator; master plug socket, a useful dual-purpose plug; and a crocodile clip for service work are new. In every "Clix" component part there is evidence



of the care and thought that obviates irritation for the user. Among these well thought out productions are: terminals of every shape, wander plugs, connectors, valve pins, chassis mounting strips, etc., etc. Our illustration shows the control panel. This loudspeaker "plug switch" control will add to the life of output valves; it also supplies a perfect method of controlling either a set speaker, extension, or both: It is fitted with a quick make and break switch operated by a side movement of plug.

BRITISH PIX CO., LTD.

Stand No. 211.

Among the various specialities exhibited by the Pix Co. is the "Magnatone" tubular aerial, which is a 16-strand copper strip, and is made specially for long-distance reception. Lightning arresters, metallised earths, etc., help make an exhibit that should be of interest to all our readers.

BRITISH ROLA CO., LTD.

Stand No. 41.

Many new features are embodied in the two new Rola models that are on view. The models F742

P.M. and F.1050 P.M. have exceptional sensitivity, and are particularly suitable for battery sets or for use as extension speaker, etc.

BRITISH TELEVISION SUPPLIES, LTD.

Stand No. 47.

The chief item of interest to short-wave listeners on this stand is the multi-valve superhet chassis for all-wave reception. These receivers have been designed to give trouble-free reception from all parts of the world and will be available in 8, 9 and 12 valve form. Each chassis has one stage of r.f. amplification, signal frequency followed by triode-hexode frequency changer, and then one or two stages of i.f. amplification followed by a second detector. A.V.C. is, of course, included; and, in the case of the 12-valve receiver, variable q.a.v.c., with improved a.v.c. on all valves preceding the second detector, will be incorporated. The latter chassis also includes an electron-ray tuning indicator. Each type of chassis is fitted with a resistance-coupled push-pull amplifier giving an undistorted output of 7 watts and also a tone control. The 12-valve chassis also makes provision for variable selectivity. There are also on show a wide range of B.T.S. components and two amplifiers.

BRITISH TUNGSRAM RADIO WORKS, LTD.

Stand No. 36.

Doubtless every short-wave enthusiast and certainly every experimenter will pay a visit to this stand. The many and varied types of valves on view include a number of new models which should be of the utmost interest to our readers.

A. F. BULGIN, LTD.

Stand No. 1.

To detail the various components on this stand would entail the production of a catalogue, particularly as Bulgin's are constantly making additions to the large number of components they manufacture. The stand should be the "Mecca" of the enthusiastic amateur.

BUSH RADIO, LTD.

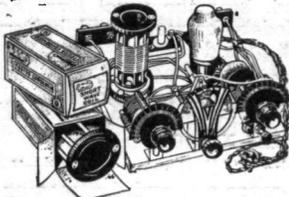
Stand No. 70.

An all-wave superhet for 10 guineas, and of Bush quality. This new set is on exhibition among a number of all-wave sets of pleasing appearance—but of particular interest is the model 3W45. Here

AMAZING BARGAINS!

"3-in-1" SHORT-WAVE KIT

Adaptor—Converter—Receiver
List Value 37/6



BARGAIN 25/-

Adapts or converts your battery set for short-wave reception, or may be used as 1-valve Short Wave Receiver. 12-94 metres.

KIT "1" comprises every part, including

3-4 pin coils, wiring and assembly instructions, less valve only. Cash or C.O.D. Carr. Pd. 25/-, or 2/6 down and 10 monthly payments 2/6. KIT "2"—With 2-volt valve, £1/8/6, or 2/6 down and 11 monthly payments 2/6.

2/6 DOWN

7 watt A.C. AMPLIFIER



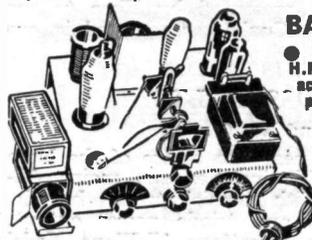
High-fidelity reproduction. Undistorted output 7-watts. For microphone or pick-up. Recommended for commenting, public meetings, home broadcasting. Circuit: triode, resistance transformer coupled to power amplifier valves in push-pull, valve rectifier. Consumption 60 watts. Steel chassis. Size: 7 1/2 in. high; 4 in. wide; 10 in. long. For A.C. Mains, 200 / 250 volts, 40/80 cys. Complete with 4 valves, ready for immediate use. Cash or C.O.D. **£3 : 10**

Or 6/- down and 11 monthly payments of 6/6

Complete 7 watt A.C. Public Address System comprising above Amplifier, highly sensitive Transverse Current Carbon Type Microphone, with separate transformer and G.B. battery and 25 ft. braided flex, 10 in Energised Speaker of required handling capacity and 50 ft. 4-way speaker lead. Cash or C.O.D. **£6 : 19 : 6.**
Or 12/9 down and 11 monthly payments of 12/9

D.X. FANS' A.C.4 SHORT WAVE KIT

List Value £5 10 0



BARGAIN 75/-

- Variable Mu H.F. pentode, leaky grid reacting detector, pentode output and valve rectification.
- Bandspread tuning with air-spaced condensers.
- Slow motion bandspread dial. • 3 calibrated scales 0-180, 0-180, 0-10. • For A.C. Mains 200-250 volts. 40-100 cycles.

KIT "1" comprises every part for assembly including 3 pairs 4 and 6-pin coils (12-94 metres), wiring and assembly instructions, less valves only. Cash or C.O.D. 75/- or 5/- down and 11 monthly payments of 7/-.

KIT "2" with 4 British Valves. Cash or C.O.D. £5/12/6 or 10/- down and 11 monthly payments 10/6. If specially matched energised Speaker required, add 10/6 to Cash Price or 2/- to deposit, and 1/6 to each monthly payment.

5/- DOWN

COMPONENTS and ACCESSORIES

P.M. SPEAKERS. Goodmans, Limited stock. For Power, Pent. or Class "B" (state which), 7/6. 8 1/2 in. for power pentode, with terminals for low impedance matching for extension purposes, 13/6. Similar speaker for Class "B" and low impedance matching, 13/6. All types by well known manufacturers, satisfaction guaranteed.

HEADPHONES. New light-weight, super quality, ideal for short-wave work and testing, 3/6.

VALVEHOLDERS. Chassis type paxolin, 4- and 5-pin, 2 1/2. 7-pin, 3 1/4. Octal, 6d. Baseboard 4- and 5-pin type with terminals, 3 1/2.

RESISTORS. Eric. All values, 1 and 1/2-watt, 4d. 3/6 doz. 1-watt, 5d. 4/6 doz. 2-watt, 8d. 6/6 doz. 3-watt, 9d. 6/- doz.

FREE! (1) Short Wave Constructor's Book. (2) N.T.S. General Bargain Catalogue. (3) N.T.S. Short Wave Bargain Catalogue. 2 1/2. (stamps) to cover postage brings you all 3. Send for these to-day.

NEW TIMES SALES CO., 56 (S.M.2.) LUDGATE HILL, LONDON, E.C.4.

ESTABLISHED 1924

is an admittedly de luxe model with outstanding output performance. This model is fitted with a tuning device that will enable the beginner in short-wave listening to obtain the best results.

CELESTION, LTD.

Stand No. 26.

The various models of the well-known Celestion loud speakers cover a large range and with prices varying from £2 upwards these speakers should be of interest to every type of listener.

E. K. COLE, LTD.

Stand No. 69.

An innovation is being made by Ekco who have frequently pioneered radio developments. The new models, instead of having knobs protruding from the face of the cabinet, have controls visible only as milled rims. The main tuning control is a fly-wheel running on ball-bearings and spins the indicator across the scale with the slightest touch. A "clutch" is fitted which automatically disengages the control at the ends of the scale. The models employing this system can be switched on, tuned to a station, volume set to the desired level and tone adjusted, all by the use of one finger! Moreover, the operations can be carried out with record speed.

Another innovation is a "no h.t." set for all-wave operation, and Model BV78 is the first all-wave set of this type to be produced. A similar receiver for battery operation, Model BAW78, is also made.

In addition there are a number of other all-wave models of the usual Ekco quality and finish.

When visiting this stand make a point of inspecting the windmill presented by Ekco to the islanders of Tristan da Cunha, as reported in our July issue.

A. C. COSSOR, LTD.

Stand No. 61.

On this large stand near the centre of the Main Hall the Cossor exhibit includes a.c. mains All-Wave Model 348. With special triode hexode, h.f. pentode detector, and triode power output, full-wave rectifier, also a battery All-Wave Model 338, with special pentagrid, h.f. pentode detector, and economy high slope output, price (without batteries) £6 15s. There are also numerous other all-wave models that command attention.

THE DUBILIER CONDENSER CO. (1925), LTD.

Stand No. 81.

In addition to those types with which users are already familiar the following new and improved Dubilier condenser designs will be of special interest. A new range of non-inductive tubular paper dielectric; oil-immersed paper dielectrics; Dubilier double barrier condensers in metal cases which will operate satisfactorily at high ambient temperatures and in humid conditions; a large range of moulded mica condensers; high stability mica condensers clamped and sealed in bakelite cases; high voltage mica condensers; metallised mica condensers of extreme stability and accuracy of capacity value in a variety of new designs including ceramic cased types; ceramic dielectric condensers of low loss, low tempera-

ture co-efficient, high stability and accuracy in various sizes and in disc, cup, and tube forms, and wet and dry electrolytics.

Also to be seen are metallised insulated resistances in $\frac{1}{2}$, $\frac{1}{4}$ and 1 watt ratings; insulated low range, low power, wire wound resistances; ultra high range resistances; radio anti-interference devices, motor radio suppressors and anti-interference units for trolleybus and tram systems; railway signalling condensers; transmitting and high tension smoothing condensers specially designed and supplied to Government Departments; apparatus demonstrating the current saving effected by the use of power factor correction condensers, voltage regulation and interference suppression.

DYNATRON RADIO, LTD.

Stand No. 104.

The new Dynatron range of high fidelity all-wave radio gramophones and receivers exhibited represent concentration on the production of radio reproducers of the highest possible quality. It is anticipated that their new features will be revolutionary.

For many years Dynatron have concentrated on the design of highly efficient straight receivers until further progress has been restricted, it is claimed, by lack of suitable components and materials. The new models combine the admitted high fidelity advantages of the straight receiver with the more readily obtainable higher selectivity of the superhet. This changeover of the two types of receivers is automatically controlled by the variable selectivity control.

EVER READY CO., LTD.

Stand No. 58.

The all-wave models, of which there are a large variety on this stand, bear the usual Ever Ready mark of quality. Models for mains and battery at moderate prices that should interest every type of listener.

EVERETT, EDGCUMBE & CO., LTD.

Stand No. 164.

In addition to the "All Purpose Tester" the double pointer multi-range a.c. and d.c. moving coil meter and the "Service Valve Tester" which was introduced last season, two new lines will be seen on this stand. These are the "Valve Gauge," a simple emission and mutual conductance tester handling all types of valves, and an "All Wave Oscillator" with a continuous wave-range of 10 to 3,000 metres. The "Visual Valve Tester" has been modified to include a more elaborate power pack and voltage stabilization. In addition a wider range of dwarf instruments will be shown, and also power output meters and other radio testing equipment.

FERRANTI, LTD.

Stands Nos. 21 and 74.

Ferranti once again come forward with new developments. Included in this exhibit are seven different all-wave models ranging in price from nine to twenty-three guineas.

As an example of Ferranti efficiency the 1137B, all-wave 7-stage superhet is outstanding value at eleven guineas. There is also a complete range of Ferranti radio instruments including models for a.c. and d.c.

COMPONENTS FOR THE "S.W. STRAIGHT RECEIVER"



EPOCH NEW CENTURY SPEAKER complete with special output transformer manufactured specially for the Short-Wave Magazine Straight Receiver. This Speaker has an 8" diaphragm, and has a heavy "alnico" magnet which does not require re-magnetising. Is extremely sensitive and ideal for short-wave reception.

PRICE . . . **35/-**

CONDENSERS

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- 2 .0001 Tubulars
- 1 .002 "
- 8 .01 "
- 1 2mfd in can

The complete kit of 12 condensers ready for immediate use.

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100 Kcs. Quartz Bars within plus or minus 25 cycle.

Q.C.C. H.F. CHOKES

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"IDEAL" RECEIVER.

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Type B. Three required ... 1/3 each.

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FULLER ACCUMULATOR CO. (1926), LTD.

Stand No. 100.

For the coming season the Fuller Accumulator Co. have greatly increased their range of both accumulators and dry batteries, particularly in the case of the latter which is now very comprehensive and provides a suitable h.t. battery for every popular radio receiver. Certain additions have also been made to both jelly and free acid unspillable accumulators for portable and transportable sets.

An exhibit which will prove of interest to short-wave enthusiasts, particularly those operating in remote parts of the country, is the Fuller range of inert high and low tension batteries.

THE GENERAL ELECTRIC CO., LTD.

Stand No. 62.

As in previous years G.E.C. are prominently represented. A complete range of the new receivers scheduled for marketing this season are displayed, and the range is the most comprehensive the Company has yet brought out, with mains and battery sets of the highest standard which should appeal to every class of listener.

One of the chief items of interest is the "A.C. All-Wave 5" 3-waveband superhet of remarkable performance and modern design, at a price that should ensure it the widest popularity.

There is also shown the "A.C. All-Wave Super 6," a striking 3-waveband superhet, with every facility of control. Next, the "A.C. All-Wave Quality 8"—a 3-waveband instrument with a 6-watt push-pull triode output stage giving exceptional undistorted quality. Other receivers of unlimited range are the "A.C. All-Wave 6" and the "Fidelity All-Wave 8"—both of them 4-waveband superhets for full all-wave reception. Battery models are also on exhibition.

GOODMANS INDUSTRIES, LTD.

Stand No. 43.

In an effort to reduce the focussing of the higher frequencies, the Goodman elliptical reproducer has been introduced, and an additional advantage of this speaker is that, due to its shape, it can be accommodated in a comparatively small cabinet, thereby giving reproduction equal to that of a 10 in. unit, but in a space normally occupied by a 6 in. midget type loudspeaker. Elliptical cone loudspeakers have in the past proved unsatisfactory due to bad "break up" of the diaphragm, but with the advent of the exponentially shaped elliptical cone, however, this trouble has been almost entirely eliminated.

The acoustical efficiency of this unit is high, due to the elliptical cone combining the advantages of steep and shallow angle cones, thus maintaining a more uniform load at all frequencies. A multi ratio transformer is fitted as standard, but any impedance can be supplied if specified when ordering. The loudspeaker can also be supplied less transformer.

GORDON ELF, LTD.

Stand No. 95.

Here the chief item of interest to our readers is the all-wave universal receiver, which has a self-

contained aerial, and has wave range of from 10 to 2,000 metres.

HALCYON RADIO, LTD.

Stand No. 35.

Among the many all-wave sets on this stand a very low priced model, No. U.575 at 8 guineas is remarkable value. An all-wave superheterodyne receiver with good all-round performance on all wavebands, and high quality reproduction. This model is housed in an attractive cabinet of unusual design, and is provided with a clear scale and a tuning drive operated by a single knob control, giving a ratio of 12 to 1. A special long life power lamp is provided as a pilot and for illuminating the scale, quality of reproduction is of the highest standard. Battery and mains sets of varying price make a comprehensive exhibit.

HARRIES THERMIONICS, LTD.

Stand No. 3.

This exhibit comprises valves and receivers, including the newly released Hivac Harries all-stage valve. This is the first universal standard valve for modern superheterodyne and straight receivers. A high performance six-valve and rectifier chassis using Hivac Harries all-stage valves, as marketed under license from the Company. A four-valve and rectifier superheterodyne receiver, also using Hivac Harries all stage valves, with an analysis of its patent position. This receiver is made in accordance with Harries patents.

There is an exhibit setting out the patent history of receivers and valves, referring particularly to the Harries valves and receivers. This shows the Harries "Genealogical tree" system of patent and record filing.

A demonstration of the power handling capabilities of the new Hivac Harries AC/Q critical distance 60-watt tetrodes proved of interest.

F. C. HEAYBERD & CO., LTD.

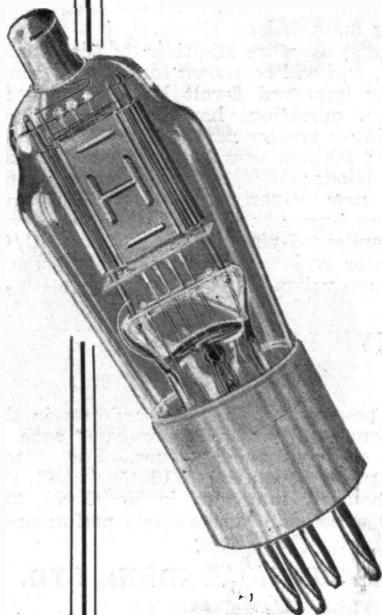
Stand No. 25.

Transformers, chokes, mains units, battery chargers and rectifying equipment are the main range of products shown by this firm.

The transformers cover all types, suitable for both metal and valve rectifiers, as well as filament and low tension models for various radio purposes. Mains units include models suitable for both a.c. and d.c. supplies. The a.c. unit, model 15/50, has an output of 150 volts at 15-50 ma., and is designed to give practically constant voltage regulation at 150 volts throughout the scale of current from 15-50 ma. The unit for d.c. mains, model H.D.C. 150 has triple, adjustable tapings at 15, 25 and 50 ma. at 150 volts. The battery charging equipment includes the Tom Thumb Charger, suitable for charging a 2-volt accumulator at 0.5 amp, and incorporates all metal parts. This charger sells at the remarkably low price of 12s. 6d., but it embodies all the essential components as used in large chargers.

A new charger which has been introduced is the A.0.9, with an output of 2, 6 and 12 volts at 3 amps. This model incorporates metal rectifier and has a variable current regulator and ammeter. The price is 105s.

SHORT-WAVE VALVES



We are consistent advertisers in your magazine because we know that the Hivac range of valves will exactly suit your special requirements. You have evidence of this in the fact that

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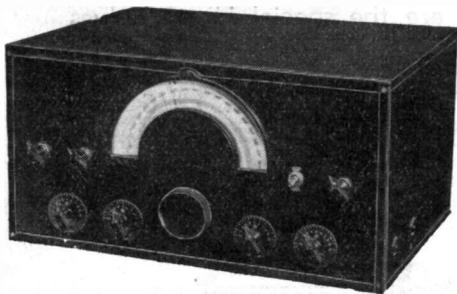
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ELECTRONIC HOUSE, 22, Howland Street, Tottenham Court Road, W.1.
Museum 5675.

W. T. HENLEYS TELEGRAPH CO., LTD.

Stand No. 20.

An exhibit of particular interest to our readers on this stand is the Single Signal Superheterodyne receiver which was designed by G5ZZ and G6WY as an effort to produce a receiver for effective use by amateurs on their notoriously crowded bands. Each set is tested on 120 ft. and 6 ft. aerials, and individual construction methods are applied in the manufacture. Coil-changing is effected in a simple manner by the insertion of a sub-divided metal box containing three sets of windings, the ranges being



in five steps from 10 to 160 metres. Three models are available, priced from £20 to £22. The power supply is not incorporated in the receiver, separate packs are available for purchasers who have not a supply to hand.

Erivzone Radio and Television Co., Ltd. are responsible for the production of this receiver.

THE HIGH VACUUM VALVE CO., LTD.

Stand No. 27.

Each year Hivac have been able to show on their stand at Radiolympia some original and exclusive valve development. Two years ago the Hivac Harries Critical Distance Output Tetrode was shown and demonstrated. This was the first Critical Distance Output Tetrode to be marketed by any firm in the world. The principle was quickly adopted in America, and is to-day enjoying increasing popularity in England.

A range of 2-volt Midget Multi-Electrode valves, which revolutionised portable radio are another of Hivac contributions to the art of valve manufacture.

For the first time in its production form the Hivac Harries All-Stage valve will be seen. This valve is the result of four years' intense work by Mr. Stephen P. de Laszlo in co-operation with Mr. J. H. Owen Harries, the inventor. It is a multi-grid critical distance valve which is so constructed that it makes possible the production of a multi-valve receiver, such as a super-heterodyne, using only one type of valve throughout.

It is applicable to many specialised purposes, and may be used either in the transformer-fed a.c. receivers or in series heater type a.c./d.c. instruments and is put forward as the first fundamental advance in valve engineering (apart from the Critical Distance principle itself) which has been made for some years. Already one of the oldest firms in the industry have incorporated this valve in their latest receiver, and a complete chassis is on view.

Other exhibits will be a range of special 2-volt short-wave receiving valves, and a complete range of battery and mains valves. There will also be models of the "Wayfarer" Major portable receiver and the "Wayfarer" Grand. These instruments are now being marketed by Hivac.

The following valves are additions to the already existing range, and will be shown for the first time: QP240, a new improved 2-volt battery valve for economy q.p.p. operation, having smaller dimensions and giving a greater power output, 1.5 watts approximately; PX5, a new 6-watt 4-volt directly-heated output triode; AC/Q and AC/Qa (equivalent to 6L6). A new super power output tetrode marketed in two types: the former fitted with 4-volt heater and standard 7-pin base, whilst the AC/Qa has a 6.3 heater and octal base; A15, the Hivac Harries All-Stage valve.

INVICTA RADIO, LTD.

Stand No. 56.

Among the many beautifully finished sets in this exhibit are four different all-wave sets, each of which has its own particular virtues. For battery or mains the prices range from £10 15s. to £7 17s. We were particularly interested in Model No. 330, an a.c. mains superhet of remarkable performance.

JACKSON BROS. (LONDON), LTD.

Stand No. 93.

Here is an exhibit consisting of a complete range of variable condensers and drives, incorporating all types of single and ganged condensers, not the least interesting of which is a special ganged model of very small dimensions to meet modern requirements.

KOLSTER-BRANDES, LTD.

Stand No. 65.

Undoubtedly the crowning achievement of this season's range of K.B. receivers is the K.B.66. Possessing many advanced features and refinements, it satisfactorily fulfils the requirements of the critical listener who is prepared to pay a little extra for the very best that modern all-world radio can offer.

The unusually large output of the K.B.66 superhet—8 watts—besides providing an ample margin of power for ordinary domestic reception, makes the receiver particularly suitable for special purposes where great volume is required. It has four wavebands: 12.5-38, 29-94, 195-565, 970-2,300 metres and triode-hexode (frequency changer), 2 h.f. pentodes (first and second l.f. valves), double-diode-triode (second detector, delayed a.v.c., l.f. amplifier), super power output pentode, a.c. rectifier valves. Many other all-wave sets are shown.

As long ago as 1933, K.B. introduced the original "Rejectostat" anti-disturbance aerial system for medium and long wave lengths only, which met with instant success. The principle has been extended to embrace short-wave reception and the new K.B. "Rejectostat" all-wave aerial equipment is effective on short, medium and long wavelengths. The total range covered is 12-2,000 metres without switching.

LISSEN, LTD.

Stand No. 73

This exhibit comprises a complete range of receivers, batteries and components. The latter, of course, will be of importance to our readers. All-wave receivers hold a prominent position, and with prices varying from £8 17s. 6d. to £17 17s., practically every type of all-wave listener is catered for.

MARCONIPHONE.

Stands Nos. 53 and 64.

All-wave sets in the luxury class down to an ordinary three-valve set selling at 7½ guineas—such is the exhibit of the Marconi Company. A new ten-valve de luxe superhet for a.c. mains, covering a range of from 4.58 to 2,000 metres in five wavebands, and incorporating every worth-while circuit refinement. Then there is the beautiful Model 563, another ten-valve all-wave superhet auto-radio-gramophone. The whole of this exhibit worthily maintains the traditional Marconi standard.

McMICHAEL RADIO, LTD.

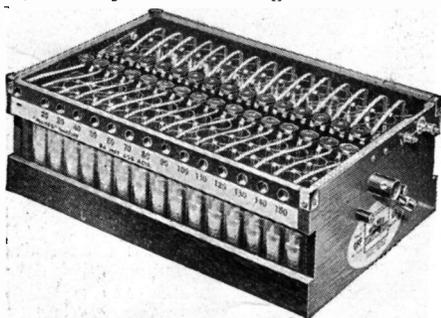
Stand No. 59.

The new McMichael range includes an all-wave mains superhet No. 371, designed to place a McMichael all-wave within reach of every listener. The chassis is a seven-stage band-pass all-wave with 6 tuned circuits and 2.3 watts output to large energised moving coil speaker, separate models being available for a.c. and a.c./d.c. mains. Wave-range, 16.5 to 50, 200-500 and 850-2,000 metres. Other all-wave models include a transportable and a luxury model radiogram.

MILNES RADIO CO., LTD.

Stand No. 88.

Your attention is directed to the "Onyx" (battery) and "Venus" (a.c. mains) models. These possess a very ingenious band-spreading device on the short-waves, whereby a range from 12.5 to 51 metres is split up into six full-scale wavebands. This, in conjunction with the reverse-vernier tuning control, actually makes tuning of short waves 12



times simpler than usual, and results in both the tuning of a greater number of stations and the easier selection of wanted stations.

There is also on view the well-known Milnes h.t. supply units, charging batteries, switches, etc.

MULLARD RADIO VALVE CO., LTD.

Stands Nos. 72 and 161.

Mullards have introduced a new expression descriptive of an ingenious feature of their 1937 programme; this is "Magiccontrol," and Mullards have coined it to describe the new device which they have introduced this year. Briefly, it describes a genuine single-knob control, which is not only more convenient to use than several separate knobs, but is also claimed to be more efficient. Tuning, volume, tone and selectivity are all controlled very simply with one hand, and tone balance, therefore, is always automatically correct. It is claimed that with this new control listeners are enabled to get the best possible results. Another important feature of the Mullard range of sets is their new acoustic design of cabinets.

The most popular of the new Mullard sets, it is predicted, will be the MAS8, which is an all-wave model. The new "Magiccontrol" single-knob principle is only one of the many dominant features associated with this model. It has a triple diode circuit; duo-speed tuning; cathode-ray tuning indicator; tone diffuser; a "disappearing scale," illuminated and accurately calibrated with station names and wavelengths, and which shuts away out of sight when not in use; bass response switch; illuminated waveband indicator; gramophone pick-up sockets; and extra loud speaker sockets.

The battery model MB3B, is priced at seven guineas (exclusive of batteries), the superhet MBS3 at nine guineas (also excluding batteries), and the mains-operated models (all-wave) range from seven guineas and upwards in stages of nine, twelve-and-a-half to the MAS8 at fifteen guineas.

PHILIPS LAMPS, LTD.

Stand No. 68.

Various refinements have been added to the well-known Philips models, mainly with a view to simple tuning, etc. All the new models are all-wave receivers, and the range consists of seven table models, one console, and three radiograms.

PILOT RADIO, LTD.

Stand No. 84.

The Pilot all-wave model No. U.385 is one of many on view and has as its outstanding features natural tone and power. Special phase inversion circuit and push-pull output provides unexcelled tonal qualities. Adjacent channel selectivity gives perfect reception of all worthwhile programmes. The reception of America, Japan and all world-wide transmissions assured by high sensitivity on all wavebands.

It has provision for gramophone pick-up and is an 8-valve superhet with fast and slow motion tuning, automatic volume control, variable tone control, adjacent channel selectivity obtained with circuits using iron cored inductances. It has a 6 watts output, and is housed in a cabinet of modern design.

PORTADYNE RADIO.

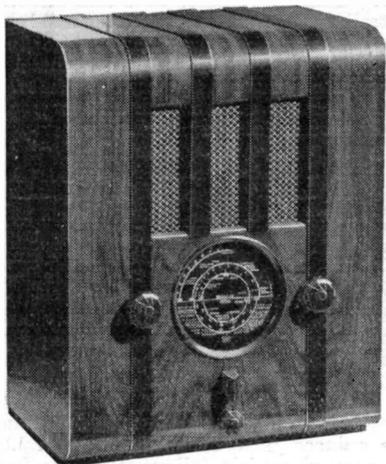
Stand No. 18.

The range of Portadyne receivers includes a number of all-wave models, and in this class is an inexpensive 3-valve battery model that should arouse considerable interest. Having wavebands of 16.48 metres and up to 2,000 it is of the horizontal type and has a distinctive appearance.

PYE, LTD.

Stand No. 60.

An extensive range of receivers and radiograms are to be seen on this stand, from the 8-guinea "Baby" to a 35-guinea auto record changer gram. We imagine the model most likely to interest our readers to be the Q.AC5, for here we see a receiver tuning down to 6.5 metres, a new feature that is a practical achievement. Price 18 guineas.



Other interesting exhibits of short-wave interest: Q.AC3, 15 to 55 m.; Q.TRF, 16-51 m., £8 5s.; Q.B3, 15-51 m., 12 guineas; Q.U3, 16-51 m., 12 guineas; and the QP.B and QP.AC, 15 and 16 guineas respectively. Note the significance of model numbers, for instance Q.U3 is to be recognised as a universal mains 3-waveband receiver. All of course incorporate medium- and long-wave ranges.

RADIO GRAMOPHONE DEVELOPMENT, LTD.

Stand No. 67.

The nine different models on view at this stand are all of the all-wave variety. Ranging in price from 16½ to 120 guineas for a radiogram, each receiver is built on the most modern lines, and has the many refinements that make for easy tuning and control. There is also on view the R.G.D. anti-static all-wave aerial equipment.

RADIOMETERS, LTD.

Stand No. 162.

Every amateur should visit this stand. Valve testers and other instruments provide much interest.

REGENTONE PRODUCTS, LTD.

Stand No. 97.

The Regentone 5-valve all-wave mains portable is one of the interesting sets on view at this stand. The circuit comprises triode hexode frequency changer, screened grid h.f. pentode as intermediate frequency amplifier followed by a double diode triode, high slope pentode power output and rectifier, with a range of 16 to 2,000 metres arranged in three wavebands. Two self-contained aerials are fitted, one for short waves, the other for medium

and long; variable tone control; large size permanent magnet speaker; 2 watts undistorted output, and provision for external aerial.



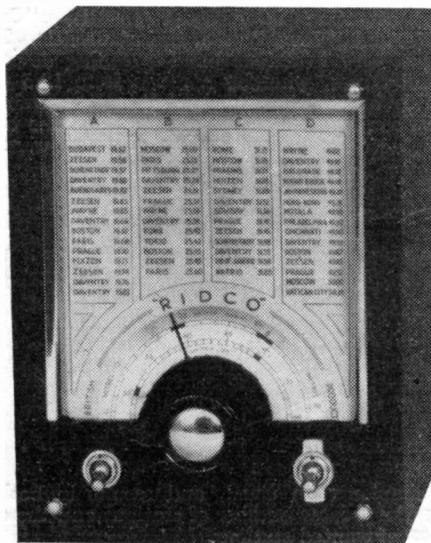
By the use of a carefully developed circuit arrangement, the two self-contained aerials and a powerful valve combination, having six separate functions, this receiver measuring only 11 in. x 12 in. x 8½ in. provides performance which is equal in sensitivity and quality of reproduction to instruments of standard size of similar type. The set weighs but a few pounds, is neat and compact, and with carrying handle, may be taken from room to room as required.

Of particular interest is the new short-wave converter (illustrated). It is supplied for a.c. or d.c. for the moderate price of £4 19s. 6d. or may be purchased by monthly instalments.

RIDCO RADIO INDUSTRIES DEVELOPMENT CO.

Stand No. T9.

The new "Ranger" short-wave converter model employs a triode-hexode frequency changer and



tunes from 12-60 metres in two wavebands. Output to the receiver is taken via a choke-capacity

circuit of improved design. The leading feature is the large fully illuminated dial. Over 50 short-wave stations are indicated, being grouped into four columns, representing the 19, 25, 31 and 49 metre bands. These bands are marked on the wavelength scale.

Model AC/R is for a.c. mains receivers, and B/R for battery receivers. An a.c./d.c. model is also available known as the U/R, this unit incorporates its own power pack, and is suitable for any receiver of British, American or Continental design.

The new "Cub" is an autodyne type of converter, and employs an ordinary triode valve. The wave range is 19-50 metres. An interesting feature is the use of fixed reaction, making the unit one-knob control.

The full range is being exhibited by Messrs. R. Cadisch and Sons, the wholesalers, on their stand T9.

SIEMENS ELECTRIC LAMPS & SUPPLIES, LTD.

Stand No. 31.

A complete range of the well-known "Full O'Power" batteries may be seen on this stand, the exhibit comprising types and sizes suitable for practically every make of battery-operated radio receiver.

The "Cadet" Series is intended for modest sets taking 6 to 7 milliamperes, and Power Type Triple Capacity for sets consuming 12/15 milliamperes. In addition, there are special types of double capacity batteries for superhets and receivers with Class B or QPP output stages.

As a matter of interest it should be noted that "Full o'Power" radio batteries utilise seamless drawn zinc which has many advantages over the soldered variety. Examples of these zincs should be inspected. The literature available includes a useful reference list of special replacement batteries for various makes of sets.

'SOUND SALES, LTD.

Stand No. 89.

In addition to a great variety of transformers and chokes, together with many new models, Sound Sales are exhibiting a re-designed version of their well-known 4-12 watt quality amplifier. One of the outstanding exhibits is a radio gramophone having an undistorted output of 6 watts and housed in a special three-cornered cabinet. Another exhibit is

THE RADIO VALVE CO. LTD.,
362 324/6, LIVERPOOL RD., N.7.
 NORTH 1853.

LATEST RELEASE. **SR4** Fil. Volts 4
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 An. Volts 300 Max.
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- TRANSMITTERS—
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STAND 214 RADIOLYMPIA



"RELIANCE"
 specified for the
"IDEAL RECEIVER"

A well-known designer said:—
 "One of the most important components in a modern television or short-wave radio receiver is the potentiometer for volume or voltage regulation.

We have experienced the utmost difficulty in obtaining resistances for this purpose, but we have at last found in 'Reliance' a range of these components that have solved our difficulties." In Reliance Volume Controls silent operation is achieved by an exceptionally springy contact exerting a light but firm pressure over a very small area of resistance element.

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- 3 Type T.W. Linear
- 50,000 ohm ... 4/6
- 1 " " 500 ohm ... 4/6
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 "S.W." on Potentiometers



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 SPECIALISED RESEARCH
RELIANCE MANUFACTURING CO.,
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a special "Tri-Channel" amplifier, which is incorporated in Sound Sales latest quality equipment, styled "Tri-Channel Amplification."

In addition to the well-known 4-6 watt and 14 watt amplifiers a new amplifier employing K.T.66 or equivalent type beam power valves is exhibited. The latest model gives an undistorted output of 35 watts with a straight line frequency response from 20 to 15,000 cycles. P.A. enthusiasts will be interested in the new P.A. speakers, especially the metal diaphragm units and the new telescopic pylon which is in reality a tripod with telescopic legs. A new lapel microphone also makes its appearance, together with a combined crystal microphone and line transformer. A number of special exhibits are also on view, including a special rack and panel equipment built for the International Corporation.

STEATITE & PORCELAIN PRODUCTS, LTD.

Stand No. 152.

Ceramic insulating materials, Frequentite and Faradex. This exhibit includes coil formers, trimmer bases, aerial and stand-off insulators, condenser spacers, terminal strips, bushings and washers, beads of all sizes for bare wire insulation, and a series of large pieces for high power short-wave transmitters. There are also interesting exhibits of silver fired directly on to ceramics and the application of this process to coils, trimmer condensers, etc.

STERLING BATTERIES, LTD.

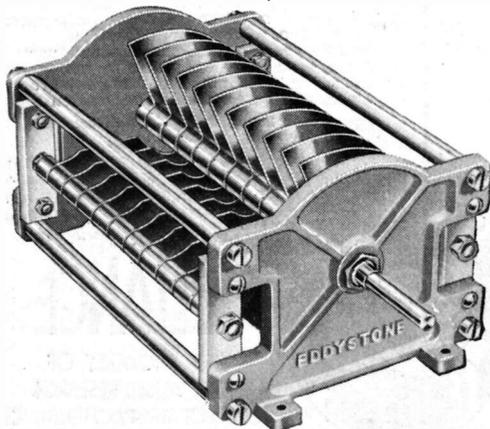
Stand No. 5.

Are showing a range of Sterling Accumulators principally for portable sets, and there is also a full range of lighting batteries.

STRATTON & CO., LTD.

Stand No. 23.

Stand No. 23 will of course be visited by all our constructor readers attending Olympia, where they will see once again the premier short-wave component display, always a feature of Messrs. Stratton's exhibit.



The standard and well-known lines are still to the fore and look to remain for many seasons yet. An

advance in recapturing the component market from American manufacturers is apparent from the new transmitting condensers that are displayed. Our illustration is sufficient to show the effort involved at once created a British counterpart to the popular overseas high voltage types that have been used by hams extensively in the past.

The 2½-inch instrument knob will find favour as also will the precision slow motion dial (1069) with its 4-inch silver-plated brass scale which has machine cut graduations read against a separate cursor line indicator mounted on the panel.

All components are of the same high standard associated with the name Eddystone and will last for years, despite the hard usage subjected by changing from one design to another.

THE TELEGRAPH CONDENSER CO., LTD.

Stand No. 38.

T.C.C. exhibit includes ranges of all types of mica and paper fixed condensers, including non-inductive paper tubulars, together with special types for use under tropical conditions and for car radio work; electrolytic condensers from 12 volts to 550 volts working, the former being contained in waxed cartons, metal boxes and aluminium cans.

A feature is made of the surge-proof "voltage regulating" wet electrolytics, including the new 32 mfd. pattern and the types specially designed for use in a.c./d.c. receivers.

All sizes of moulded mica condensers up to and including .01 mfd. capacity are available with wire ended connections as an alternative to the standard soldering tag type.

TELSEN ELECTRIC CO. (1935), LTD.

Stand No. 90.

This exhibit comprises a wide range of apparatus, which includes meters of all descriptions, service equipment, microphones, battery chargers, short-wave converters, dipole aerial kits, etc., etc.

THE 362 RADIO VALVE CO., LTD.

Stand No. 210.

The various types of 362 valves are all on view. Transmitting types that should interest our ham readers; there are also circuit designs for demonstration of the correct use of valves.

Our readers will also see on this stand THE SHORT-WAVE MAGAZINE two-valve super-regenerative receiver described in our April issue.

ULTRA ELECTRIC, LTD.

Stand No. 63.

In addition to a number of de luxe all-wave—television and sound models—Ultra are this year showing an all-electric superhet with three waveband tuning, 16.8-50, 200-550 and 900-2,000 metres. The dial is wave-length calibrated in different colours, with stations marked on medium and long waves. Epicyclic slow motion tuning control. Delayed automatic volume control. Provision for gramophone pick-up. Sockets for external speaker with internal speaker switch. A highly sensitive all-wave superhet receiver that commands attention.

WESTINGHOUSE BRAKE & SIGNAL CO. LTD.

Stand No. 77.

On this stand a number of new radio type rectifiers are introduced to the public. For high tension there are a complete range of new units, H.T.14, 15, 16 and 17. These are all without the familiar blue perforated metal casing, and replace all the old cased types which are now discontinued. While giving the same outputs, this new method of construction has enabled the prices to be substantially reduced. On the low tension side, five new units are introduced; L.T.7, 8, 9, 10 and 11, with various outputs now ranging from 2 volts 0.5 amp up to 12 volts 2 amps. The L.T.8 replaces the old L.T.2, now withdrawn.

A full range of "Westectors," and "H" and "J" type high voltage rectifiers, and instrument type rectifiers, are also on view. No changes or additions have been found necessary to these units.

WESTON ELECTRICAL CO., LTD.

Stand No. 167.

Instruments by Weston are always of interest to the amateur and service man, and two that command particular attention are the new "Super Sensitive Analyzer" No. E772, also the "Super Oscillator" No. E692.

Meters are indispensable units, and as there are numerous types on exhibit here, the amateur will find many items of interest.

WHITELEY ELECTRICAL RADIO CO., LTD.

Stand No. 75.

The stand is particularly notable in that as well as a completely new range of the well-known Stentorian type of speaker the exhibit includes a fairly comprehensive range of receivers—an entirely new activity of this Company.

Dealing first with the traditional W.B. market, a large part of the display contains the improved extension speakers with new cabinets, and also a "Long Arm" remote control of similar external appearance to last year's accessory. It will be remembered that this, when used in conjunction with any but the smallest Stentorian cabinet, enables the listener to operate the set's on/off switch from the extension point.

Stentorian receivers, also prominently displayed, are designed with special regard to the Company's reputation for high tone fidelity.

Most novel amongst the chassis loudspeakers shown is the new "Planoflex"—a completely new design suitable only for use with quality amplifiers.

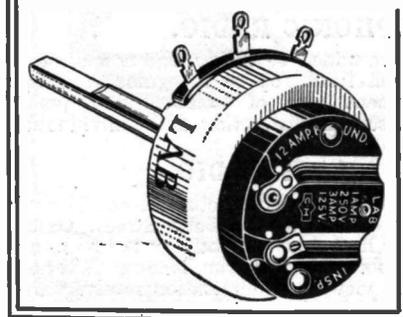
WINGROVE & ROGERS, LTD.

Stand No. 44.

Polar condensers of every conceivable type are on this stand, and the amateur will find much of interest. There is also exhibited the well-known Weartite components which include some excellent testing instruments.

THE

LAB VOLUME CONTROL



- Less Switch 3/-
- With Switch 3/6
- With Double Pole Switch 5/-

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RADIO RESISTOR COMPANY LTD

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LOGARITHMIC OR LINEAR TYPES

A Volume Control of outstanding merit offered by a firm well known for quality resistance products. Supplied with special 1 3/4" spindles for cutting to required length. All values from 2,500 ohms to 2 megohms.

NOTE !

"SHORT-WAVE MAGAZINE"

specifies

ERIE RESISTORS

Only the best will do for the "IDEAL" Receiver described in this issue. Erie Resistors are specified. Eries will never let you down. That's why they are used by leading designers and manufacturers.

All values 1/- per watt.

NOT AT OLYMPIA

For various reasons a number of firms do not exhibit at Olympia, and the concerns mentioned below are among that number. We invite our readers to apply for the literature which is available in each case.

A.C.S., LTD.

A.C.S. Ltd., for the forthcoming season, will continue their established policy of providing short-wave amateurs with only the best of equipment, including all the well-known and internationally popular American communication receivers. A special feature of their services is the "hotting-up" and aligning of every receiver in their own laboratory before despatch, thus ensuring for the user the maximum performance of which these sets are capable. This equipment is offered at attractive prices with full facilities for part exchanges, easy payments, approval and free demonstration. A.C.S. Ltd. also specialise in amateur transmitters and equipment and construct special apparatus to order. A full range of popular components is carried in stock and the technical manager, G2NK, offers free advice to amateurs on their technical problems.

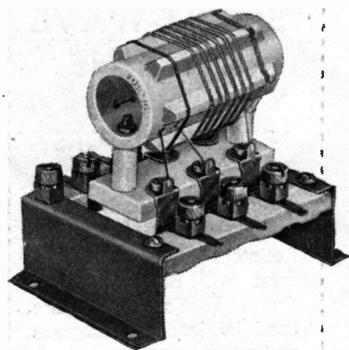
An attractive loose-leaf folder containing data sheets covering receivers, transmitters, etc., will be sent free to any reader on application to the Head Office, 52, Widmore Road, Bromley, Kent.

CHAPMAN & HALL, LTD.

So many technical books dealing with radio have been published that it is impossible to enumerate them here, we therefore advise readers to send for the leaflet "Standard Books on Wireless," which can be obtained from 11, Henrietta Street, London, W.C.2.

GRAHAM FARISH, LTD.

We illustrate a product of Messrs. Graham Farish that will find useful application in short-wave construction, whether for receiver or transmitter design.



The uses are many and ideas will present themselves to the keen fan who requires a neat and efficient coil unit. The former can be had unwound and the stand is also obtainable for accommodating two formers and a switch for placing either coil in circuit.

A fully illustrated catalogue (post free, 1½d.), shows a wide range of high-grade components. Address: Mason's Hill, Bromley, Kent.

PHILCO RADIO.

The Philco series of receivers, of which there are 28 models, range from £6 for the People's Battery Set (Model 333) to a 22-valve set which costs 120 guineas. Three important additions have been made recently. These models include the "Empire Five" Model A.537 in the Concert Grand and Radiogram cabinets and the de luxe "Empire Twenty-Two" Model 2258 Radiogram in three types of cabinet.

RADIO RESISTOR CO., LTD.

In the Ideal receiver our constructional staff have specified Erie resistors. Radio Resistors, Ltd., who are the makers, also market the L.A.B. volume control which has outstanding merit. It is supplied with special 1½-in. spindles for cutting to required length, and is supplied in all values from 2,500 ohms to 2 megohms.

RAYMART MANUFACTURING CO.

Those of our readers who live in the Midlands or the North, and who will not be able to travel to Olympia, should ask Raymart Manufacturing Co., of 44, Holloway Head, Birmingham, 1, to send particulars of their new season's components. There is also an interesting 6-page leaflet to be had illustrating the RF.60 professional transmitter kit. It should be of interest of our readers to know that Raymart is controlled by G5NI.

TRUPHONIC RADIO, LTD.

This firm have added to their range new all-wave models that sell from 10½ to 23 guineas. Every modern refinement both of technical and quality value, give these sets distinction and individuality.

WEBBS RADIO.

On the way to, or on your return from, Olympia call at Webbs' Radio at 14, Soho Street, Oxford Street, W.1, for here you will find a complete miniature radio exhibition. All the leading American products are on view—communication receivers that you will not see elsewhere and, of course, the full range of Eddystone products.

WILKINS AND WRIGHT, LTD.

"Utility" immediately impresses slow-motion dials and switches upon the radio constructor's mind. There are no alterations to record in these well-known high grade components, which is sufficient proof of the thoroughness with which the designers looked ahead. Price has an important bearing and for 7s. 6d. the micro dial No. 181 represents good value. Ratio is 100-1, the frictional drive is guaranteed free from backlash and the real hair line allows readings to be taken from the subdivisions of the open scale.

GUIDE TO THE WORLD'S SHORT-WAVE BROADCASTERS

(listed by Continent)

Compiled for "The Short-Wave Magazine" by F. A. BEANE

All times are given in G.M.T. for convenience. It is suggested that readers file these panels for future reference. Any additional stations, or modifications will be given from time to time to keep the list up-to-date.

LATIN AMERICA

COGF, MATANZAS (Cuba)

Metres: 25.42; Kc.: 11,800. Power: 1,000 w.

Operating schedule: no regular operating hours yet, but may be heard between 21.00—05.00.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 4,200 miles.

Postal address: Estacion, Radio-Transmisora COGF, Gral. Betancourt 51, Matanzas, Cuba.

Identification characteristics: employs slogan "La Voz de la Provincia", or the announcement "Emisora CMGF Onda Larga y COGF Onda Corta en Matanzas, Republica de Cuba; La Voz de la Provincia". Relays CMGF.

Verification of reception reports: verifies with neat card.

CO9JQ, CAMAGUEY (Cuba)

Metres: 34.62; Kilocycles: 8,665. Power: 150 w.

Operating schedule: 16.30 — 17.30; 22.30 — 23.30 and 01.00—02.00 daily.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 4,200 miles.

Postal address: P.O. Box 64, Camaguey, Cuba.

Identification characteristics: announces in English as "This is Short-Wave Station CO9JQ in Camaguey, Cuba". A bugle call is used occasionally and a single chime intersperses announcements. Relays CMJA.

Verification of reception reports: difficult to obtain confirmation from.

COCO, HAVANA (Cuba)

Metres: 49.92; Kilocycles: 6,010. Power: 2.5 kw.

Operating schedule: 13.00—05.00 daily.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 4,200 miles.

Postal address: P.O. Box 98, Havana, Cuba.

Identification characteristics: announces at regular intervals in English as "Short-Wave Station COCO, P.O. Box 98, in Havana, Cuba"; 3 chimes; occasional bugle call and mention of "R.C.A. Victor". Relays CMCF.

Verification of reception reports: verifies with view of Havana.

COJK, CAMAGUEY (Cuba)

Metres: 34.62; Kilocycles: 8,665. Power: unknown.

Operating schedule: believed to be 01.00—03.00.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 4,200 miles.

Postal address: thought to be Finlay No. 3, Camaguey, Cuba.

Identification characteristics: three chimes like those of the N.B.C. and bugle call. Relays CMJK.

Verification of reception reports: it is not yet known whether this station will verify.

COCW, HAVANA (Cuba)

Metres: 47.93; Kilocycles: 6,330. Power: unknown.

Operating schedule: at present testing until 06.00.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 4,200 miles.

Postal address: P.O. Box 130, Havana, Cuba.

Identification characteristics: frequent announcements in English during tests, and reference to the slogan "La Voz de las Antillas". Relays CMW.

Verification of reception reports: requests reports and will, no doubt, verify.

COBZ, HAVANA (Cuba)

Metres: 33 approx. Kilocycles: 9,030 approx.
Power: unknown.

Operating Schedule: not yet announced, but may be heard until 06.00. Will probably be 12.00—05.00 later as CMBZ from whence programmes will be derived.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 4,200 miles.

Postal address: Radioemisora COBZ, "Radio Salas", San Rafael 14, Havana, Cuba.

Identification characteristics: Relays CMBZ; employs slogan "Radio Salas", bugle call and broadcasts "R.C.A. Victor" programmes frequently. During tests the call is given in English as "This is Havana, Cuba, COBZ, C as in California, O as in Ohio, B as in Boston, and Z as in Zealand". Occasionally tests with COJK, Camaguey.

Verification of reception reports: will, no doubt, verify.

COKG, SANTIAGO DE CUBA (Cuba)

Metres: 48.39; Kilocycles: 6,200. Power: 2,400 w.

Operating schedule: 22.00—23.00 and 05.00—06.00.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 4,200 miles.

Postal address: P.O. Box 137, Santiago de Cuba, Cuba.

Identification characteristics: relays CMKG; employs both male and female announcers.

Verification of reception reports: sometimes difficult to obtain.

CB615, SANTIAGO (Chile)

Metres: 24.4; Kilocycles: 12,300. Power: 1,000 w.

Operating schedule: 15.00—17.00; 20.00—24.00 and 02.00—03.00.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 6,850 miles.

Postal address: Desmaras y Cia. Ltda., Bandera 176, Casilla 761, Santiago, Chile.

Identification characteristics: frequent reference to "Radio Service", or to "Santiago, Chile". No mention is ever made of the call-sign. A four chime signal is sometimes employed.

Verification of reception reports: confirms reports with attractive card of map type.

COHB, SANCTI SPIRITUS (Cuba)

Metres: 47.77; Kilocycles: 6,280. Power: unknown.

Operating schedule: 14.00—15.30 and 17.30—03.00; Catholic Hour at 03.00 Mondays.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 4,200 miles.

Postal address: Radioemisora COHB, Independencia No. 33, Sancti Spiritus, Cuba.

Identification characteristics: employs train noises, chimes, sirens, baby crying recording, etc. Relays CMHB and the "R.C.A. Victor" programme from CMQ 21.00—22.00.

Verification of reception reports: the compiler does not know of anyone possessing confirmation of reception.

CB960, SANTIAGO (Chile)

Metres: 31.25; Kilocycles: 9,600. Power: unknown.

Operating schedule: 15.30—17.00 and 23.00—01.30.

Standard time: G.M.T. less 5 hours.

Distance from London: approximately 6,850 miles.

Postal address: Radioemisora CB960, Apartado 1343, Santiago, Chile.

Identification characteristics: reference to the slogan "El Praco"; occasional announcements in English; opening selection "Babes in Toyland"; closing selection "Rhapsody in Blue".

Verification of reception reports: it is not known whether this station will verify.

AROUND THE HAM SHACKS

I—G5LK

We commence this series with a station description by Mrs. Leslie Knight, wife of G5LK

THE STATION G5LK is situated in the valley of the ever popular Surrey beauty spot, Reigate Hill, and as far as reception and communication via radio telegraphy and telephony is concerned it is generally considered by the operator as being all that could be desired.

After operation for four years under an A.A. licence, this station has been active with full radiating facilities just on two years.

Amateur radio has had a deeper meaning for G5LK than it does to the average amateur. After the misfortune of losing his sight under somewhat tragic circumstances our kind friends the G.P.O. handed second sight to him, on granting him the privilege of full radiating facilities. It is a great compensation to know that there are hundreds of fellow "hams" willing to co-operate or render service at any time.

● Transmitter Line-up

The present line-up of the tx comprises two stages: c.o., employing an American 42, and p.a. an 801, using regeneration in this stage; the tx is fully screened. The system of modulation is Heising, a British DO24 being employed as the modulator valve. Driving the DO24, all resistance capacity coupled, we have a two-stage speech amplifier, an AC2HL into an MH4, and each stage employs separate power supply.

It may be interesting to readers to know that by experiments in correct matching it is possible, with the small amount of audio, to modulate 20 watts of carrier at a linear position.

[Full theoretical modulator power is only necessary for high quality music transmission; for speech, peak modulating at 100 per cent., only 25-33 per cent. of the same modulator power is required.—Ed., "S.-W.M."]

● Experimental Work

The microphone generally used is the G1 transverse-current type, via a 30 to 1 coupling transformer, nine volts. excitation. The chief experiments carried on at this station deal with aerial problems, many types being used; the one proved most successful, and being used at the present moment on the 14 mc. band, is known as the John-

son J. The aerial consists of a 66 ft. 6 in. top, direction N—S, 100 ohms line feeding into a $\frac{1}{4}$ -wave to frequency, 6 inch spaced stubb at the southern end, the feeder line being link-coupled to the tank of the tx.

● Results Obtained

The whole of the W districts have now been worked on this aerial, including the elusive W9UEL in Colorado, VK on four occasions, South America and Canada also being "in the bag," and ail on phone. The input is genuinely never more than 20 watts. For reception, the Hallicrafter Super "Sky Chief" is used.

To all amateurs reading this article, and those with whom G5LK has made contact, he would like through our kind friend and Editor, G5GQ, to thank them sincerely for their kind co-operation.



On the Amateur Bands

"Ham" News by G5GQ

THE NUMBER of readers of this column is increasing by leaps and bounds, there now being three! At least that is the number who have written me this month and without the aid of a slide rule I have been able to count them accurately.

If only a few of those who complain bitterly of the state of the forty-metre band at local club meetings would come forward and help the good work we might make it a band fit for both heroes and hams. On Sunday mornings it takes a hero to try and cut through all the wobblelation, over-modulation, modulated c.w., and spitch! We want the support of the public, who, now that all-wave sets are coming into general use, listen to our transmissions. What must they think of ham radio after one excursion to forty metres on a Sunday? With public opinion on our side we could get far more concessions than all the representations we now make do.

John Citizen thinks that a ham is a public nuisance causing interference to his reception and wasting valuable frequencies which might better be used for more short-wave broadcasters. Phone stations have the only real chance of proving that amateur stations can turn out decent transmissions, but do they? Listen to forty. As one of our American friends remarked, "Ninety per cent. of the amateurs on the ether ought to be under it."

● Keep our Bands

One of my correspondents this month is G8GG, who suggests starting a "back to 1.7 movement." He says: "How about starting a campaign to get more use made of 1.7 mc. at other times than Sunday mornings or late night? As there seems to be a good chance of losing at least part of the band the more activity that can be shown the better."

G8GG is secretary of the Blackpool club, so here is a good chance for some of the other clubs to wake up their members and get them back on 1.7 for at least part of their time. Local secretaries are in personal contact with members and have every opportunity to persuade them to come on. It is a local band, so let the clubs prove their usefulness. R.S.G.B. succeeded in getting nearly 250 during the tests, but they can't chase them up individually during the year.

G6CL says he thinks many of them are afraid of local QRM and suggests using low-power c.w., which would carry right across the country.

Well, the idea is before you now, so how about it? The simplest of crystal oscillators would be sufficient. To start the ball rolling I am going to put one of my "6A6" transmitters on this band. Now please have a shot at it. Drop me a line if you're interested and perhaps we can then arrange schedules during b.c. hours. If only a dozen of us

QSO two or three times a week to begin with, others will soon follow.

● PY1AW

My remarks about old timers last month brought me a letter from G2KI, telling me that PY1AW died early this year. 14 mc. will never seem the same without him. He was all that a ham should be. I remember him writing to me many years ago saying that he was an old man to whom amateur radio was the means of keeping in touch with the many radio friends he had made. Putting a fine signal into all continents he scorned dx for dx sake, preferring to stay and chat. He was an example of a true amateur, a gentleman on the air as well as off it. Many of us will mourn his passing. Thank you for the letter, G2KI, even though it did bring unwelcome news.

● As others See us

Working a W1 the other night he just gave me my report and signed off. As he appeared disinclined to talk I also signed off, but concluded with a few idle remarks about some tests I had been doing. To my surprise he came back again and remarked that he had only signed off so abruptly because he thought every G5 only lived for dx, but would like to stop and continue.

● Conditions

Variable conditions have coincided with variable weather. Some mornings the air has been full of W6's and W7's, others conspicuous by their absence. Some mornings they have been coming through as late as 10 a.m. W5KC has been very consistent, being heard both when the W6's are through and also when only the VK's are heard. Europe-VK contacts have not been too good, W6 predominating out there. VK3XP tells me that they are waiting for ten to re-open and are now getting ready to troop down there. Looks as if there will be a lot of QRM on ten when it does open.

Best effort of the month is that of G5HI, who, calling "test" on 7 mc. around midnight with about 8 watts, was amazed to have an HK5 come back! So dx is possible on this band in August.

All bands have been dead during the day, 14 mc. in particular. 14 mc. suddenly wakes up about midnight. At five minutes to it's pretty quiet, W's being about R5, and then at midnight their strength suddenly goes up to R9.

● Pirate?

One of the W's told me of working HZ5N. This is a new one to me but perhaps some of you may have heard the call. There are a lot of funny ones going round just now, but if it amuses them, gives the "worked 150 country" merchants something to argue about, and doesn't worry us, who cares?

From S.W.L. to Full Licence — I.

As each article is written and each experiment described, the author will have actually just reached that stage. So you will follow his progress until the final "on the air" tests

THE OBJECT OF this series is to show how it is possible to advance by easy stages from a short-wave listener to what is every enthusiast's aim—the possessor of a full transmitting licence.

● In the beginning

It is several years now since I was first introduced to the short waves, through the medium which must have led so many others. I became dissatisfied with the results obtained on the broadcast band, and confided to a friend that I didn't think 3 a.m. the most comfortable time to do dx listening. He looked vastly superior, and then began to describe the joys of the short waves.

The long and the short of it was that I built a s.w. set, put on a pair of phones and listened. The first day I heard nothing but on the next Sunday morning I was rewarded with a voice from Heckmondwike: if it had been ZL I couldn't have been more delighted.

From that receiver I passed to a slightly better one, and then to a commercial receiver which I am using now. My interest went from broadcast listening to amateur, and then I began to think of joining their ranks.

● The Form

At last a great step was taken, and after application to The Engineer-in-Chief, Radio Section, G.P.O., Armour House, London E.C.1, the Artificial Aerial form arrived. As that is rather an important document to the beginner, we had better consider it fully.

The fee for the licence is 10s. per annum, which payment does not cover the receiving licence you now hold. If you are a junior then it will be necessary for your parent or guardian to sponsor your application until the age of 21 is attained.

The first question on the form requires you to describe yourself, and is quite straightforward. It also states that evidence of British nationality and two recently written references as to character must be enclosed, so if you have any murders on your conscience it will be as well not to apply!

Question two deals with any qualifications in science, radio transmitting experience, or radiotelegraphy proficiency certificates you may possess. The speed at which you can send and receive Morse is asked, but this is not required for an A.A. licence.

The fourth question is the most important of all. It is worded "General outline of the nature and object of the experiments which it is desired to conduct with the sending apparatus." Now, it won't do to say you want to chat with Bill in Australia, and save the telephone charges, even if you do!

During the term an artificial aerial licence is in existence transmissions must not radiate beyond the licence holder's premises; but any experiment may be conducted and tests made with the use of a "dummy" aerial, which I shall mention next month.

The experiments can be such that they may be of use in opening up new bands of communication. An amateur station first showed the communication value of "short waves" of three or four hundred metres.

The production of new transmitting circuits, modulation and keying experiments may all prove of great ultimate value, while among the most frequent objects are the use of ultra high-frequencies, and aerial design.

Above all, whatever you decide upon be sure that your experiments will be of use to the short-wave fraternity.

● The Transmitter

After that, we come to details of the apparatus to be used. These are largely a matter of personal taste, but remember the Post Office allows a beginner only 10 watts input to the final valve, and that you will want to have something more pretentious in time. An accurate means of frequency measurement is required: this is usually accomplished by means of a quartz or tourmaline crystal.

Next comes the power supply and type of waves to be used. Spark and unrectified a.c. transmissions are forbidden, so we are limited to c.w. and telephony.

The last details required are those relating to the aerial, the type and dimensions of which must be described. In this country the length of aerial is limited to 150 feet.

The call granted will be the figure 2 and three letters; there is no time limit for the retention of this call but it is generally recognised that a period of three months should elapse before graduating to full licence.

Next month I hope to be in possession of a three-letter call, and to be able to tell you about my first experiments, complete with pitfalls and successes.

TRY THESE PORTABLE CIRCUITS

By CYRIL R. GREENLAND (BRS1818)

THE SHORT-WAVE enthusiast need no longer forsake his set when taking a holiday; even if he does not own a car, it is possible to compress the set into quite reasonable dimensions, say a small attaché case, and it is with this idea in mind that the circuits here described have been evolved. The listener can thus take advantage of the more favourable reception conditions which seem to be available when near the sea.

The simple one-valve shown in *Fig. 1* has a number of disadvantages for portable work: the output is comparatively low, extra precautions have to be taken to avoid capacity effects, and the tuning whilst out in the open air is rather tricky. The other circuits are an attempt to overcome some of these disadvantages.

Fig. 2 makes use of a small pentode valve, practically any make being found to oscillate with only 18 volts h.t. and 1½ volts l.t. Two grid bias batteries will thus suffice for the high tension, while a dry cell can be used in place of an accumulator. The weight of this portable is therefore very little, while the output from the pentode has been found sufficient to operate two pairs of 'phones. All the components are standard and can be laid out along a narrow baseboard which, together with the panel, should be of aluminium or other suitable metal. To obtain smooth reaction it may be necessary to reverse the leads to the l.t. battery. A set made up on these lines was fitted easily into a case 13 ins. x 7 ins. x 3½ ins. together with batteries, coils, aerial wire and two pairs of 'phones.

Fig. 3 shows an entirely different type of circuit—a super-regenerative set. Its advantages are ex-

remely loud signals, easy tuning and absence of hand-capacity. A 60-volt h.t. battery is however necessary. The components are standard with the exception of the quenching coils, each of which consist of approximately 1,500 turns of fine wire on a suitable former, this being of any convenient shape. Circular pieces of card, 4 ins. diameter and separated ¼-in. by a small wooden centre piece, are perhaps the easiest to construct. The quenching coils should be fitted one above the other, but not fixed until the set has been tested.

After switching on, a high-pitched whistle should be heard, which changes into a hissing noise as the reaction condenser is turned. The relative positions of the two quenching coils should be adjusted until the high-pitched whistle is only faintly audible, while increased reaction gives first the hissing noise followed by the set going into oscillation. If the coupling between the two coils is insufficient, an increase in reaction will only cause a loud roar, which is better left undescribed!

After tuning a straight set, it may take a little time to get accustomed to tuning the super-regenerative circuit, but if difficulty is experienced at first in finding a station, a good plan is to fit a switch in parallel with the quenching coils so that these can be cut out at will. A station can thus be tuned in and then the coils switched into circuit, when the station should come in at approximately the same reading only at greater strength.

Four-pin tuning coils are most suitable for these sets as they take up the minimum amount of space. Commercial coils can be used, but if the constructor wishes to make his own, the winding details, using

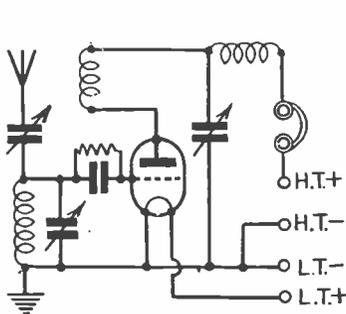


Fig. 1.

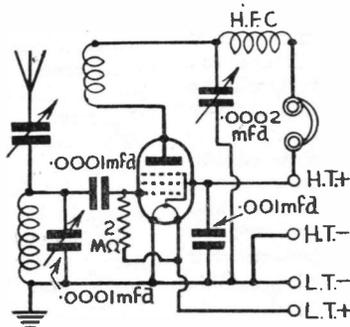


Fig. 2.

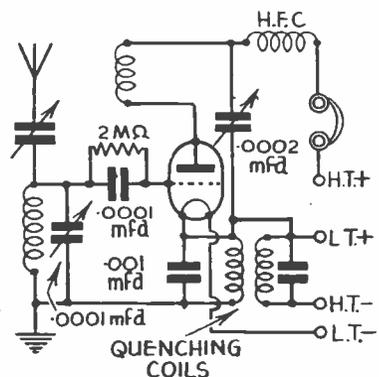


Fig. 3.

“Eddystone” 8-ribbed threaded coil formers, are as follows:—

<i>Approx. Range.</i>	<i>Grid Coil Winding.</i>	<i>Reaction Winding.</i>
16-32 m.	5½ turns 18 S.W.G. bare wire (or “Glazite”).—Space of one groove between each turn.	6 turns 36 S.W.G. S.S.C. wire. 2 turns per groove.
30-70 m.	12½ turns 24 S.W.G. enamelled wire. — 1 turn per groove.	9 turns as above.
70-150 m.	29½ turns 24 S.W.G. enamelled wire.—Close wound.	15 turns, as above.

The two windings on each coil should be spaced about ¼-in. apart.

The aerial for a portable set may consist of a few yards of insulated wire, which can be slung over a convenient tree or other object. Sometimes, however, this starts to sway in the wind, causing variations in the tuning, and it has been found that on high ground there is scarcely any loss of signal strength with the wire simply laid out flat on the ground. An earth connection is not usually required.

It will be seen that the two designs suggested each have their own advantages for portable work; perhaps some interested experimenter will have a shot at combining the two circuits, and thus producing the ideal one-valver!

CLUB ACTIVITIES

A.-A.R. & T.S.

“The buoyancy of the American hearts far exceeded that of Salt Lake City” was how the Psychological Consultant of the Anglo-American Radio and Television Society, and a member of the NRS expressed his appreciation of Americans over W2XAF and W2XAD during a special broadcast made to the Anglo-American Radio and Television Society on August 11. Eugene Darlington, short-wave reporter, interviewed Mr. J. Louis Orton (the Psychological Consultant) and experiments which the Anglo-American Radio and Television Society, with his help, had conducted were mentioned. An A.-A.R. and T.S. announcement was also broadcast on August 10 from W2XAF and W2XAD. Medium-wave station WPG, Atlantic City, also notified that it proposed to transmit an A.-A.R. and T.S. concert during August. Particulars of society may be obtained from Miss E. G. Harris, Plemont, Greenway, Uxbridge.

BLACKPOOL AND FYLDE

During August the society has held no meetings, but the autumn programme is being organised for the weekly meetings which commence on September 2. A direction-finding field day is being organised for the autumn. It is hoped to compare results by using two transmitters, one on 7, the other on 56 mc. The club artificial aerial licence has at last come through with the call 2CYA and tests will be carried out with this.

Another A.A. call in 2CWW has been granted and gear is being gathered together. All the locals are preparing for renewed activities after the summer slackening of work.—F. FENTON, Hon. Sec., 25, Abbey Road, Blackpool, S.S.

BRADFORD

The Bradford Short Wave Club is very active, despite the summer weather, and experiments with the transmitter are carried out every Friday evening at the club rooms. The Morse class is considered almost finished, but those who have benefited are to carry on—anyone interested may join.

Some time ago a field day was held. This was very successful and another is to be arranged this autumn, if possible. Meeting are held at the Bradford Moor Council Schools on Fridays, from 7.30 to 11 p.m. Hon. Secretary: G. WALKER (2AWR), 33, Napier Road, Thornbury, Bradford, Yorks.

TOTTENHAM

The Tottenham Short-Wave Club has now been completely re-organised and all previous officials are replaced. The club will be glad to hear from persons interested in short waves. The secretary will forward any further particulars on receipt of a postcard to—EDWIN JONES, 60, Walmer Terrace, Firs Lane, Palmers Green, N.13.

WEYMOUTH AND DISTRICT

The Weymouth and District Short-Wave Club has recently been formed and is making steady progress. The membership includes five full radiating permits, one A.A. and one waiting to hear about an A.A. It is hoped that the club will shortly have its own transmitter. The construction of receiving apparatus is now in progress. Excellent commodious headquarters have been obtained at 15a, Hope Street, where prospective members will be welcomed at the meetings which are at present held as follows: Mondays at 7.30 p.m., Morse instruction; Wednesdays at 7 p.m., general meeting night and the construction of apparatus. The annual subscription for the Junior section (under 16 years) is 5s., and the Senior 10s., payable quarterly. An entrance fee of 1s. 6d. is charged.

Those interested and desiring further particulars are invited to write to the Secretary, W. E. G. BARTLETT, at headquarters address, 15a, Hope Street, Weymouth.

THE EARHART FLIGHT

The comments below, by courtesy of the American Radio Relay League, explain the sensational Press statements current during the end of this flight

Lack of 500 kc. equipment with which to transmit for the Itasca's direction finder when requested, may easily have spelled the difference between success or failure of this flight.

● No C.W.

KHAQQ was equipped for 500 kc. work but Miss Earhart decided to leave this equipment behind at Miami and depend entirely on her two radio-telephone frequencies, 6210 kc. (day) and 3105 kc. (night). She was reported to have said, "If either Fred or I could use the key it would be different. Since we can't, the antenna (250 ft. reel) would be just one more thing to worry about." So lack of both navigators in proper code knowledge and appreciation of the importance of communication in their plans may have much to do with this case.

Captain Manning, who started on the original Earhart flight in March had used the c.w. (500 kc. and h.f.) equipment effectively on the Hawaiian trip. News dispatches credit the Howland Island operators, entirely on their own initiative, with setting up special 3105 kc. direction finding equipment. Their report reads, "Special direction-finder manned all night, but we were unable to secure bearings due to Earhart's very brief transmissions and her use of voice."

● Reports never received

The two batteries carried by the plane were good for less than two hours' operation, without the right motor running. Batteries would be ruined quickly by salt water in a forced landing at sea. No transmission from water could conceivably be made. In the event of a land crack-up on an islet due to lack of petrol, the 550 h.p. wasp engine could be run for a very short period. There was no hand generator even if they had strength to run it. Much as all authorities have hoped otherwise, it is feared the carrier and signals reported are from diathormy or other spurious sources, or are reports on fragments of radio messages and discussions of outsiders about the disaster.

Of course no amateur would expect to hear or use h.f. signals from a mile high and 100-200 miles away. The cone of silence and skip effect would prevent. Sunrise and sunset effects also would have been detrimental that Friday morning (5-8.45 a.m.) when the last frantic attempts to seek bearings were made. Both transmitter and receiver all set for 500 kc.! The only thing lacking, the discarded aerial and operating knowledge. Ships, the best source of information and aid over great stretches of water, yet no 500 kc. Use of the discarded 250 ft. of wire and an entirely different story might easily have been written!

If there is any lesson from all this, it seems to us that it is that such expeditions should be required to include a person with both adequate code knowledge and apparatus technique in every such case. How one of our A.R.R.L. Field Day groups could serve, if given the makings of a transmitter and even a 2-hour battery supply and chance to put it up on a coral isle for the fliers! Time may throw more light on the KHAQQ mysteries, but the above technical points help us amateurs to understand.

MICA

Mica is usually described as a rock-forming mineral, or rather a group of minerals including Muscovite, Paragonite, Biotite, Phlogopite, Lepidolite, etc., with perfect cleavage in one direction, the laminae flexible and elastic, and generally transparent. Its chemical composition is of alkalis such as potassium or sodium and aluminium silicate, and it is mined extensively in India, the United States and Canada. Muscovite and Phlogopite are practically the only species used commercially and it is the latter which is almost exclusively used for electrical purposes.

Its great dielectric strength and resistance to changes of heat commend it for a myriad of uses, and a special virtue for many branches of radio work is its high dielectric constant. A dielectric is of course a medium through which electrical forces act without conducting the actual current, such as air, which incidentally is taken as the unit, compared with which the dielectric constant of mica is six. The constants of other usual dielectrics are, waxed paper 2, paraffin wax 2, ebonite 2.75 and shellac 3.

Perhaps you have split pieces of mica into thin layers—it is easy enough for unskilled hands to get many thin, perfect sheets—but mica cutters with a special tool are able to split it several times after you have reached your limit.

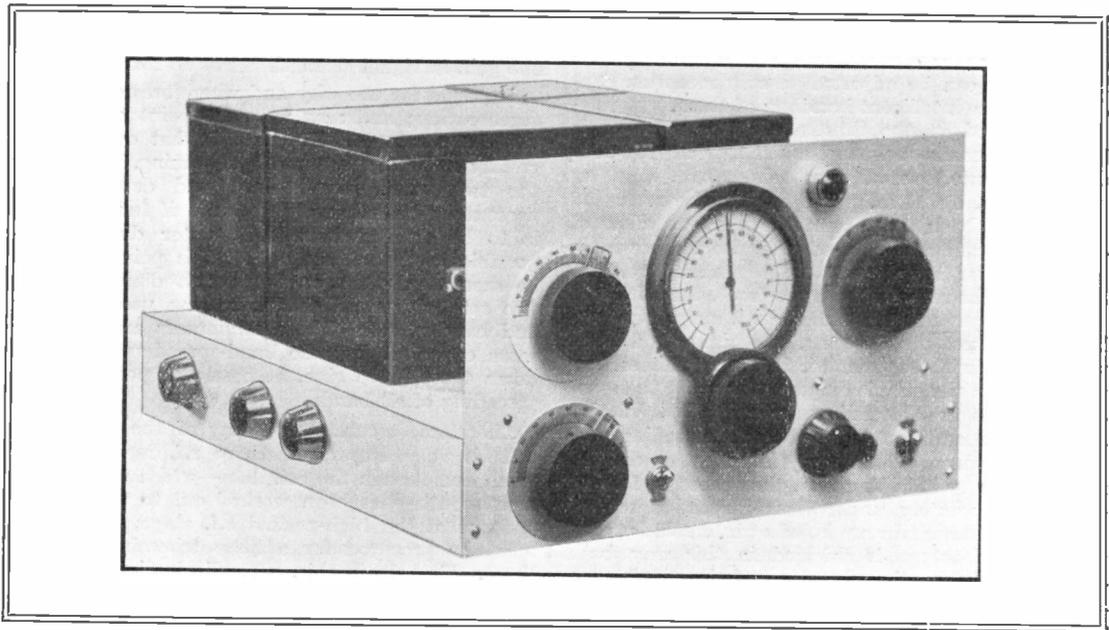
Mica splittings held together with an adhesive, usually shellac, is known as micanite. After being thus built-up it is pressed in steam-heated presses and shaped as it is then soft and fairly pliable, when cool it regains its rigidity. Such micanite would have about 20 per cent, adhesive content, but the hard micanite used in commutators, etc., often contains less than a quarter of that amount. The dielectric strength of micanite is 40,000 volts per millimetre, compared with ebonite 30,000, with porcelain and glass merely 10,000 and 8,000 volts per millimetre respectively.

THE S-W.M.

“Ideal” Straight Receiver

READERS' IDEAS PRODUCE AN OUTSTANDING AMATEUR BANDS SET

Engineered by **AUSTIN FORSYTH (G6FO)**, “S.-W.M.” Technician,
in collaboration with **BASIL WARDMAN (G5GQ)**, Editor.



● Introduction

THE RECEIVER PRESENTED in the following pages touches what we believe to be the ultimate in straight circuit design with battery operation. As most readers of THE SHORT-WAVE MAGAZINE know—particularly those who have taken an interest in this set by offering their suggestions—there are two schools of thought on the question Straight v. Superhet. There is much to be said for and against both, and it is safe to say that not only will the straight circuit find favour for a long time to come, but also that many of its possibilities have not been fully realised or explored. Too many amateur-band receivers have been offered which are merely trimmed-down broadcast sets, and commercial

superhets, claimed to be in the “amateur communication” class, are not always satisfactory.

With these and many other points in mind, we have aimed at producing a design, as regards both circuit and mechanical features, which will do full justice to all the possibilities of the straight receiver—everything, in fact, covered by the single word “performance”—and which is at the same time a sound and workmanlike job to be relied upon for consistent results. Nothing has been sacrificed on the grounds of either economy or appearance, but as the specification and photograph show, the set is neither an extravagant luxury nor can it fail to adorn any amateur station. That’s how we feel, at any rate!

● General Design and Main Features

The circuit is based on the TRF-Det-LF arrangement, which is simple enough, though first glances at the photograph and diagram does disclose such an array of knobs. However, it is only by having every possible variable under control that the utmost in performance can be obtained, and it can safely be said that every dial and switch is fully justified and that actually under ordinary operating conditions, the receiver is single-control. The point of this is that the various controls have optimum settings which, when found for the different bands, need only be touched to alter, say, the sensitivity, the audio output, or the degree of r.f. regeneration. It is not till one has handled such a receiver that the shortcomings of the ordinary set with only two knobs, one for tune and the other for reaction, are fully realised. It is indeed a great thing to have everything under control, and it is surprising how the receiver can be adjusted to suit reception conditions by the intelligent handling of them.

As pictured in the illustration, the receiver is built on a chassis-and-panel assembly carrying four screening boxes, over-all sizes being 13 in. wide, by 16½ in. deep, by 8½ in. panel height; the screening boxes stand back 5 in. from the panel to allow of extension controls being used and also to give room for the power supply unit in the mains version. Looking at the receiver from the front, the left-hand forward compartment houses the r.f. stage, the left-hand back box the detector, the right-hand back the l.f. end, with the monitor in the right-hand forward box. In the circuit diagram (page 30) the associated valves are lettered respectively V1, V2, V3 and V4. In addition to the visible screening, the sub-chassis space, which is 2½ in. deep, is divided into sections by shielding ribs, the spaces so formed coming immediately under their respective screening boxes. These ribs are holed at intervals for easy wiring. Each stage is shielded in this way both above and below the chassis, and is wired as a separate unit; thus, construction is simplified and r.f. leads kept short, which helps to improve performance.

Main controls are, of course, on the front panel, what might be called the minor variables being carried on the sub-panels along the two sides and within easy reach of the operating position. The necessary terminals, battery connector and speaker outlet are at the back.

Messrs. Evrizon Radio, 2, Southlands Road, Bromley, Kent, supply the complete chassis ready-drilled and with all fixing screws.

● The Circuit

The first point to notice in the circuit diagram is that regeneration is provided for in the r.f. stage. This question of peaking signals at the h.f. end of the line-up is undoubtedly a matter for thought and discussion, and it can be said here

and now that those who do not want to be bothered with this extra control can leave out the regeneration circuit. Those who do so will probably think—and we agree—that if the design and lay-out are such that full use is made of the amplifying properties of the r.f. valve, regeneration should not be required. On the other hand, it must be remembered that as the frequency increases to 14 and, particularly, 28 mc., the input capacity of the very best of valves begins to act more and more as an r.f. by-pass, so that if a certain amount of regeneration can be introduced at these frequencies, there will be a gain in both signal strength and selectivity. The regeneration control is, of course, operated just below the point of oscillation, and from the foregoing remarks, it will be understood that it is on the higher frequencies that the effect of regeneration will be most apparent—and that is just where it is wanted. On 1.7 mc., while selectivity is improved, the gain in signal strength is not so marked.

So much for the why and whereof of using r.f. regeneration; and now we must point out some of the disadvantages. The first is that owing to the greatly increased sharpness of tuning, tracking of the two tuned circuits—r.f. and detector—must necessarily be extremely accurate if full advantage is to be derived from the greater discrimination possible in the r.f. stage. At this point, it should be mentioned that, as the circuit diagram shows, two sets of ganged condensers are used—band-set and band-spread. These condensers are all of the same capacity, but the band-spreaders are tapped down the coils to give, as nearly as possible, equal spreading of all bands.

Therefore, accurate matching of the two sets of coils is very important where r.f. regeneration is used, and though the coil data—which will be given next month—has been worked out to take full advantage of the high-peaked r.f. stage, constructors must be prepared for a little trimming here and there. To help in this, a small air di-electric trimming condenser, shown in the circuit diagram, is connected across the band-setter in the r.f. stage, and this requires adjustment for each set of coils.

The next difficulty as regards using regeneration on the r.f. side is—with battery valves—the circuit to employ. The cathode tap arrangement gives the best results and is most easily controllable, but a little consideration will show that with 7-pin coil forms, an 8th pin is required to accommodate the usual double-winding, six being needed for the other connections. Even if 8- or 9-pin formers were available, such a multiplicity of leads inside the coil would be difficult to manage on the higher frequencies, and would probably defeat its own object. Accordingly, a double-wound r.f. choke, FC1 in the circuit diagram—which is easily home-made—has been designed for the purpose and is inserted in the filament leads. In order to get bias on the grid of the valve, blocking condensers C3 and C4 must be

used. R1 is the bias control resistor, which serves as the r.f. gain adjustment, regeneration control being effected by means of the potentiometer R2.

Coming now to the detector circuit, it will be seen that a three-winding coil assembly L3, L4, L5 is used, L3 being the primary winding, L4 the grid tuning inductance and L5 the reaction winding. Here another point arises. Since the cathode tap method of obtaining regeneration is used in two parts of the circuit, it will probably be asked why it is not also incorporated in the detector stage. The answer is because *best results in the detector are achieved by using a screen-grid valve with a combination of condenser- and resistor-controlled reaction*. Apart from this, there is again the difficulty of the number of pins required, and actually there is no other way of getting reaction in this particular circuit. The control resistor R6, which varies the screen-grid voltage, is only used for setting the valve in its most sensitive condition, C11 being the reaction condenser, always used under operating conditions. The result is absolutely smooth and noiseless control.

The detector stage is coupled to the output valve V4 by means of a parallel-fed transformer, with a high-impedance choke Ch. in the plate lead. The purpose of the two r.f. chokes RFC is to provide, as nearly as possible, a uniform r.f. impedance over the whole tuning range 9. to 200 metres. They are two of different type, a 10-metre choke in series with the usual short-wave one, so that satisfactory operation on the high frequencies at 28 mc. is assured.

● Monitor—Beat Oscillator Unit

Some preliminary details of this were given in the first notes on the receiver, which appeared in the last issue, so that readers were no doubt prepared for it and have already made up their minds whether or not they will incorporate it. It is a unique feature of this set, since no other published design, and very few of the commercial types, offer a circuit which allows both phone and c.w. monitoring as well as a beat-oscillator which can be used also as a calibrated frequency meter. Note, however, that the calibration accuracy obtainable is not high enough for anything but rough checking, as providing full band-spread and a high degree of accuracy in this circuit would involve unnecessary and unjustifiable complication, while its operation as a phone monitor would either have to be dropped altogether or further compensation arranged to maintain accuracy.

The monitor valve V3 functions as an electron-coupled oscillator, the same cathode tap arrangement being used as in the case of V1. The reason for the choice of this circuit is that good frequency-stability is required for c.w. monitoring and also when it is used as a beat-oscillator on the higher frequencies; any calibration is likewise more certain with an inherently stable arrangement of this type.

Dealing with the functions and operations of the monitor-beat oscillator unit in turn, there is first its use as a monitor. Every amateur should have a constant check on his output on either c.w. or phone, and the switching connections of the listening circuit should tie in with the main change-over. All this has been arranged for in the receiver by means of the d.p.d.t. switch S1. In the right-hand position M, the plate of the monitor valve takes its h.t. through the choke Ch., the audio output being fed into the coupling transformer T1. The same switching motion disconnects the l.t. from the first two valves V1 and V2 and lights the filament of V3; V4 is of course on all the time the receiver is running, since audio amplification is required on both "monitor" and "receive" positions. The change-over is the same for either c.w. or phone monitoring, and V3 is normally in an oscillating condition to heterodyne the transmitter signal. In order to check the telephony output, V3 is put out of oscillation by means of the screen-grid control resistor R12, rectification taking place by means of the leak-condenser combination C17-R13. Pick-up from the transmitter is obtained with a short wire attached to the grid end of V3 through a small fixed condenser C20, a separate "aerial" terminal being provided on the back sub-panel for the purpose.

The advantages of coupling the monitor output into the l.f. stage may be briefly summarised: First, adequate amplification is available, which means that the monitor does not have to be overloaded in order to give a good signal in the phones or speaker; secondly, the annoyance of changing over, or providing extra switching for, the phones from l.f. stage to monitor plate circuit is avoided; thirdly, any calibration on the monitor dial is not affected by load variations, though this is a less important point with an electron-coupled circuit than it would be otherwise.

It can thus be seen that S1 is a "receive-stand by" switch which, in the left-hand position R, brings the receiver on to the station being worked, and in the right-hand setting M, produces the transmitter signal in the phones or speaker with the r.f.-detector end of the receiver dead.

The full value of this can only be realised by experiencing its operation, and it is safe to say that any transmitting amateur who has not previously had a means of monitoring continuously—and there are too many who do not—will never go back to the state where no such check is so easily available.

S2 is the beat oscillator switch and, as can be seen from the circuit, it applies h.t. and l.t. to V3 when S1 is set for reception. If S2 is made with S1 in position M, for monitoring, no damage will be done but the audio output from the monitor will be bypassed almost entirely, and only a very weak signal heard from the transmitter.

With regard to the use of V3 as a beat-oscillator, it is again a feature which must be tried before its

value becomes apparent. When receiving c.w. through heavy interference, improved discrimination is possible in the detector circuit by applying the beat-oscillator, this being done simply by closing S2 and then adjusting the tuning dial of V3, with the detector reaction just below oscillation point. The beat-oscillator then heterodynes the incoming signal, the pitch of which can be varied without upsetting the tune. Thus, a c.w. signal can be picked out of very bad interference, with a marked gain in apparent selectivity. The beat frequency is fed into the detector grid by means of the shielded lead, the other end of which is coupled to the anode pin of V3. This lead is a piece of insulated wire wrapped round the grid and anode pins of V2 and V3, and does not affect the operation of either stage in any other way. A further point to note is that the *intensity* of oscillation applied to V2 by V3 can be varied to a certain extent by R12, though the effect will not be very marked on weak signals. This is a matter which will be discussed further next month, when fuller details of construction, adjustment and operation will be given.

The fourth application of the monitor-beat oscillator is in connection with its function as a calibrated frequency meter. Now, too much should not be expected here, since the tuning circuit of the oscillator, while being stable, is not sufficiently spread to get accurate readings on the h.f. bands. Quite a good degree of calibration accuracy is, however, possible on 1.7 mc., and to a lesser degree, on 3.5 mc. The main value of the monitor when used as a calibration standard will be to check the adjustment of the band-setter, i.e., the limits of the various bands, while in the case of transmitters using master-oscillator or e.c.o. drive circuits, it is possible to get the transmitter frequency just where it is wanted in relation to the station being worked or the interference conditions. This can be done very accurately—near enough to heterodyne the transmission from another station, which most people will agree is quite sufficient!

It may be asked why a full set of coils is also needed in the monitor circuit—in other words, why should it not be operated on the harmonic principle. The answer is that for effective telephony checking, listening should be carried out on the fundamental, and not on an harmonic. Apart from this, one or perhaps two coils will be enough to cover all bands for c.w. monitoring and beat-oscillator operation.

Therefore, it will be at once apparent that a great deal of flexibility is possible in the monitor circuit. It can be left out altogether, to start with! If V3 is not built in, switches S1 and S2 are not required, and the chokes RFC in the plate of V2 are taken straight to the iron-core choke Ch. Again, if transmission takes place on only one band, say 7 mc., only the monitor coil for that band is required—assuming that listening is also chiefly on 7 mc., though with the coil at L6 for this frequency-range, strong harmonics are available for c.w. monitoring

or beat-oscillator operation on 14 and 28 mc., with rather weaker “overtones” on 3.5 mc. Similarly, supposing phone working is carried out on 1.7 mc., a coil for this band at L6 would enable telephony checking to be done on that band, and c.w. monitoring and beat-oscillator operation on all others down to 14 mc., though at this frequency the output would probably be low.

Hence, it is evident that in the monitor circuit, only those coils need be used that are necessary to cover the bands on which transmission and, of course, reception take place. The same applies to the coils in the other stages, though for completeness the up-to-date station should be capable of receiving on all bands, even if transmission is not possible on one or other of them.

Before leaving the monitor-beat oscillator unit, there is one further query which may be raised: The question of ganging the circuit C18-L6 with the other tuned circuits. The most obvious objection is, of course, that under such conditions monitoring would be most inconvenient, as the main tuning dial would have to be changed to the transmitter frequency when S1 was in the “monitor” position, so that on going back to “receive,” the other station would have to be re-tuned each time. This is as bad as listening to one’s own transmission on a harmonic of the receiver! Apart from this, it is doubtful if the beat-oscillator would be wanted often enough to justify ganging it with the main control, with all the ensuing complications. Under normal conditions—not perhaps on 7 mc!—the receiver tuning would be left set to the station being worked, with the monitor dial likewise on the transmitter frequency. Changing over is then simply a matter of operating S1. The purpose of the resistor R10 may not be clear at the first glance; it is to keep the voltage on V3 the same whether this circuit is being worked as monitor or beat-oscillator, and is thus made approximately equal to the d.c. resistance of Ch.

● The Output Stage

As will be seen the final stage follows standard practice, except that jacks are provided for both high-resistance phones and a moving-coil speaker. The latter is matched to the valve by means of a multi-ratio transformer T2, the primary side of which also acts as the coupling choke for headphone working. The volume control is at R8, R9 being the usual grid-stopper. As has been mentioned, the l.t. wiring is so arranged that V4 is on continuously while the receiver is running.

Switch S3-S4 is the d.p.s.t. on-off control, breaking both h.t. and l.t. circuits.

● Arrangement of Controls

Having thus run through the circuit, the various controls can be related to the photograph. The main tuner is the band-spreader, with condensers C2 and C8 in gang, driven by an Eddystone Full-Vision dial mounted centrally on the panel. To the left of

it is the band-setter, with condensers C1 and C9 in gang, to which is fitted a slow-motion driving head, also of Eddystone manufacture, enabling this line of condensers to be accurately adjusted when changing from band to band. On the right of the main control is the monitor-beat oscillator tuner, similar to the band-setter. Below the latter is the detector reaction dial, again fitted with slow motion and a long extension control—the reaction condenser is in the sub-space—which brings C11 right up to its associated coil. The first switch on the left is S2, bringing in the beat oscillator, the knob which follows on the bottom line is R12, monitor regeneration adjustment, with the phone jack and S1, the stand-by switch, immediately following. The dial light is also on the front panel.

Along the side sub-panel visible in the photograph are the r.f. regeneration, r.f. bias and detector reaction resistor controls, respectively R2, R1 and R6 in the circuit diagram. On the corresponding sub-panel on the other side are mounted the volume control R8 and on-off switch S3-S4, with terminals for aerial and earth, battery inlet and speaker jack at the back.

The general lay-out will be apparent from the photograph, though there are one or two points which need attention. These will be discussed next month in connection with the construction.

● Choice of Components

This, quite the most important consideration owing to the fact that any design depends on reliable components being generally available, has been given much thought and attention and, we might almost say, has even occasioned sleepless nights! Everything has been carefully selected and it is therefore very essential that the same parts be used for building the receiver. The necessary components are fully specified in the parts list and table of values and, to make ordering easier, this list is drawn up stage-by-stage.

In any battery receiver, particularly such a one as this, valves are of supreme importance, and Hivac are specified as they have been found eminently suitable for short-wave working, being stable and easily controlled on frequencies well above 28 mc. This is due to their construction, the short-wave range having the grid brought out to the top cap, a ceramic base being also fitted. Three SG220SW are used for V1, V2 and V3, with a Hivac Z220 output valve at V4. This latter is also unusual in that it is of multi-grid construction with "critical anode spacing," and it is therefore unusually sensitive.

The variable condensers, six in number and of .0001 mfd. capacity each, are all of Eddystone manufacture, chosen because their tolerance is close enough to permit of satisfactory ganging, a most important point. Mechanical items such as extension controls, flexible couplers and slow-motion drives are by the same makers. Their Full Vision

dial gives smooth and positive movement with two condensers in gang, and the pointer moves against a clearly divided scale. An interesting feature of this dial is that owing to high reduction ratio, 100:1 in the slow speed control, a flywheel effect is obtained when operating the 8:1 knob. Thus, the band can be quite rapidly searched, and with band-spread, the latter reduction ratio is ample for ordinary purposes.

Valve-holders are Clix chassis mounting type, and are again important components. The coil forms specified are Raymart, as these not only have the requisite number of pins, but being moulded of special low-loss material, give high efficiency. A small point worth noting in connection with them is that each former is provided with an "identification disc," so that it is a simple matter to find the right ones when changing bands in a hurry.

A Varley transformer is used at T1, with a Bulgin high-inductance coupling choke at Ch. The output

IDEAL RECEIVER BLUE PRINTS

Full particulars will appear in the
October issue

transformer T2 is an Epoch (Radio Development Co.) multi-ratio, who can also supply such items as condensers and resistances. A number of small parts from the excellent—and unique—Bulgin range are a contributory factor to the easy construction of this receiver; nuts, bolts and washers, insulating collars, switches, dial light and so on.

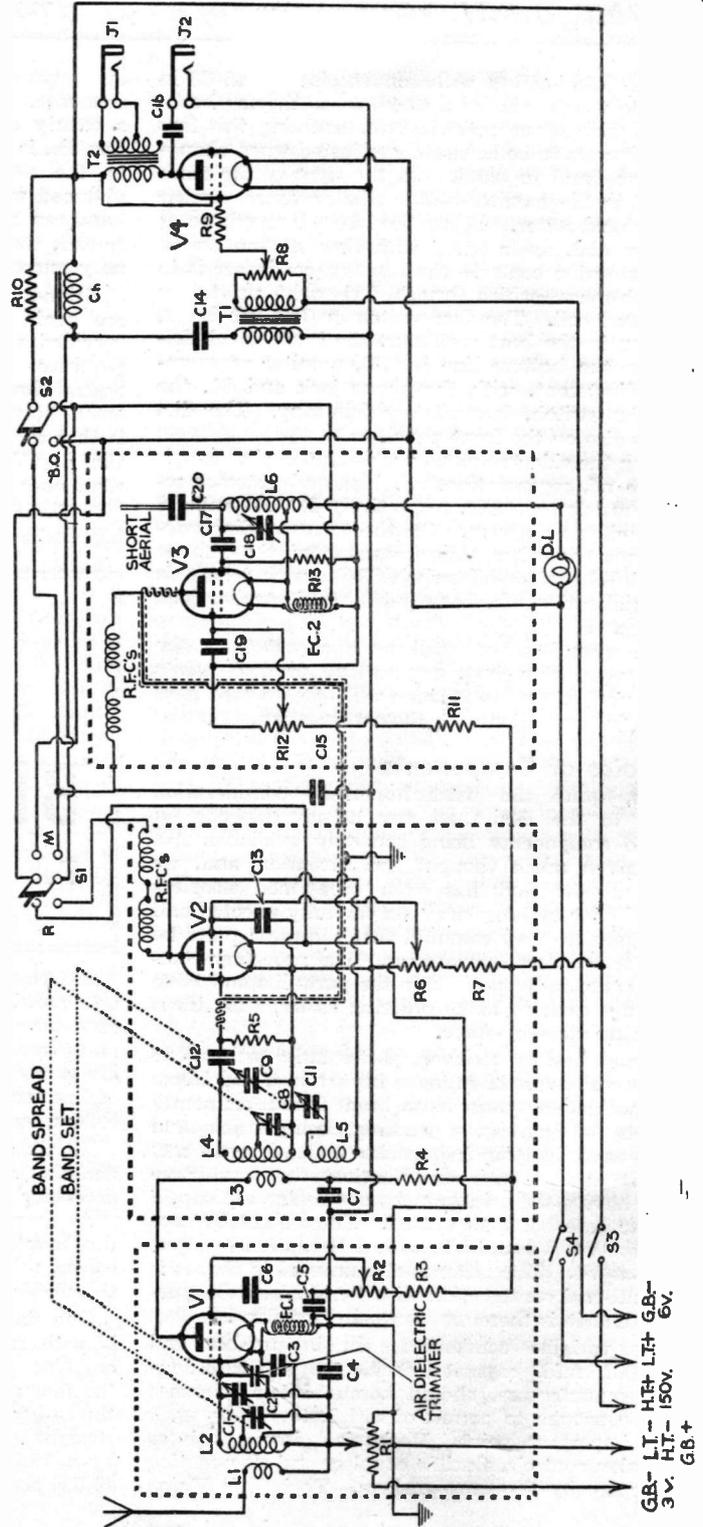
All fixed resistors are Erie, and the fixed condensers are Dubilier. These, and the other necessary parts, are all fully specified in the lists.

As space considerations make it impossible to deal this month with the actual construction of the receiver, this must be left till the October issue, when the under-chassis views will be shown.

One final point before we close this first article is with regard to the modifications necessary for omitting the r.f. regeneration. Condenser C3 and the filament chokes FC1 are not needed, neither is the cathode tap. One leg of the filament is brought straight to the earthed side of C4 and R2 is replaced by a 50,000 ohm fixed resistor and R3 by one of 40,000 ohms.

Circuit of the Complete Receiver and List of Parts

This diagram should be carefully studied in conjunction with the text before any construction is commenced. Note particularly the regeneration arrangement in the r.f. stage V1, and the switching of the monitor-beat oscillator unit.



LIST OF PARTS, STAGE BY STAGE

R.F. STAGE :

- V1—Hivac SG220SW.
 C1, C2—.0001 mfd., Eddystone 900/100.
 C3—.002 mfd., Dubilier 690W.
 C4, C5, C6—.01 mfd., Dubilier 4421/E.
 R1—500 ohm potentiometer, linear, Reliance.
 R2—50,000 ohm potentiometer, linear, Reliance.
 R3—30,000 ohm 1-watt, Erie.
 One 15 mmfd. trimmer, Raymart VC15X.
 Four 7-pin coil formers, Raymart CT7, threaded.
 One 7-pin coil former, Raymart CT7, plain.
 One 7-pin valveholder, Clix chassis mounting, with terminals.
 One 4-pin valveholder, Clix chassis mounting, with terminals.
 Two Sets Extension Controls, Eddystone 1008.
 One S-M Driving Head, with knob and dial, Eddystone 1036.
 Two Adjustable insulating brackets, Eddystone 1007.
 Two Flexible Couplers, Eddystone 1009.

DETECTOR STAGE :

- V2—Hivac SG220SW.
 C8, C9, C11—.0001 mfd., Eddystone 900/100.
 C12—.0001 mfd., Dubilier 690W.
 C7, C13—.01 mfd., Dubilier 4421/E.
 R4—10,000 ohm 1-watt, Erie.
 R5—3 megohms, Erie.
 R6—3 megohms, Erie.
 R7—30,000 ohm 1-watt, Erie.
 RFC—Two RF chokes, Q.C.C. Type A and B.
 Four 7-pin coil formers, Raymart CT7, threaded.
 One 7-pin coil former, Raymart CF7, plain.
 One 7-pin valveholder, Clix chassis mounting, with terminals.
 One 4-pin valveholder, Clix chassis mounting, with terminals.
 One midjet stand-off insulator, Eddystone 1019.
 One Full-Vision dial, Eddystone 1070.
 Three Flexible Couplers, Eddystone 1009.
 One Extension control, Eddystone 1008.
 One S-M Driving head, with knob and dial, Eddystone, 1036.

MONITOR STAGE :

- V3—Hivac SG220SW.
 C17—.0001 mfd. Dubilier 690W.
 C18—.0001 mfd., Eddystone 900/100.
 C15, C19—.01 mfd., Dubilier 4421/E.

- C20—50 mmfd., J.B. pre-set.
 R10—2,000 ohm 1-watt, Erie.
 R11—30,000 ohm 1-watt, Erie.
 R12—50,000 ohm potentiometer, linear, Reliance.
 R13—50,000 ohm 1-watt, Erie.
 RFC—Two RF chokes, Q.C.C. Type A and B.
 Four 4-pin coil formers, Raymart CT4, threaded.
 One 4-pin coil former, Raymart CF4, plain.
 Two 4-pin valveholders, Clix chassis mounting, with terminals.
 One midjet stand-off insulator, Eddystone 1019.
 One Extension Control, Eddystone 1008.
 One Flexible Coupler, Eddystone 1009.
 One Adjustable insulating bracket, Eddystone 1007.
 One S-M Driving Head, with knob and dial, Eddystone 1036.
 One DPDT Switch, Bulgin S.98. (S1).
 One DPST Switch, Bulgin S.123. (S2).

OUTPUT STAGE :

- V4—Hivac Z.220.
 Ch.—High-impedance coupling choke, Bulgin L.F.34.S.
 T1—5:1 coupling transformer, Varley DP.22.
 T2—Multi-ratio output transformer, Epoch 1086.
 C14—.01 mfd., Dubilier 4421/E.
 C16—2 mfd., Dubilier BB.
 R8—1 meg. volume control, taper, Reliance.
 R9—50,000 ohm 1-watt, Erie.
 J1, J2—Close-circuit jacks, Webbs, with plugs to match.
 One 5-pin valveholder, Clix chassis mounting, with terminals.
 One DPST Switch, Bulgin S.123. (S3-S4).
 One Dial Light, Bulgin D.9.
 One Cable Plug, Bulgin P.72, 7-way.
 One 7-way Battery Cord, Bulgin.
 One 7-pin chassis-mounting valveholder, Eddystone 985.

MISCELLANEOUS ITEMS :

- 3 Terminals, Clix Type B, one black, two red.
 Bulgin Accessories:
 1lb. No. 24 enamelled wire; 3 ft. coil screened wire; 2 coils Quikwyre, red, 2 coils Quikwyre, black; 4 packets bushing washers; 2 doz. r'h 6 BA screws, 1/4-in., 3 doz. r'h 6 BA screws, 1/2-in., 1 doz. r'h 6 BA screws, 1 in.; 3 doz. 6 BA half-nuts, 3 doz. 6 BA full nuts; 2 doz. rubber grommets; 2 doz. 6 BA washers.

Listeners' DX Corner

By A STRANGE coincidence the same mail brought a report from India and a letter from W. E. Davey wishing that some of the overseas readers would write.

● A Report from India

The report comes from P. A. Foard, Agra, India. He says: "I've been a radio enthusiast since I was thirteen, but paid hardly any attention to short waves until I came out here in 1933, and then of course their value was brought home to me."

He has only sent for verifications to broadcasters, because he thought that amateurs wouldn't be interested, but after reading the reports of others in THE SHORT-WAVE MAGAZINE he has decided to start sending amateurs reports.

Mr. Foard has received 58 veries, the best reception so far being: LRX, 11,000 miles; HJ1ABP, 11,000 miles; YV5RC, 11,000 miles; W8XAL, 12,000 miles; SM5SX, 5,500 miles; and OXY, 5,500 miles.

● Sackcloth !

Lynx-eyed correspondents have descended upon me heavily for asking about VV1AA last month, telling me that if I were a genuine amateur instead of a hack journalist I should have known there was no such prefix as "VV," only "YV."

This poor scribe, duly prostrating himself before superior knowledge; would like to whisper that "VV" was once used unofficially, though he cannot remember who by. Some of the rarer places, especially islands, still use unofficial prefixes. A card from Ascension Island uses the call "VQ8A," an unofficial prefix, "VQ8" being Mauritius. Later cards bear the correct call "ZD8A." "VP3" did not always prove location in British Guiana, at one time it was "pirated" by Malta, now "ZB."

● Some Hints

W. E. Davey (Belfast) thanks Bob Everard for his congratulations on Japanese reception, and says he wishes he could acquire the consistency that Bob does. VE5 is the rare one in Belfast, and W.E.D. says that if he put chains round a VE5 and tried to pull it through the receiver he doesn't believe it would come out. "I really can't understand why I don't pull in VE5," continuing—"the other day I heard W7, four of them, but no VE5, and conditions were good."

Well, VE5 doesn't always come in with W7. It comes in between K6, VK, and W6. There are three sets of conditions for these, W6, W7 (and occasionally W5) coming through together, then VK. If things are exceptionally good with W6 and 7, and W5 together, and finally VE5 and K6 together. i.e., a couple of hundred of them to be heard, then VE5 comes through. The point is that usually you get W6 and 7 coming in well for a morning or so, and then conditions switch over to VK-W5. On rare occasions the formation does not change so completely and so instead of an immediate switch-over VE5, K6 and K7 come through without any of the others. Of course in the mornings signals

come the long way round. Another time for VE5 is around midnight. This group reception is remarkably interesting, and after a little study it is possible by hearing one station to forecast what stations are likely to be heard.

Last March was an interesting example of W6 conditions. They came in from 7 to 8 a.m., again at 3.40 p.m. till 4.25 (almost to the minute), and twice more at 7.30 p.m. and midnight!

When local stations are strong on 14 mc. and no dx coming in conditions are really bad. But when no locals or dx are to be heard then is the time for South Africa.

● Three Logs

However, to return to business, W. E. Davey has logged recently: KAIME, W6OY, 6JKR, 6GUJ, K6OQE, W7AFP, W7ABH, W7FQK, W7APD, on 14 mc., while on 7 mc. he has brought in YV5AC, LU8AB and HI6O, since August 8. Pretty hot, especially the 7 mc. crowd.

On the subject of Colorado he has a veri. from W9UJS, on 14 mc. phone. Power, 300 watts.

Now for Bob Everard. His log is again the star.

July 15 to August 16. 14 mc., all phone: W5 EEN, DEW, ZS, EPW, ZA, APE, GIB, FDI, YJ, CYC, EAM, EWW, FHY, YF, CMS, AHK, BEE, FIY, BLW, DUK, BEK, DQ, YW, EBP, FJP, DAN, BCU, DVM, AKZ, FDD, EYW, EDW, EOJ, WX, AHJ, FPO, BJO, DNV, FNA, FEQ.

W6 LR, MR, CQG, CLS, EFC, FUO (Nevada), LLN, LEE, OCH, OAJ, OCX, MDX, BAW, GAL, DDA, JP, MWO, EQJ, FKK, BQY, JKR, EJC, BGH, SJ, IRX, ISH, LAJ, NNR, FQY, FGU, DWE, MLG, AL, AH, EIP, IXZ, IDV, LYP, HAA, NLP, DL, AMG, CDQ, AVD, LFU, CNA, OHL, ATQ, ARY, CC, HJU, ITH, BPM, BJB, CUU, LKQ, GCT, HOW, LLQ, YU, MWD, NTX, BKY.

W7 DNB, DNP, FEV, FDQ, CAM, AEM, FQK, CEO, EKA, EGV, APD, AMQ, BL, ESK.

K6 NZQ, KMB, KPV, BAZ, CMC, OQE.

18 VK's, 22 VE4's, 15 VE5's (OT, PE, UW, EF, BF, JK, JB, OO, HI, AM, MQ, PJ, NY, FO, TV).

7 mc. Phone. TI1AF, 2OFR, 2AV, CO2RA, VO1P, YV5AX, HK1MV, YV1AH, HC1FG, LU1EB, LU7KA.

3.5 Phone. W 1SZ, 3FHU, 1BES, 2AU, 8JOE, 2BDI, 3BMS, 4LU, VE1EI.

The last log there is space for comes from 2AAN, Tankerton, Kent. This includes: ZL2OQ, 1DY, VK2YW, 2XU, 2XN, 2VV, 2AP, 2ABG, 2AFM, 2NY, 2FX, 3KX, 3XD, 3BWA, 3PL, 3ZC, 3QR, 3VF, 3BG, 3GU, 3LA, 3BK, 4RV, 4KO, 5AW, 5JB, 5HM, 5FM, 5TR, 5LL, 2PZ, 3PE, HP1A, HP1MJ, HP1HA, VS1DB, VS1BJ, VS7JW, ZU1AH, VQ4CRU, PK1MX.

He uses a battery o-v-1, with a 7 mc. doublet on 14 mc. If the aerial were cut in half signals on 14 mc. would probably come up two R points.

Next month I shall offer a suggestion that will further enhance the popularity of our "Corner," until then, 73.

QUERY COUPON

S.-W.M.

9/37

BROADCAST STATIONS

Station	Call	Wave	Freq.	Station	Call	Wave	Freq.
PITTSBURGH	W8XK	13.93	21.54	EINDHOVEN	PCJ	31.28	9.50
DAVENTRY	GSJ	13.93	21.53	LYNDHURST	VK3LR	31.32	9.58
WAYNE	W2XE	13.94	21.52	MILLIS	W1XK	31.35	9.57
DAVENTRY	GSH	13.97	21.47	ZEESSEN	DJA	31.38	9.56
BANGKOK	HS8PJ	15.77	19.02	PODEBRADY	OLR3A	31.41	9.55
BANDOENG	PLE	15.93	18.83	ZEESSEN	DJN	31.45	9.54
DAVENTRY	GSG	16.86	17.79	JELOY	LKJ1	31.48	9.53
BOUNDBROOK	W3XAL	16.87	17.78	TOKIO	JZI	31.48	9.53
HUIZEN	PHI	16.88	17.77	SCHENECTADY	W2XAF	31.48	9.53
ZEESSEN	DJE	16.89	17.76	HONG KONG	ZBW3	31.49	9.52
WAYNE	W2XE	16.89	17.76	MELBOURNE	VK3ME	31.55	9.51
BUDAPEST	HAS3	19.52	15.37	DAVENTRY	GSB	31.55	9.51
ZEESSEN	DJT	19.53	15.36	CARTAGENA	HJ1ABE	31.58	9.50
ZEESSEN	DJR	19.56	15.34	RIO DE JANEIRO	PRF5	31.58	9.50
SCHENECTADY	W2XAD	19.57	15.33	MEXICO CITY	XEWV	31.58	9.50
DAVENTRY	GSP	19.60	15.31	MADRID	EAR	31.62	9.49
BUENOS AIRES	LRU	19.62	15.29	HAVANA	COCH	31.82	9.43
ZEESSEN	DJQ	19.63	15.28	BANGKOK	HS8PJ	31.85	9.35
WAYNE	W2XE	19.65	15.27	LIMA	OAX4I	32.12	9.34
DAVENTRY	GSI	19.66	15.26	BUDAPEST	HAT4	32.88	9.12
RADIO COLONIAL (Paris)	TPA2	19.68	15.24	RADIO NATIONS	HBP	38.48	7.80
PODEBRADY	OLR5A	19.71	15.23	TOKIO	JVP	39.95	7.51
EINDHOVEN	PCJ	19.71	15.22	SAN DOMINGO	HIT	45.25	6.63
PITTSBURGH	W8XK	19.72	15.21	NANKING	XGOX	43.99	6.82
ZEESSEN	DJB	19.74	15.20	VALENCIA	YV4RB	46.01	6.52
HONG KONG	ZBW4	19.75	15.19	MARACAIBO	YV5RP	47.84	6.27
DAVENTRY	GSO	19.76	15.18	HAVANA	COKG	48.39	6.20
TOKIO	JZK	19.80	15.16	MARACAIBO	YV5RD	48.78	6.16
SOURABAYA	YDC	19.80	15.15	WINNIPEG	CJRO	48.78	6.15
DAVENTRY	GSF	19.82	15.14	PITTSBURGH	W8XK	48.86	6.14
VATICAN CITY	HVJ	19.84	15.12	JELOY	LKJ1	48.94	6.13
ZEESSEN	DJL	19.85	15.11	HAVANA (CUBA)	COCB	48.94	6.13
SOFIA	LZA	20.24	14.88	GEORGETOWN	VP3BG	48.94	6.13
WARSAW	SPW	22.00	13.63	BOGOTA	HJ3ABX	48.96	6.13
REYKJAVIK	TFJ	24.52	12.23	MEXICO CITY	XEUZ	49.02	6.12
MOSCOW	RV59	25.00	12.00	WAYNE	W2XE	49.02	6.12
RADIO COLONIAL (Paris)	TPA3	25.23	11.88	CHICAGO	W9XF	49.18	6.10
PITTSBURGH	W8XK	25.27	11.87	BOUNDBROOK	W3XAL	49.18	6.10
PODEBRADY	OLR4A	25.34	11.84	BELGRADE	YUA	49.18	6.10
WAYNE	W2XE	25.36	11.83	LIMA	OAX4Z	49.24	6.09
LISBON	CT1AA	25.36	11.83	HONG KONG	ZBW2	49.26	6.09
ROME	2RO	25.40	11.81	NAIROBI	VQ7LO	49.32	6.08
TOKIO	JZJ	25.42	11.80	CHICAGO	W9XAA	49.34	6.08
VIENNA	OER2	25.42	11.80	MARACAIBO	YV1RD	49.42	6.07
BOSTON	W1XAL	25.45	11.79	PHILADELPHIA	W3XAU	49.50	6.06
ZEESSEN	DJD	25.49	11.77	CINCINNATI	W8XAL	49.50	6.06
PODEBRADY	OLR4B	25.51	11.76	COPENHAGEN	OXY	49.50	6.06
DAVENTRY	GSD	25.53	11.75	MOTALA	SBG	49.50	6.06
WINNIPEG	CJRX	25.60	11.72	BOGOTA	HJ3ABD	49.59	6.05
RADIO COLONIAL (Paris)	TPA4	25.60	11.72	BOSTON	W1XAL	49.67	6.04
HAVANA	COCX	26.24	11.43	ZEESSEN	DJC	49.83	6.02
TOKIO	JVM	27.93	10.74	BOGOTA	HJ3ABH	49.85	6.01
BUENOS AIRES	LSX	28.99	10.35	HAVANA	COCO	49.85	6.01
RUYSSSELEDE	ORK	29.04	10.33	PODEBRADY	OLR2A	49.92	6.01
MADRID	EAQ	30.43	9.86	GEORGETOWN	VP3MR	49.92	6.01
HAVANA	COCQ	30.77	9.75	MONTREAL	CFCX	49.96	6.00
BUENOS AIRES	LRX	31.06	9.66	MEXICO CITY	XEBT	50.00	6.00
LISBON	CT1AA	31.09	9.65	MOSCOW	RW59	50.00	6.00
ROME	2RO	31.13	9.63	VATICAN CITY	HVJ	50.26	5.97
CARTAGENA	HJ1ABP	31.25	9.62	MARACAIBO	YV1RB	51.28	5.85
MOSCOW	RV96	31.25	9.60	CARACAS	YV5RC	51.72	5.80
RADIO NATIONS	HBL	31.27	9.59	KHARBAROVSK	RV15	70.20	4.27
PHILADELPHIA	W3XAU	31.28	9.59				
SYDNEY	VK2ME	31.28	9.59				

G2NO
H. R. ADAMS

WEBBS

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Britain's Leading Amateur Supply House

**COMMUNICATION TYPE RECEIVERS
AMATEUR TRANSMITTERS
COMPLETE EDDYSTONE RANGE**

**HALLICRAFTER
1938 SKY RIDER**



- 5 to 550 meters.
- 1,000 degree Electrical Bandsread.
- "R" Meter.
- 11 Tubes.
- Accurately Calibrated.
- 230 volt Input.
- Optional Crystal Filter.

**HARVEY 1938
MODEL 80T
TRANSMITTER**

Compact
10 to 160M
Phone
C.W.
M.C. Meters
6L6
Oscillator
RK20
Output
Reasonably
Priced



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U.T.C. Modulation Transformers:
VM 1 29/-
VM 2 37/-
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T 5741 Input 6C5 to PP6C5's 16/-
T 8459 PP6C5's to 6L6's ... 18/6
T 8470 AB 6L6's to R.F. Load 38/6
PA 51AX 17/-
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PA 50AX 47/-

**EDDYSTONE TRANSMITTING
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High Voltage Types (Plate spacing
0.187 in. stator to rotor surfaces).
Cat. No. 1078. .0001 mfd. single
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Price £1 12 0
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Split Stator. Code TRINK.

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**McELROY'S 1938 SENIOR
"BUG" KEY**

Obtainable only from Webbs ... 38/-
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TAYLOR'S Famous T20 ... 17/6
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All other useful tubes in stock.

R.M.E. 69 1938 MODEL



- Full Electrical Bandsread.
- 9 to 550 meters.
- Nine Tubes.
- Optional noise silencer Unit.
- Crystal Filter.
- 110 to 230 volt Input.

**HARVEY 1938
MODEL UHX 10
TRANSMITTER**

**MAINS OR BATTERY OPERATED.
PHONE C.W. or M.C.W.
10 WATTS OUTPUT ON ALL
BANDS.
CRYSTAL CONTROL 10 TO 160
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ELECTRON COUPLED FOR 5
METERS.
GENEMOTOR OPTIONAL.
6L6 OSCILLATOR: 6L6 PA.
GLASS B MODULATOR: HIGH
GAIN MICROPHONE.
POWER DRAIN 150 WATTS FROM
A.C. LINE.
DIMENSIONS: 12 in. by 6 1/2 in. by
7 in.**

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ON
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