

The

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SHORT-WAVE MAGAZINE

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JANUARY
1939

—
VOLUME II
NUMBER 11

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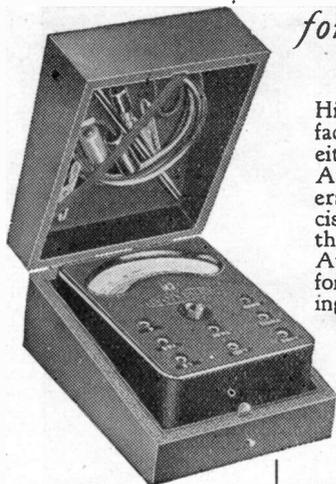
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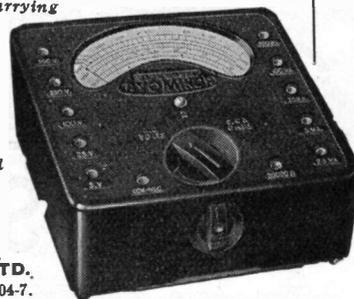
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The
Short-Wave Magazine

No. 11, Vol. II.

JANUARY, 1939

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Resolutions

WE FORBEAR to perpetrate the usual *cliché* about the breaking of New Year resolutions—which is inevitable, like the famous people who tell us through the newspapers that they cannot keep a diary after January the first.

Rather, we would like to look into some of the things which really need doing in the sphere of Amateur Radio in this coming year of 1939. Our contributor "Old Timer," as one of the best-known amateurs in the world and who has been through every phase of the game, speaks in this issue with authority and accumulated experience on the future of 7 Mc. We would counsel all users of our most congested communication band to ponder his words.

Next, we feel that there are several directions in which the authorities might turn their attention. The continued abuse of licence regulations, against which we have been campaigning for many months and which is chiefly due to an unsatisfactory and uneven inspection system; the inflexibility of the higher authority at the GPO with regard to the granting of reasonable power facilities, such as are enjoyed by amateurs in most other countries, this in turn being the main contributory factor in the widespread disregard of the ridiculous power restrictions which British amateurs are expected to observe. In our considered opinion, and speaking from a close knowledge of the situation, we do not think that increasing the power limit to 250 watts would make any noticeable difference to the condition of the amateur bands.

A Happy New Year to You

At the same time, while the regulations stand as they do, we need scarcely say that no one breaking any of the terms of the licence can expect either support or encouragement from us.

It is also high time some more positive move was made towards legislating against the sort of interference which is shortly to be encountered in large towns not only by amateurs, but also by listeners generally. A certain firm is now producing RF-operated neon-sign systems, which consist of self-excited push-pull oscillators fed with 100 watts of raw AC, the output being tuned to 40 metres. With a few hundred feet of neon tubing energised from such a source (which is apparently not a transmitter in the legal sense and is therefore beyond control) the area of interference can well be imagined.

Finally, there are still the questions of ARP radio co-operation, the practical possibility of establishing an Emergency Communications System—for which neither the equipment nor the personnel now exist in the official radio-operated services—and the necessity for the Army also to inaugurate a recruiting scheme from the ranks of amateurs before they are all taken by the Royal Navy and the Air Force.

Yes, there is much to be done. The only question is—shall we be having to say the same thing in January, 1940?

Austin Joseph
C.B.S.

Five-Metre News

By A. J. Devon

Wx and DX—Latest Inter-G Working
—New Data—American Notes

DURING THE last two months or so there has been much discussion among those interested in 56 Mc as to the effect of local weather on G working at medium and DX distances. Here we might remark that it is by now universally accepted that medium-distance contacts are those taking place over 50-100 miles, that anything outside the 100-mile mark is DX, while "real DX"—which we have yet to experience in Europe so far as general operation is concerned—is represented by such outstanding occurrences as G5MQ's two-way QSO with I-1IRA, G2XC's reception of another Italian station, and the logging of G2HG's CW in Switzerland.

It is worth mentioning again that all this European DX was achieved on the same day, July 2, 1938, and practically at the same hour.

To go still further in getting the potentialities of 56 Mc tied down, advanced amateur thought has long since rejected the official theory that waves shorter than about 7 metres could only be received over "visual" ranges, and there is now so much evidence to the contrary that any idea of 56 Mc being a band for purely local working is only discussed in those circles out of touch with current results and methods.

All this brings us down to the spell of mild weather during the first week or ten days of November, when the band appeared to open for distances of 50-130 miles, and several new QSOs were recorded, such as G2OD-G6DH (84 miles), G5BY-G6DH (61 miles), G5BY-G6QZ (105 miles), while further contacts were made on the G5BY-G6FO schedule over 126 miles; these results were all reported in our December issue, where the "mild weather theory" was also mentioned and its possible effect on conditions discussed.

● New Data

Between about November 12 and December 11, there was practically no after-dark or late evening working from G6FO, the schedule with G5BY being kept at 1600 GMT on Saturdays and Sundays only, with many QSOs logged. Then came the period of bitter weather between December 11 and 23, with fog, snow and ice, and temperatures well below freezing not only at Croydon and Newport, but all over the country.

This is where the story begins to take on more interest. A daily schedule at 2215 was started from December 11 and G5BY and G6FO were able to maintain contact—often with signals peaking to R7 both ways—on most evenings right through to December 19, which was reported by the newspapers as one of the coldest days in England for ten years. Our two 56 Mc stalwarts, teeth chattering and fingers blue—and their feet on the power transformers for a little warmth; G5BY's HT supply caught fire, incidentally—made one of their best contacts on this particular evening. Croydon was under snow and it was freezing hard at Newport—and the distance was still 126 miles.

The nett result of this period of operating between December 11 and 19 showed seven actual

QSOs, though some were a little thin in that they were not absolutely solid, while on one or two evenings they could barely hear one another. Daylight and dark reception was obtained on odd occasions at both ends.

Conditions were exceptionally good at times and on Monday, December 12, G6FO heard G6DH (Clacton, 180 miles) at R2 for an instant. A test arranged via G5BY immediately after failed to bring G6DH in again, however. On the Wednesday, G6FO was reported by G2MC (Pinner, M'sex, 112 miles) and on the following Saturday—after G5BY's 'phone had been copied by G6FO for the first time, S4-5—QSO was made between G2MC and G6FO. Best reports were RST-329 at Newport and 559 in Middlesex. G2MC was using a $\frac{1}{2}$ -wave dipole with a transmitter input of 50 watts, CC.

All the signals reported and QSOs made were accompanied by QSB, sometimes to zero, and often with sharp peaks to QRKs well above the average strength. Once again, it was very evident that low-level bending was taking place.

● Strange Sequel

Then, after December 19, a curious thing happened, confounding the "mild weather theory" once and for all so far as these observations go. The thaw and slightly warmer weather set in from this date and for three nights to December 22 G5BY and G6FO lost one another completely, not a sound being heard at either end. Conditions came back with a bang on December 23, G6FO being R7 "'phones on the table" at Croydon and G5BY's telephony R5-6 at G6FO; this with 6-ins. of snow in London and a frost in South Wales. G5BY remarked that conditions had been very bad on other bands as well during the three blank days.

Contacts G5BY-G6FO followed on December 24 and Christmas Day at various times, the Croydon 'phone again being solid copy at 1235-1250 on December 25. G6XM and G2BI were also there on Christmas morning and a good QSO G6XM-G6FO (98 miles) was recorded. G6XM reported that G5BY and G6FO were about the same strength with him at Farnborough and G2BI said he thought he could hear G5BY's CW (82 miles); G6FO (45 miles) was given R6 on the indoor receiving aerial at G2BI. These notes have brought us to Boxing Day, when the band was dead in the morning.

● Conclusion ?

From all the foregoing it seems safe to conclude that so far from mild weather improving 56 Mc conditions, local weather has no influence whatever on propagation at these frequencies, any more than it has on any other band.

We have always maintained that the relationship (if any) between weather effects as such and radio results can only be observed by taking into consideration conditions existing not only over the entire surface of the earth, but deep into its surrounding atmosphere as well.

So that is another 56 Mc datum point pegged down—or are we being too previous? Perhaps, but we should in any case qualify our remarks by saying that aerial leakage losses inevitably increase in bad weather—with insulators frozen over or wet and ice or snow on the aerial. . . .

● American Notes

E. H. Conklin, W9FM, Associate Editor of RADIO, the well-known American amateur magazine, will have some interesting things to say about UHF work in his January issue. W6QLZ of Phoenix, Arizona, heard London and Paris television signals from October 28 to November 4, and on the latter day all channels up to 46 Mc were open.

W9FM also calculates that if 500-mile skip is evident on 14 Mc, 28 Mc should be open from distances of 1,900 miles; likewise, with 28 Mc open at 500 miles (medium-distance Europeans in our case) 56 Mc should show life at 1,900 miles—how we wish it would! The 28 Mc condition is observed often enough.

These are winter figures. In the summer, the distances are less, and Conklin remarks that on June 5, 1938—one of the best 56 Mc DX days in the States—2½-metre signals would probably have come down 1,200 miles away!

The January issue of RADIO will also record maintained communication over distances up to 300 miles maximum, though we gather there has been nothing more in the nature of the 1,000-mile-and-over DX enjoyed by W's on 56 Mc during the summer. It seems that serious attention is now being paid to the band by an even larger number of operators and that frequency-controlled transmitters working to CW receivers are *de rigueur*. It is also being found that in order to cover these comparatively long distances consistently, beam arrays are very desirable, though simpler types of aerial will get the signal across almost equally well when conditions are good.

VK2NO of Sydney, however, agrees with us on the question of aeriels; that in the present state of things, when the band can only be explored, it is better to use omni-directional systems as much as possible, in order to get coverage rather than directivity.

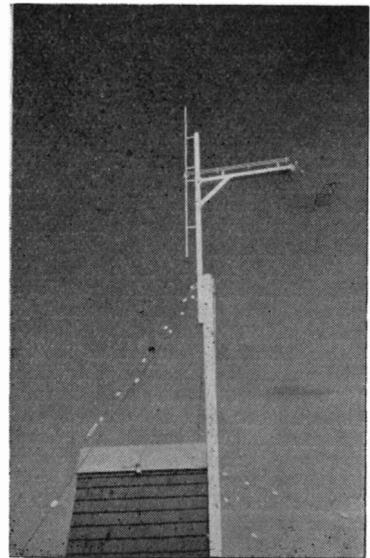
We appear to be alone in one other respect, though—that is, the type of receiver to use. While the superhet has many advantages, there is no doubt that an efficient straight receiver will find anything coming to the aerial on 56 Mc, just as it will on other bands. In view of the high noise-level and low conversion-gain (which can admittedly be overcome to some extent with a tuned RF stage) we do not see that the 56 Mc superhet offers any particular superiority over a good straight receiver . . . and we have yet to meet a *commercial* superhet design which will do better than even a moderately "hot" 0-v-1, while a 1-v-1 with an efficient RF stage takes a great deal of beating.

● Other News

G2BI (Calne, Wilts) is now on the 56 Mc band regularly and has had several contacts with G6FO (Newport, 45 miles). G2BI's line-up is 6L6 (7-14 Mc)—6L6 (28 Mc)—TZ20 (56 Mc)—T20 (56 Mc PA), with link coupling all through. He has run up against a number of curious problems at the 5-metre end of this transmitter: The TZ20 doubler refusing to double but passing RF into its power

pack when *cold* (we have heard of this before on 56 Mc—it is due to stray coupling, only cured by suitable RF chokes in the feed leads, as in G2BI's case); then he found that the setting of the PA neutralising condenser entirely governed the amount of grid drive to that stage—again probably due to the "pull through" effect and the difficulty of tuning grid and plate sides to dead resonance on such frequencies without slow-motion; G2BI also discovered that even with single-turn links there is a right and wrong way round for them—connecting the links in the right sense gives anything up to four times as much drive. This is a point we might have mentioned before, as we have noticed it ourselves, as have others. G2BI concludes by remarking "Do other people have these difficulties; if not, why not?"

He also is now using—like G6XM, G5JU and several more 56 Mc operators—the 10 ¼-wave end-on



High, free and solitary. The 5-metre vertical radiator at W1BB, Stewart S. Perry, Winthrop, Mass.

aerial as suggested by G6FO, though it is believed that the latter's specimen is still the only one of its kind extant so far as its actual shape is concerned!

● Please!

The results discussed this month and in the December issue of the Magazine make it abundantly clear that there is much very interesting work to be done on 56 Mc and that results well over the 50-mile range with which too many people are now satisfied can be obtained with perseverance and effort—which is all meaning to say that we want much more *regular activity*.

We agree that it is European co-operation (the lack of it, that is) which is the chief stumbling block to progress being made, but at the same time there are people in the South of England who would like more support from the North and distances up to 500 miles are not impossible, even over such a comparatively small land area as the United Kingdom.

Finally, we should like to hear by January 19 from everyone interested in 56 Mc and active on the band.

Transmission for Beginners—II

Modulating a 10-watt Carrier and a page for New Readers

By A. A. Mawse

IN THIS third article on the subject of choke control modulation, we come to the circuit and photographs of the modulator stage proper illustrated here. It was explained how the output from the speech amplifier was insufficient to modulate a carrier of more than 3-4 watts, with the result that a third amplifier valve (the actual modulator stage) has been added, using the simplest form of coupling.

● Application

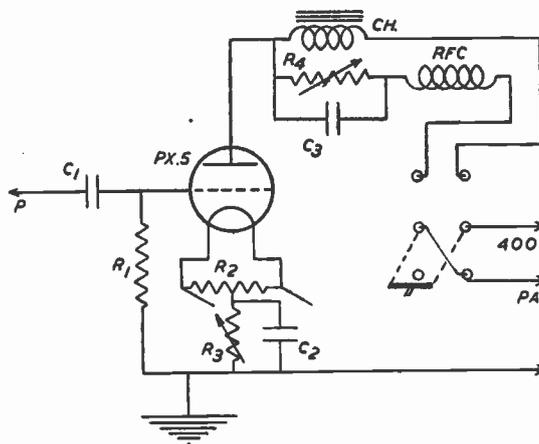
The theory of adjustment, control and effect already fully discussed (November and December issues) still applies, and it only remains to mention the following points: C1 is the coupling condenser from the speech amplifier; R1 the grid return; C2, R3 form a variable automatic bias network; the switch is arranged to give 'phone/CW operation. The remaining components had full explanation in the issues referred to above.

We may regard the modulator as a normal LF stage with bias adjustment to control standing plate current, the variable resistor R3 having a fixed value of 500 ohms in series to safeguard against totally cutting bias (seen in the photograph, but referred to as a single component in the circuit). By setting R3 until about 60 mA are passing to the plate a condition is reached where 24 watts input means roughly 6 watts AC output, for modulating a 10-watt carrier. The output stage of the speech amplifier already described will provide enough drive to the PX5 modulator for this audio power to be obtained.

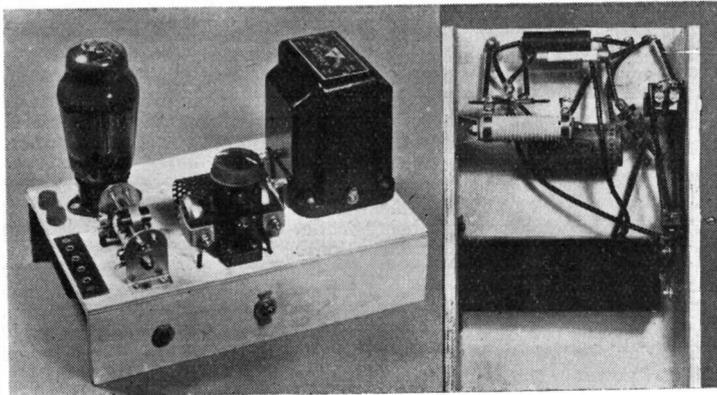
● Adjustment

Here are the operating notes, in correct sequence: Switch on CO and tune for drive; HT on PA and adjust for nine or ten watts PA input at resonance, with AA connected (24 mA, 400 volts in our case); switch on amplifier and modulator; plug meter in

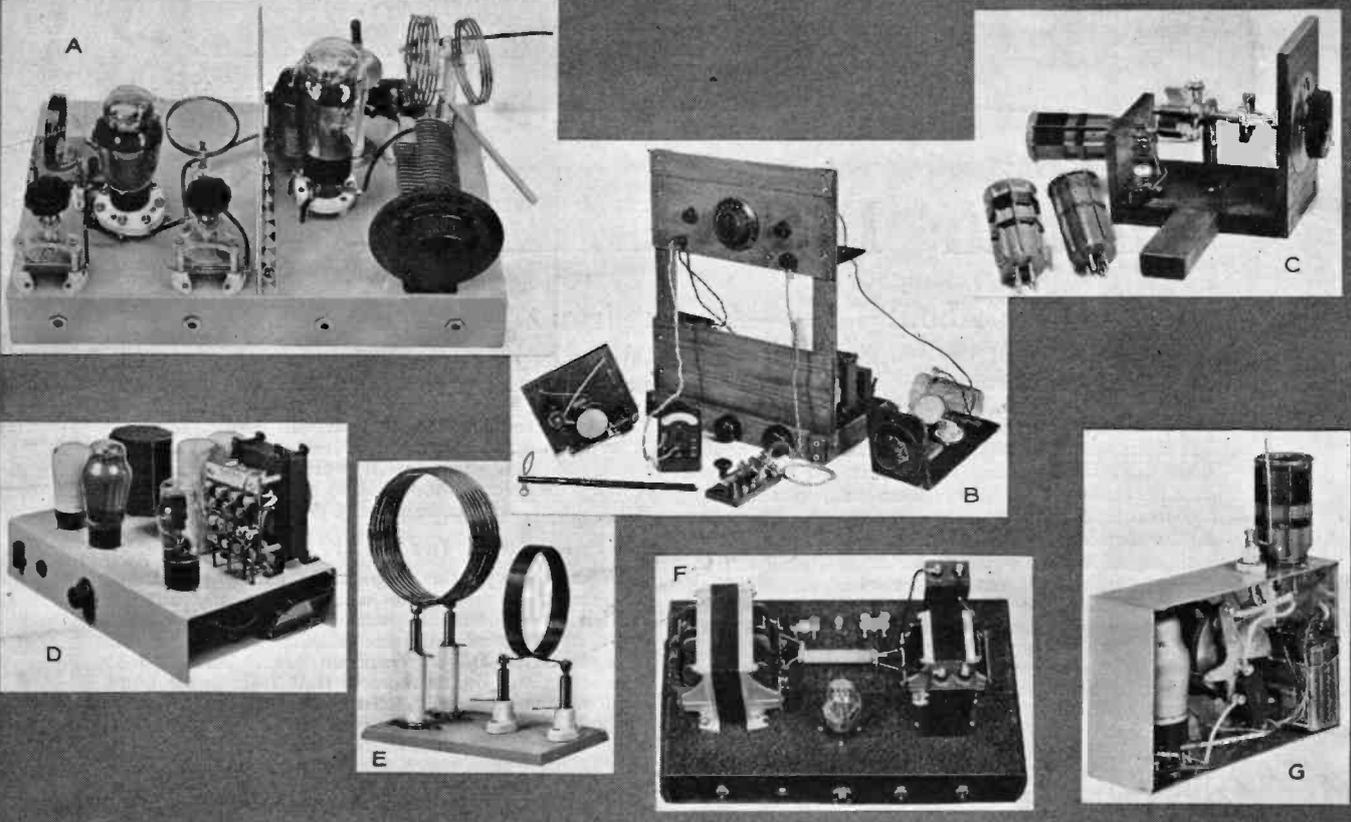
the modulator plate and set bias control resistor R3 to get a reading of about 60 mA at 400 v. (or 24 watts); check PA reading again to see what difference this load may have made and correct if necessary by increased drive; test modulation by previously explained methods (upward flicks of AA bulb or loop lamp, good speech in the monitor, and a carrier "full of speech" as heard on the frequency meter pick-up), using R4 to control depth. The aim of the whole adjustment is to obtain full and clean modulation of the 9-10 watt carrier with the lowest modulator input. A setting of 17-18 watts in the PX5 (by increasing bias and reducing plate current to 40-45 mA) will probably be about right. But start with full input to the modulator. Do not forget, also, to work with the amplifier gain control (microphone circuit) at least half open. If the



Modulator circuit with switching to change from 'phone to CW. The valve is a Hivac PX.5 and point P goes straight to the plate of the preceding stage. Note that variable automatic bias is used, enabling modulator and PA valves to be properly balanced. The choke RFC would be better connected in the PA feed lead such that it is always in circuit.



Two views of the modulator. The separate sockets are for filament supply; "P," "400," "PA" and earth are connected via the lower strip. The fixed bias resistor referred to in the text is underneath the left-hand variable resistor (R3).



.. from Tuning Loop to Complete Transmitter !

speech amplifier is working full out and the modulator input cut too low, the result will be distortion due to overloading of the modulator on the grid side. Only experiment can determine the optimum settings of these various controls in individual cases.

The constructional photographs should make clear the general idea, layout being of minor importance. New parts required are R1, 100,000 ohms, 1 w.; R3, 500 and 700, both 20-watt; DPDT switch; valveholder; C1 (.01 mF); C2 (25 mF, 50v), Bulgin. Pentode output choke (amplifier); 40-ohm centre-tapped filament resistor (R2), Varley. Hivac PX5 valve; Clix plugs and sockets, "Master" type for filament.

Our composite photograph is to show new readers the apparatus already described in this series; each piece of equipment has had detailed attention and full discussion, while from the first article (March, 1938) where Licence matters were explained, the steps have led in easy style to the installation of a complete ten-watt 'phone and CW transmitter with its sundry associated gear.

March

Licence conditions—the amateur bands—frequency measurement (a 100 kc quartz crystal oscillator), seen in the lower left-hand corner of "B"—circuit of a 1.7 Mc Hartley oscillator.

April

Constructional details of the Hartley, an absorption wavemeter and the artificial aerial (B).

May

BCL interference—a mains filter—key filter—wave

trap—constructional notes for the absorption wavemeter (C).

June

The speech-amplifier-modulator (D) was fully described, followed by notes on a station log.

July

A 'phone monitor for all bands (G)—a crystal oscillator, forming the basis of the complete transmitter (A)—coil-making (E).

August

A power supply giving 500 volts 120 mA (F)—conversion from CO to Tritet.

September

Adding an RF power amplifier—the theory and practice of neutralising.

October

Practical treatment of the electron-coupled oscillator—re-arrangement of components to make the now standard CO-PA, tritet-PA or ECO-PA possible (A).

November-December

Switching for ECO/CO—modulation considerations, using the amplifier (D).

* * * * *

Articles in succeeding issues will take in the wider aspects of Amateur Radio, dealing with aerial systems, other types of transmitters and modulators, and new forms of construction, also covering a range of simple battery transmitters and portable apparatus.

On The Amateur Bands

By Old Timer

About 7 Mc—An Important Discussion

WE ADDRESS OURSELVES this month to all who work on that unhappy band—7 Mc—especially those whose full-time occupation is “40-metre ‘phone.”

It is true to say that the large majority of newly-licensed stations make their *debut* on this band, some on exclusive CW and others with ‘phone only; as a result “40 metres” has come to be looked upon as the newcomers’ or “lids’” band, and much gnashing of teeth by the older hands has been the result. But these more experienced amateurs do not come on 7 Mc in an endeavour to show how operation should be conducted—they just stay off and leave it for ever.

Now it strikes us that a little discussion and thought between ourselves may do a lot to help the present operators and also make 7 Mc a band fit for everyone to use. We can divide the occupants into four main groups: (1) the exclusive CW users; (2) the exclusive telephony people; (3) the “DX only” fraternity, and (4) those who combine the activities of the first three. Now, every amateur in groups 1-3 will no doubt believe that his side is the only one worth considering, but a moment’s thought will perhaps convey to him that such an attitude is selfish in the extreme and does not lend much in the way of co-operative spirit to all who wish to use 7 Mc. We therefore strongly recommend that every amateur worthy of the name should become acquainted with all methods of operation and the points in favour of each.

● Mutual understanding needed

It is on this basis, then, that we propose to tackle the question of improving the present-day condition of 7 Mc. Let us dissect that all-too-common type, the “telephony only” enthusiast. He probably enjoys himself immensely at all hours of the day and night, including DX Contest periods, and grumbles when long skip is on and he is unable to hear any ‘phones of sufficient strength to work. It is in such circumstances that it will pay him to listen carefully for CW DX, which others nearby may be trying to raise. Early mornings in the winter invariably produce quantities of CW DX which his ‘phone is effectively covering. Our suggestion here is that the “exclusive ‘phone” amateur ought to choose his times for ‘phone operation when the band is not open for DX, and if he wishes to come on during DX periods he should try and find out for himself whether there is anything in this “dit-dah-dit-dah” business after all.

Equally, the CW operator may well attempt to see if there is something in the ‘phone man’s case, by trying this method of communication, thereby improving his knowledge of radio technique; there are times when ‘phone is quicker and more suitable than CW. This latter point applies also to the amateur who is *only* interested in DX; he will find that local ‘phone and CW contacts outside DX hours, will broaden his knowledge of Amateur Radio and

provide much enjoyment and instruction as well.

By being conversant with all sides to this question, a more balanced outlook will result, together with an improvement in operating sense, and we shall not hear one station working another about a miles away on ‘phone, while a third is in contact with U.S.A. or Australia on CW at the same time.

● 7 Mc and the Solar Cycle

Unfortunately, the large and healthy growth of licences throughout the world, especially in the British Isles, coincided with the maximum of the sun-spot cycle of radio conditions, with the result that very little DX appeared on 7 Mc. This created a belief among the newcomers that 7 Mc was a band for local contacts only, as stations up to 500 miles away came through so strongly and reliably that schedules could be maintained with very low power. It will have been noted by many people that 7 Mc has *not* behaved recently quite in this fashion,* and the reason is believed to lie in the fact that *we are now witnessing the change in conditions following the passing of the peak of the solar cycle.* If this is really so, we shall gradually return to conditions similar to those existing in 1930-31-32-33, when 7 Mc was the DX band. 14 Mc had “folded up” and 28 Mc produced no signals at all.

● Looking ahead

Imagine what the band will be like in a few years’ time—skip will be as long as it is at present on 14 Mc. How then shall we be able to work any DX at all if there are the present-day number of G ‘phones (plus the G4’s and G7’s and G9’s!) all trying to hook somebody across town? It will clearly become necessary for these telephony exponents to cultivate a working knowledge of CW again and they will be pleasantly surprised at the excellent reports that can and will be obtained from DX parts, even with inputs as low as 5-10 watts. It is an established fact that DX signals appear to be louder and suffer less from QSB on 7 Mc than on the higher frequencies, and even this winter DX has been rolling in after dark, especially in the early mornings.

● The New 7 Mc

Couple the thoughts contained in the above paragraph with the possibility that the range from 7200-7300 kc will not be of much practical value owing to its occupancy by broadcast stations, and you will see that 7 Mc will be a band of no use to anyone in any group unless we *start now* to control our operation in the best interests of all amateurs. One further thought—7000-7200 kc is exactly half the width of the 14 Mc band, and more stations work on “40” to-day than on “20.” 7 Mc can no longer be looked upon as a “lids’” band, but must be

[* *The other day we heard a G3 complaining that conditions were bad on 7 Mc because he could only hear distant Europeans!*—ED.]

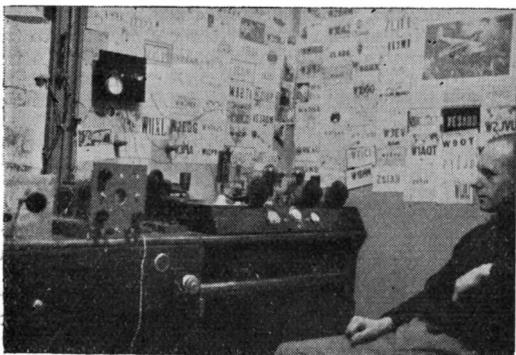
tackled with all the skill and experience that amateurs as a body can lend to make this channel a reliable medium for communication.

● Receivers

And now a word about receivers. Many times telephony stations have been heard to admit that their "all-wave" receiver was not capable of beating with CW signals because it incorporated no BFO valve! The receiver of the future must tune out telephony signals within a few kc and have some form of single-signal control. We can almost hear some of you complaining that you cannot afford to buy such a receiver—to which we reply, "No, but as experimenters you should be able to *build* one for a few pounds." Full enjoyment cannot and will not be possible on 7 Mc unless such a receiver is used, especially as it is quite conceivable that twice the number of regularly active stations will use this channel in five years' time. Think it over.

● Station Note

G6WR of Whitehaven, Cumberland, entered the ranks of Amateur Radio in December 1932. 2BAU was granted in August 1933 and graduation to full



call took place in February 1934. In August 1935 a contact with VK5WR gave him the WAC and WBE certificates.

Power is at present supplied from two packs giving 300 and 500 volts respectively, but before AC was installed the old DC mains ran a 500 v. converter. 10 watts is used in the final stage of a 3-step transmitter consisting of a P625 CO, P625 FD (or BA) and T25D PA. During certain contests permission is usually sought to use 25 watts and 70 countries, with 27 on 'phone, have been worked. His aerials consist of a 66-ft. end-fed and a half-wave Windom for 14 Mc; considerable success has been obtained with this latter type recently using 14 Mc 'phone. G6WR's receiver is a 1-v-1 battery job working off a small rectifier. Grid modulation is employed by means of a 3-valve RC amplifier feeding the grid of the T25D through a choke filter and transformer coupling.

We are grateful to GW3CF of Rhyl for sending a photograph of his equipment but unfortunately it is not clear enough for reproduction and we should be glad to receive a better one. GI8LF, whose station was recently described in this page, has had a contact on 1.7 Mc with HB9T, which proves that there is much of interest to be found on this band, and in another issue we hope to have a little discussion about 160-metre working.

By the time you read this, another New Year will

Notes and News from the East

By Wm. H. G. Metcalfe, VU2EU

THE COLD SEASON is now upon us and conditions are very similar to this time last year. The 14 Mc band opens for DX between 1130 and 1630 GMT. After 1630 GMT (2200 IST) even the Empire transmissions commence to fade out and reception is very unreliable. 28 Mc is good for an odd half-hour at a time but is very erratic.

Ahmad Nawaz of Lahore reports this month; he lists the following VU stations heard on telephony: VU2CA, CQ, DR, GJ, JK, JL (YL operator), LL and HQ. He mentions that VU2CQ is using 300 watts. Other VU's known to be on 'phone as well as CW are VU2FQ, JM, FU, DG, and 7FY (Mysore State). VU2ED and 2EU are also testing telephony on 14 Mc and would appreciate reports. There are a number of 'phone stations in Burma and the following are known to be active: XZ2DY, PB, JB and EX. XZ2KR has been heard on CW.

● New Far East DX

To those who like rare countries the following information, which was obtained from the New Zealand magazine "Break-in" via ZL4FV, will be of interest. Tristan da Cunha is the latest island to have radio installed, and the call ZOE will be used for commercial working and ZD9AB on the amateur bands. This island is one of the loneliest in the world and is more off the beaten track than Pitcairn.

VQ5ELD has shown up on 14 Mc and cards can be sent c/o Post Office, Entebbe, Uganda. Another new station is XU7TH, Tsinghua University, Kunming, Yunnan, China. The transmitter is owned by the Radio Research Institute but the operator is an American-born Chinese; he wants reports on both his 'phone and CW transmissions and will QSL 100 per cent. HS1BJ says that he is the only licensed amateur station in Siam and that anyone else using an HS1 call is a pirate.

While on the subject of pirates, VU2EU's call is being misused by some station in the same locality; cards confirming contacts he has never had, also a number of complaints from BCLs about QRM, have come in for times when the real VU2EU was off the air!

● Jumping Crystal

VU2EU has had some bother with a crystal which should oscillate on 14380 kc; it suddenly went off tune and the transmitter had to be re-adjusted to a much higher frequency—this was found to be dead on top of one of the 19-metre Empire stations. VU2EU is now wondering if the BBC would care to have the rock as it is not much good for 14 Mc work!

Reports from stations in India, Burma and Ceylon should reach Wm. H. G. Metcalfe, VU2EU, 3rd Indian Divisional Signals, Meerut, U.P., by the 5th of each month for the following month's issue.

have commenced, and we hope that you will resolve to be a "bigger and better" amateur in 1939. Over-modulation, long test calls, chirpy notes, poor sending, and "tripe talk" to be abolished for ever, with the resolve that you will *always* help the newly-licensed ham on the right road.

The Cathode-Ray Tube—III.

Deflection Voltages — Impedance and Stage Gain Measurements

By A. F. Hollins

(Messrs. Mullard Wireless Service Co., Ltd.)

IN CONSIDERING the various images produced on the screen of a Cathode-Ray Tube by the application of given voltages to the deflector plates, it should be continuously borne in mind that the displacement of the beam is in fact the displacement of a single spot, and that no matter how complex the resultant image may be, it is being traced by the rapid movement of a single spot of fluorescence. The fact that the image produced may consist of a continuous line or a series of lines is due to the persistency of vision created by the eye failing to respond to individual changes occurring beyond a certain rate.

In order to observe in more detail the manner in which a complex image may be built up, it will be worth while to examine still further the movement of the fluorescent spot caused by the application of DC voltages to the deflector plates.

● Spot Control with DC

Assuming that a DC voltage source is connected across each pair of deflector plates in such a manner that the top plate of the vertical pair is positive with respect to the bottom plate, and the right hand

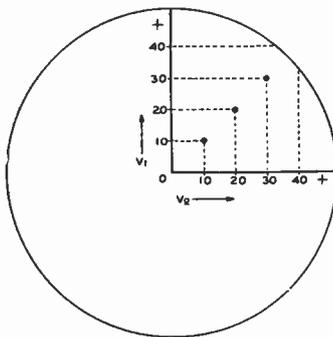


FIG. 7.

Showing spot displacement due to equal values of DC voltages between horizontal and vertical plates.

plate of the horizontal pair is positive with respect to the left-hand plate, and commencing with zero voltage on both pairs of plates, the spot would be in the exact centre of the screen. Now, by increasing the voltage across the vertical plates in steps of say 10 volts, the spot will take a new position at each change, moving towards the top plate. Similarly, by reducing this voltage to zero, and applying a series of voltage changes to the horizontal plates the spot will move correspondingly towards the right-hand plate.

If now the experiment is repeated with both the vertical and horizontal voltages applied at the same time in equal increments, the spot will move as shown in Fig. 7. Examining this diagram, it will be noted that the displacement of the spot from

zero along either axis is exactly the same whether the voltages are applied singly or together, and the resultant spot position is in accordance with the deflecting force exerted by both voltages. It will thus be readily appreciated that by correct manipulation of the respective voltages the spot may be moved to any position within the top right-hand quadrant of the circle representing the screen of the cathode ray tube, *but only within this quadrant*.

In order to position the spot elsewhere on the screen it will be necessary to change over the polarity of the voltage connected to one pair of plates; for instance, reversing the connections to the horizontal plates would position the spot within the top left-hand quadrant of the screen, and reversing both voltages would bring the operating area to the bottom left, and so on.

● AC voltages

In Fig. 6 of the previous article, a diagram was shown illustrating the manner in which a sine wave was produced on the screen as a line, and it was

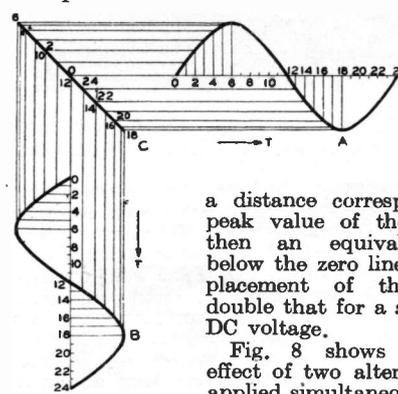


FIG. 8.

seen that the beam could be considered as having first made an excursion above the zero line to a distance corresponding to the peak value of the voltage, and then an equivalent excursion below the zero line, the total displacement of the spot being double that for a similar value of DC voltage.

Fig. 8 shows the combined effect of two alternating voltages applied simultaneously, both voltages A and B being of the same amplitude and in phase. The spot movement C is proportional to the resultant of two forces at any instant and will therefore, in the case under consideration, be diagonally across the screen at an angle of inclination to the horizontal axis of 45° as was the case for the two equal DC voltages.

It should be obvious that any alteration in the voltage applied to one pair of plates will cause the angle of inclination of the line to change; for instance, if the horizontal voltage is gradually decreased, the line of deflection would tend to become vertical, and if the vertical voltage is reduced the line will gradually approach the horizontal axis.

The angle of inclination therefore is a direct indication of the relative amplitudes of the two voltages, and the further fact, that the image is inclined to the left of the vertical axis and is a single line pattern, is an indication that there is zero phase difference between these two voltages.

Introducing a phase difference between the two voltages causes the straight line to change into an ellipse, and by increasing the phase angle still further the ellipse becomes broader; finally, at a phase angle of 90° between the two potentials a perfect circle is formed, assuming both voltages to be equal. For phase angles greater than 90° the circle again becomes an ellipse, but now the direction of inclination of the ellipse is to the right of the vertical axis.

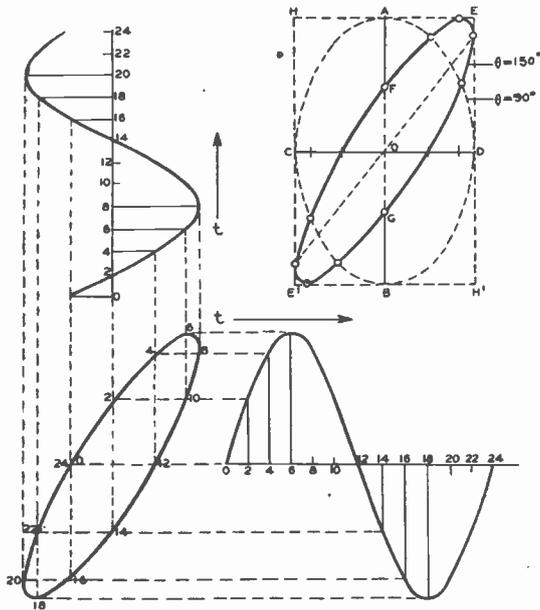


FIG. 9.

Diagram showing the formation of an ellipse from two sine waves out of phase and of different amplitude

Fig. 9 shows how an ellipse is formed by two sine waves, between which there is a phase difference of 150°. In addition to the phase displacement, the two sine waves are of different amplitude, and it is important to note that the dimensions of the rectangle HE H'E' shown at the top right-hand are given by the ratio of the voltages on the two pairs of plates. All curves corresponding to this voltage ratio, no matter at what phase angle they are plotted, fall within the rectangle and touch it on all sides. It is an easy matter to mark out this rectangle straight from the screen of a cathode-ray tube on to a sheet of transparent squared paper, and to trace out the ellipse, from which the voltage ratio and the phase angle may immediately be determined. At this point it should be remarked that it has been assumed in discussing the resultant figure to be obtained by the application of given voltages to the deflector system that the deflection sensitivity of each pair of plates is the same, but such is not usually the case, and where the deflection sensi-

tivity is different between the horizontal and vertical plates correction must be made for this.

● Impedance Measurement

Fig 10 shows a method of measuring an impedance such as that of a loudspeaker. The loudspeaker is connected to an AC voltage via a series resistance R2 (equal to the internal resistance of the

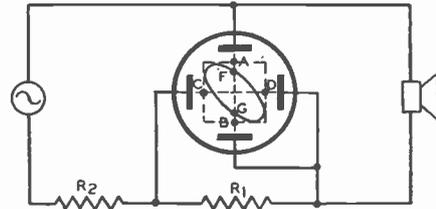


FIG. 10.

Diagram of circuit used for measuring the impedance of loudspeakers or output transformers.

valve normally used with it), and a resistance R1 of known value is interposed in the circuit. The voltage drop at the terminals of R1 is applied to one pair of plates, and to the other pair is applied the voltage E at the loudspeaker terminals.

The loudspeaker impedance is $Z = \frac{E}{I}$ where E is the voltage across the loudspeaker and I is the current through it, which is given by the equation $I = \frac{E'}{R1}$ (E' being the measured voltage-drop at the terminals of R1). There results a value of $Z = \frac{E}{E'} \cdot R1$, or referring to Fig. 10, $Z = \frac{AB}{CD} \cdot R1 \cdot K$; where K is the ratio of the deflection sensitivity in the directions AB and CD.

Fig. 11 gives a practical example of an impedance measurement carried out in this manner, using the circuit shown in Fig. 10. The loudspeaker under test and the resistance R1, which has a known value

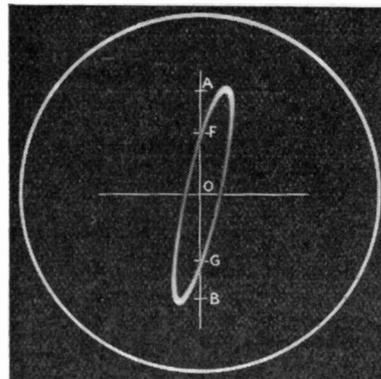


FIG. 11.

Diagram of image on cathode-ray tube from which impedance and phase angle measurements may be taken.

of 2800 ohms are in the anode circuit of a valve PEN/B4, so that R2 represents the impedance of this valve. The measurement was taken at 500 cycles, and in accordance with the above formulæ the impedance is found to be

$$Z = 2800 \times \frac{41 \text{ mm.}}{11.5 \text{ mm.}} = 10,000 \text{ ohms.}$$

From such a diagram as Fig. 11 it is also possible to calculate the power output of a receiver under given operating conditions.

THE CATHODE-RAY TUBE

● Amplification of a valve stage

From the observation of such simple diagrams it is also possible to measure the amplification of a valve stage, and for this purpose one pair of plates is connected to a constant AC input voltage E_1 , Fig. 12 and the other pair to the output voltage E_3 . When E_1 is of the same value as E_3 , the ratio $\frac{E_1}{E_2}$ is equal to the amplification of the valve.

This ratio can be read from a calibrated potentiometer R. The product of E_3 and the deflection sensitivity of the pair of plates to which this voltage

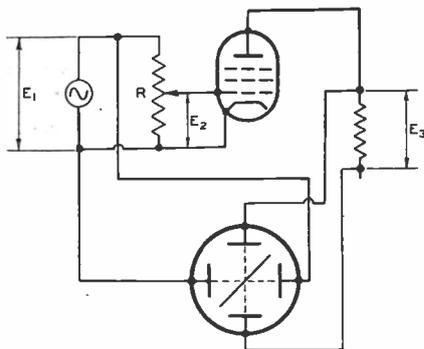


FIG. 12.

Circuit arrangement for measuring the amplification of a valve.

is applied is equal to the product of E_1 and deflection sensitivity of the other pair of plates when the line on the screen is inclined at an angle of 45° .

The potentiometer therefore is adjusted to the point at which this condition is reached, when the amplification can be calculated from $\frac{E_1}{E_2} K$, where K is again the ratio of the relative sensitivity of the two pairs of plates. In practice, of course, the actual figure obtained on the screen of the cathode ray tube would probably be in the form of an ellipsoid, the major axis of which would form the angle of reference.

(To be continued.)

Regular Correspondents to this Magazine are wanted throughout the Empire, also in all English-speaking and foreign countries. Such contributors must be in close touch with Amateur Radio in their localities, but need not necessarily hold a call. Information as to requirements will be supplied on request to the Editor.

The Eddystone E.C.R.

Illustrated herewith is the new Eddystone 10-valve Communication Receiver, which we noticed briefly in our September issue. Having had the opportunity of examining this set closely, we can say without hesitation that it not only constitutes a very effective answer to foreign competition, but also exhibits design features which put it amongst the very best receivers of its type now available.

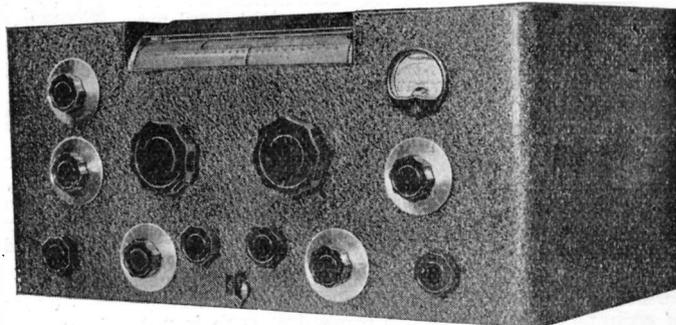
This short review is not in the nature of a test report since the Eddystone E.C.R. is only just getting into production, and test models are not yet available. We hope, however, to discuss its amateur-band performance in an early issue, in the meantime mentioning a few electrical and mechanical points which particularly impressed us when examining the set recently.

The wave-range is 9.5 to 190 metres, in four switched bands, with separate band-set and band-spread giving equal coverage of the five amateur ranges 1.7 to 28 Mc. The tuning motions and scales are particularly good, and the controls well arranged for comfortable operating. A calibrated "S" meter is fitted and of course crystal gate with phasing, AVC and BFO. The circuit is RF, Mixer, Osc., two IF, D-D Det., BFO, 1st and 2nd LF stages and Rectifier for the built-in power supply. RF and LF gain controls are provided, and the available audio output is 3 watts.

The average overall sensitivity is better than 3 mV for 50 mW output, and some selectivity figures are as follow: Crystal out, 20 db down at 8 kc, 60 db down at 21 kc; crystal in and phased, band-width at 20 db down is 150 cycles, and at 30 db down 300 cycles.

The general construction is impressive in its solidity and attention to detail, with a heavy chassis, excellent screening—when the BFO condenser is disconnected with the oscillator running, there is no BFO injection; with many communication receivers, injection is sufficient by stray pick-up!—and all RF leads are short and direct. This again is not always achieved in American designs.

The Eddystone E.C.R. receiver is British throughout, using Mullard valves, and is a Birmingham product well up to the high standard achieved by its leading engineering firms in all fields. We are convinced that Messrs. Stratton have "got something" in this receiver, and though £45 is a lot of money in any language, this price compares very favourably with what many people do not hesitate to pay for similar apparatus from over the water.



The Eddystone E.C.R. Receiver.

... HERE AND THERE ...

C.W.R.—Slow Morse—Group B

The group B scheme of the Civilian Wireless Reserve was brought into force on December 5th, with twelve selected stations in different parts of the country working to GFO on 2727 kc. The Group A organisation and training, with GJW on 2583 kc as main control, is now sufficiently advanced to bring in the deputy controllers of the various regions, together with a number of individual stations selected for training by their local controllers.

With the idea of helping C.W.R. members and others wishing to learn Morse, we are also informed that a regular Morse practice schedule has been established, to take place every Monday, Wednesday and Friday, 2100-2200 GMT, on 2727 kc, call-sign GFO. This will be sent by automatic tape at 8 w.p.m., the speed being put up 2 w.p.m. each month. The material on the tape will be changed weekly, so that listeners will have three chances of copying the same text for one hour every week, with a monthly increase in speed.

For the Morse practices from GFO, the frequency of 2727 kc can easily be located on almost any receiver. Try tuning well down on the 1.7 Mc coils, or towards the LF end of those for 3.5 Mc. We have checked that all receiver designs recently published in the Magazine will find both 2583 and 2727 kc without any alteration being necessary.

Another Amateur Passes

We much regret to record the death of Baron Bonaert de la Roche, ON4HM, of Harvengt, Mons. Not only the owner of one of the leading Belgian stations and the manager of the QSL Section of the Réseau Belge, he was also well known personally to many British amateurs who have enjoyed his hospitality at the Chateau de Marchiennes.

The Peckham Challenge

Two clubs have replied to Peckham's challenge for a listening contest and in order to draw up a fair set of rules we are holding over details until next month. We hope that this may take place during one week-end in February when conditions should be much better than in January. The DX Scribe is to act as judge.

New Factoring House

Messrs. Hamrad Wholesale, 259 Ladbroke Grove, London, W.10, have commenced a factoring business devoted exclusively to the Amateur Radio market, with the ultimate intention of making proprietary products available at dealers throughout the country. As agents for a number of Swiss, French, German, American and Czecho-Slovakian manufacturers, their stock lines at new low prices include a large quantity of truly remarkable items which will be of great interest to the amateur both on account of their ingenuity and application. A catalogue is in course of preparation, but retail orders can only be accepted where dealers are unable to supply.

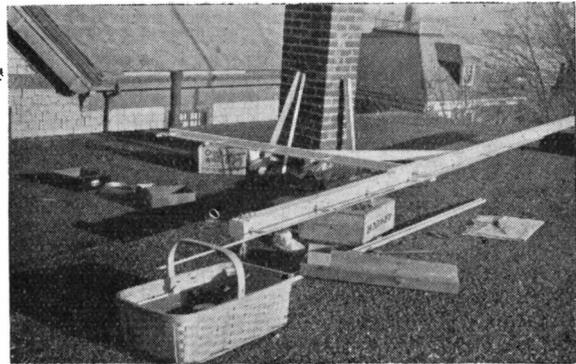
Band Spread—But No Amateur Bands

One of the main features of the new Rogers Majestic design is the incorporation of electrical band-spread—or "spread-band tuning," as they call it—on the short-wave ranges. These receivers are intended for high-fidelity broadcast reception only over 2000-750, 600-170 and 50-16 metres approximately, with tuned RF on all bands, a 465 kc IF, selectivity variable from 6 to 16 kc band-width, and motor-controlled tuning which can be de-clutched for manual operation.

That these sets should appeal to listeners interested to the exclusion of all else in short-wave broadcast reception is indicated by the fact that not only is the range 16-50 metres divided into no less than five bands, each spread over the whole dial, but what is more remarkable, no *amateur* bands are included!

There are many readers who, for different reasons, will welcome this, which to our knowledge is the first all-wave design yet produced which does not touch any one of the six amateur frequency ranges.

Prices of the Rogers Majestic receivers vary from 17½ to 100 guineas, and full details in an attractive catalogue are available from Messrs. R. M. Electric, Ltd., Majestic Works, Oaklands Road, London, N.W.2.



Puzzle Picture—What is it? Answer on page 24.

Goltone Catalogues

The interesting and well-produced Radio and Electrical Catalogues, listing a wide range of both proprietary and "Goltone" radio products and much in the way of wires and cables, are now available on request from Messrs. Ward and Goldstone, Ltd., Frederick Road, Pendleton, Manchester, 6. The aerial kits have proved a strong line, and readers will find these catalogues worth having.

Hungry for QSLs

W. H. Metcalfe, VU2EU, our Correspondent in India, remarked in a recent letter to the Office that he can't hang cards on his walls because the white ants eat them.

HAVE YOU HEARD . . . ?

*Compiled and Presented
by F. A. Beane, 2CUB*

To ME, in these days of long - distance listening, rapidly becoming commonplace and short-wave radio a household phrase, it is astonishing that there should still survive the "Doubting Thomas" of the type so prominent a few years ago before high-frequency reception captured the radio enthusiasts' interest en masse; yet I met one in the flesh quite recently! He enquired, in decidedly sceptical tones, whether I really log all the stations I mention! My reply was warmly given in the affirmative, although I explained most carefully that I do not receive *all* the transmissions reported by readers, and that much of my information is gathered direct from the station operators, in which case acknowledgment is made of the source of origin, and I make no claim to reception in such instances.

Personally, I consider this type of listener should devote more attention to reception, for it is invariably noticed that he persistently ridicules all talk of DX and considers the collecting of verifications a childish pastime. As he is generally the potential amateur transmitter he will one day find that a first-rate knowledge of reception, seasonal conditions, the best time to listen for certain zones, and so on, is as great an asset as the ability to converse freely in terms of "PA", "CO" and "Tritet." My advice, Mr. Doubting Thomas, is to devote just a little more time to reception and discover for yourself that the claims of the ardent DX'er are not concoctions of the imagination. Furthermore, the experience gained will be of value should you attain that full licence, for expert manipulation of the receiver is as important as complete control and understanding of the functioning of the transmitter. Even QSLs may have another significance then!

● ZNB, Mafeking

From James Timoney (Cape Town) I have received an interesting article taken from the "Cape Town Argus," a very radio-minded newspaper. The cutting concerns ZNB, Mafeking, the town made famous by the siege, operating on 50.84 m. Broadcasts are made nightly from 1800 to 1930, programmes consisting chiefly of request recordings, the opening call being "This is station ZNB calling from Mafeking, South Africa. Good evening everybody," and the announcer being a chemist by profession. ZNB is not primarily a broadcaster but the modern, dramatic GPO of the Kalahari Desert, on the edge of which it is situated. Reception reports are welcomed and verified by an attractive card bearing the crest of the Bechuanaland Protectorate.

● From the Log—Europe

Germany, ever anxious to increase the scope and efficiency of its short-wave service, has recently inaugurated transmissions over the following channels:—DJX, 31.01 m, 9,675 kc, and DJZ, 25.42 m, 11,801 kc, the former being used 1630-2125 and the latter 2150-0350. A DJY is on 49.4 m but I do

not know its schedule. Incidentally, I understand that a new and greatly improved verification is now being issued by these stations, vastly different from

the original letter verification in German, sent out many years ago. A DJX has been in service for some time on 13.99 m, 21,450 kc, 0500-1600.

From the Aktiebolaget Radiotjänst, Kungsgatan 8, Stockholm, comes the full schedules of their high-frequency transmitters; they are: SW5SX, Stockholm, 19.80 m, 15,155 kc, Monday to Fridays inclusive, 1600-2200, Saturdays 1600-2200, Sundays and holidays 1600-2200; SBP, Motala, 25.63 m, 11,705 kc, Mondays to Fridays 0620-0700, 1100-1400 and 1600-2115, Saturdays 0620-0700, 1100-2115, Sundays and holidays 0800-2115, Wednesday and Sunday mornings, for America, 0100-0200; SBO, Motala, 49.46 m, 6,065 kc, daily 2115-2200.

● Latest Polish Activities

The Listeners' Research Department of Polskie Radio, Mazowiecka 5, Warsaw, inform me that they welcome reports on the following and that each of these are verified separately. SPW, 13,635 kc, and SPD, 11,535 kc, aerial directed towards N. America, 2300-0200. SP19, 15,120 kc, and SP25, 11,740 kc, for S. America, schedule as for SPW-SPD. SP31, 9,525 kc, and SP48, 6,140 kc, non-directional, 2000-2230. All are situated at Babice, near the capital.

Other European items of interest. HVJ has been observed from 1900 until 1930 on an announced wavelength of 48.78 m, also on 49.75 m at the same time on other occasions. It is indeed a mystery why this station deserted its original interference-free channel of 50.26 m. Schwarzenberg, Berne, Switzerland, 31.46 m, 9,535 kc, now operates daily (except Sunday nights) 1800-1900, 2345-0045 and 0100-0200, according to Charles E. Sambrook (Cricklewood, N.W.2). LKC, Jeloy, Norway, has altered its frequency to approximately 9,550 kc, where it is now subject to the severe buffeting of DJN and DJA.

RR6, Radio Vitoria, Spain. Philip Trinder (Sudbury, Suffolk) states that this insurgent broadcaster verifies with an attractive card, giving transmitting hours as 0900-0930, news bulletin; 1300-1500, news and music; 1800-1830, music for wounded soldiers in hospitals; 1830-1845, news in French and English and 2100-2400, news and music. The "Radio Nacional de Espana" programme is relayed 1430-1500 and 2245-2330. Thomas P. Byrne also reports RR6 and a station of the "Radio Club de Tenerife" (EA8AB) on 19.6 m.

OFE, Lahti, Finland, 19.75 m, may be heard in the afternoons and has been announcing as "Lahti-Suomi" at 1545.

● Asia, Africa and Australia

The inception of broadcasts from the somewhat obscure, from the radio point of view, Iraq, has aroused considerable interest in this country since reception has been quite good up to the time of

writing. Those not familiar with this newcomer, whose call is stated to be YIJG, should listen from about 1830 in the vicinity of 41.7 m. Programmes are comprised exclusively of native music and brief announcements, and at 2000 an English announcement is made, including a very BBC'ish "Good-night, everybody. Good-night," and finally what is apparently the country's National Anthem. Reception is seldom free from interference but strength is often in the region of R7. A reader, H. W. Darvill, gives the frequency as approximately 7,100 kc.*

The same reader reports HS6PJ, 9,510 kc, between 1300 and 1500 on Thursdays, when it is receivable at good strength; also ZHP, 9,690 kc, daily, weak and severely QRM'd by Morse; JDY, 9,925 kc and states that VUM2, Madras, 4,950 kc, sends a letter verification in which they mention QSLs will be available later. JDY may be heard signing on at 1200, following with music and a talk or news, and at 1245 news in English, given by a male, concluding rather abruptly at 1300.

TAP, Ankara, Turkey, 31.70 m, 9,465 kc, may be heard from 1930 (or earlier) until close at 2200, or a few minutes earlier. Listeners should be careful not to be misled into mistaking this for a more "eastern" broadcaster during its evening transmissions of native music. Broadcasts are terminated by announcements in Turkish, French, English and German, and the National Anthem. TAQ, 15,190 kc, is still well heard between 1030 and 1200. *

Readers who have yet to log the elusive VK3ME, Melbourne, should take the present golden opportunity and listen on 9,500 kc at 0900, when reception is now possible. Accurate, detailed reports are confirmed with a card not unlike that of 2ME. H. W. Darvill states that the latter was on 9,475 kc one Sunday, a rather unusual departure.

CR7AA, 6,140 kc, and CR7BH, 11,720 kc, Lourenco Marques, are heard in the evening at poor to fair strength, according to Mr. Darvill, but I have not logged 7AA or heard 7BH for some time.

● North and Latin-America

Stations W3XAU and W2XE of the C.B.S. are combining services shortly so that programmes may be directed to South America and Europe simultaneously whenever desired. W3XAU is to have new directional aerials of the horizontal "V" type and when completed will act, it is claimed, in the same fashion as a huge searchlight, having the ability to direct energy at any desired location.

Two other items of interest are W1XK's rather astonishing change to C.B.S. programmes and W1XAL's transmissions on 14 m from 1600-1700, when programmes are derived from the Mutual Broadcasting System. No transmissions were made by W1XAL on Christmas Day.

Ultra-high frequency stations operated by the police are now using the WQ prefix, the best channel for their reception being 33.1 Mc (H. W. Darvill). Incidentally care should be taken not to confuse the "Q" with "2."

● News from Panama

An extremely interesting letter comes from Geo. Williams, Panama City, who is responsible for the English news broadcasts heard via HP5J (31.28 m), "The Voice of Panama," and HP5F, 49.34 m, "The Voice of Colon." His broadcast—"radio newspaper"—is to be heard from midnight to 0030, being

* [He must be a semi-amateur station, or he will not stay there long.—ED.]

heralded and concluded by the playing of a march. Mr. Williams is English and pays particular attention to his listeners in the Empire and I can vouch for his claim that "there is no other broadcast that carries so much news of the world" as his, in fact I have secured news of events taking place in England from this source many hours before reading of them in our morning newspapers! This station staged a listening contest during December but details arrived too late for publication. Mr. Williams is prepared to verify reception on the behalf of both stations, his address being P.O. Box 34, Panama City.

LRA, "Radio del Estado," Buenos Aires, continues to operate as shown in our schedules with the exception that the Friday programme of the Ministerio de Relaciones Exteriores (in various languages, including English) is now given over 17,380 kc instead of 9,690 kc.

A newcomer, on approximately 30.82 m, slightly higher in wavelength than CSW, is to be heard around midnight, or a little earlier. From announcements it appears that it is CB970, the slogan "La Voz de Chile" being prominent in announcements. The situation is understood to be Valparaiso and another title "Radio la Cooperativa Vitalica." CB1180, "Radio Sociedad Nacional de Agricultura" is still on 11,900 kc, the address Apartado 40 D, and situation Santiago.

Other items from South America. YV5RR, 5,835 kc, "Estudio Universe," relaying YV5RS, Caracas, is frequently well heard around midnight; no identification signals are employed but the use of male and female announcers is an outstanding characteristic. New stations, yet to be logged, are YV6RU, "Ecos del Orinoco," Bolivar, 4,880 kc, YV2RN, "La Voz de Tachira," San Cristobal, 4,870 kc and YV3RN, "Radio Barquisimeto," 4,820 kc, these being, of course, sister stations to YV6RB, YV2RA and YV3RD respectively. It is interesting to note that many Colombians are changing their calls, much to my horror, having spent many years in logging and deciphering their old ones! Examples are HJ3CAH, "La Voz de la Victor," formerly HJ3ABH, and HJ4ADB, formerly HJ4ABE. From the Dominican Republic good signals have been derived via HIIS, now announcing as "Radio RCA Victor, Santiago," and using a new frequency of 6,430 kc, HIN, "Broadcasting Nacional," 6,243 kc, and HIZ, 6,320 kc, with gong, call and long siren wail at 2345.

● Reader's Letter

F. Williamson, 2CJW Leigh, records HVJ on 48.47 m with a request for reports; VK3ME at 0830 (?) and HBO, 26.31 m, and HBQ, 44.94 m, at 1840.

● Programmes of interest

W1XAL's Modern Radio Course, conducted by Dr. C. Davis Belcher, is still on the air, and during January the following four lectures are to be given: "Radio Telegraph Transmitters" (Jan. 2), "Plate Modulation" (Jan. 9), "Grid Modulation" (Jan. 16) and "Radio Telephone Transmitters" (Jan. 23). All are to be broadcast on Tuesday mornings at 0100 on 49.67 m, and repeated, by means of recordings, the following Friday at 2200 on 25.45 m. The course, now in its fourth year, attracts hundreds of letters from appreciative amateurs each season.

A talk that promises to be interesting, is Tokio's "Festivals in Tokio," to be broadcast at 1945 on January 9, over JZJ and JZI.

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Makers of High Grade HAM GEAR AT REASONABLE PRICES

PREMIER 1939 HIGH FIDELITY AMPLIFIERS

A NEW COMPLETE RANGE OF 7 HIGH FIDELITY PA AMPLIFIERS FOR AC or AC/DC MAINS OPERATION.

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	Kit of Parts with Valves.	Completely Wired & Tested.		Kit of Parts with Valves.	Completely Wired & Tested.
3-watt AC Amplifier	40/-	£2 : 15 : 0	8-10-watt AC/DC Amplifier	£4 : 10 : 0	£5 : 5 : 0
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30-60-watt AC Amplifiers or Modulators, completely wired and tested, in Black Crackle steel case.

Power Pack in separate case to match

30-watt £12 : 12 : 0 complete. 60-watt £15 : 15 : 0 complete.

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Will match any modulator to any R.F. Secondary Load. Triodes, Tetrodes, and Pentodes Class A. Single or Push-Pull Class "AB1" and "B" In Push-Pull or 500 ohms line input, can easily be matched to any of the following Radio Frequency final stages requiring modulation.

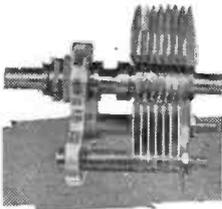
Triodes, Tetrodes or Pentodes operating under Class "A," "B," "BC" and "C" conditions either Single or Push-Pull.

Totally enclosed in cast case, with engraved Panel, and full instructions. Ratings based on R.F. inputs.

50 Watt, 17/6. 150 Watt, 29/6.
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A new range of "Matchmaker" Universal Output Transformers which are designed to match any output valves to any speaker impedance, are now ready.

5-7 Watt, 13/6. 10-15 Watt, 17/6.
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SHORT WAVE CONDENSERS

TROLITUL Insulation. Certified superior to ceramic. All-brass construction. Easily ganged.

15 m.mfd.	1/6	100 m.mfd.	2/-
25 m.mfd.	1/9	160 m.mfd.	2/3
40 m.mfd.	1/9	250 m.mfd.	2/6

All-brass slow-motion Condensers, 150 m.mfd.,

Tuning, 4/3; Reaction, 3/9.

Double-Spaced Transmitting Types.

15 m.mfd. 2/9 40 m.mfd. 3/6

160 m.mfd. 4/6

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AMERICAN VALVES

We hold the largest stocks of U.S.A. tubes in this country and are sole British Distributors for TRIAD High-Grade American Valves. All types in stock. Standard types, 5/6 each. All the new Metal-Case Octal Base tubes at 6/6 each, 210 and 250, 8/6 each.

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A.C. Types, A.C./H.I., A.C./L., A.C./S.G., A.C./V.M.S.G., A.C./H.P., A.C./V.H.P., A.C./P., and 1 watt D.H. Pentodes, all 4/6 each. A.C./Pens., I.H., 5/6; A.C./P.X.4, 6/6; Oct. Freq. changers, 8/6; Double Diode Triodes, 7/6; Triode Hex. Freq. Ch., 8/6; Tri. Grid. Pen., 10/6; 3 1/2 watt I.H. Triode, 7/6.

UNIVERSAL TYPES, 20 v.

.18 amps., S.G., Var-Mu., S.G., Power, H.F. Pen., Var.-Mu. H.F. Pen., 4/6 each.

13 v. .2 amps. gen. Purpose Triodes, 5/6; H. F. Pens. and Var.-Mu. H.F. Pens. Double Diode Triodes, Oct. Freq. Changers, 7/6 each. Full-Wave and Half-Wave Rectifiers, 5/9 each.

BATTERY VALVES, 2 volts,

H.F., L.F., 2/3. Power, Super-Power, 2/9. Var.-Mu.-S.G., 4-or-5-Pin Pentodes, H.F. Pens., V-Mu.-H.F. Pens., 5/- Class B, 5/- Freq. Changers, 7/6.

NEW TAYLOR TUBES

T.40. TZ.40. NOW IN STOCK. Price 24/- each. Prices

now reduced on 866 Rectifier, now 10/-; 866 Junior, 7/6; T55, 45/-; 203Z, 52/6; 745, 65/-; T.20 and TZ.20, 17/6 each.

PREMIER MOVING COIL METERS

Guaranteed Accuracy within + 2 per cent.

Model No. 2—Bakelite Case, 3 in., by 3 in. square, with Zero Adjuster.

0-500 Microamps	...	31/-
0-1 m.a.	...	25/-
0-10 m.a.	...	22/6
0-50 m.a.	...	22/6
0-100 m.a.	...	22/6
0-250 m.a.	...	22/6
0-1 m.a. movements with calibrated scale volts—ohms—m.a.	...	27/6

MODEL No. 21 MODEL No. 311.
3-in. square case, 3 1/2-in diameter round case.

0-1 m.A.	18/6	0-1 m/A.	22/6
0-10 m/A.	17/6	0-10 m/A.	20/-
0-50 m/A.	17/6	0-50 m/A.	20/-
0-100 m/A.	17/6	0-100 m/A.	20/-
0-250 m/A.	17/6	0-250 m/A.	20/-

MODEL 311. 0-1 m/A. movement, with calibrated scale, volts-ohms-m/A., 25/-.

VOLTAGE MULTIPLIER RESISTANCES, guaranteed accuracy + 2 per cent. All standard ranges, 1/3 each.

TAPPED SHUNT to provide readings of 5 m/A., 25 m/A., 250 m/A., and 1,000 m/A., 5/6.

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Are all sold complete to the last detail. All valves and coils are included as well as theoretical and wiring diagrams, and lucid instructions for building and working. Thousands are giving excellent results all over the world.

Each Kit uses plug-in Coils and the Coils supplied tune from 13 to 170 metres. All Kits are supplied with a steel chassis and Panel.

1 Valve Short-Wave Receiver or Adaptor Kit	17/6
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 165 & 165a, FLEET STREET, E.C.4 (Central 2833),

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Premier Mains Transformers.—

Screened primaries 200-250 volts.
 Fully Guaranteed. Wire end types.
S.P. 250. 250-250 v. 60 m/A. 4 v. 1-2 a.,
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 The above can be supplied Fitted with Panel
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 4 v. 2 3 a., 4 v. 2 3 a. 4 v. 3 5 a., all C.T., 25/-.
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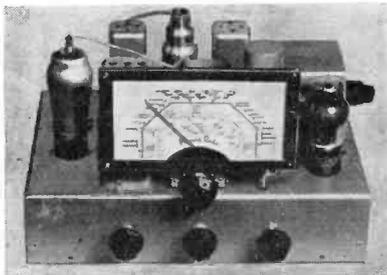
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60 m/A. 40 hy. 6/6 150 m/A. 40 hy. 11/6
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A 5-Valve All-wave Superhet Receiver chassis
 with moving coil Speaker. Wave-range 16-50, 200-
 560 and 800 2,000 metres. Output 4½ watts.
 Fully illuminated scale with Station Names and
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 Complete with valves and speaker ... **£6-6-0.**

A 6-Valve All-wave Superhet as above, but
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 With valves and speaker ... **£7-19-6.**

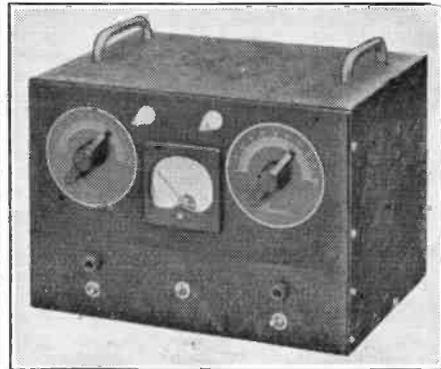
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All Primaries tapped 200-250
 volts. Between winding insu-
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2.5 v., 8 amps CT. ...	8/6
4 v., 5 " CT. ...	9/6
5 v., 3 " CT. ...	8/6
6 v., 2 " CT. ...	8/6
6.3 v., 3 " CT. ...	8/6
7.5 v., 3 " CT. ...	8/6
10 v., 3-4 " CT. ...	11/6
12 v., 4-5 " CT. ...	11/6
14 v., 4 " CT. ...	11/6
22 v., 1 " CT. ...	7/6

3,000 volt Test Type

2.5 v., 5a CT. ...	11/6
2.5 v., 10a CT. ...	12/6
10 v., 4a CT. ...	14/6



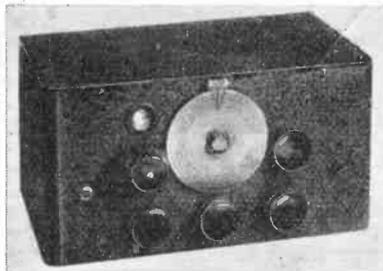
**The NEW PREMIER 10-15 WATT
 ALL-BAND TRANSMITTER**

Designed to meet the demand for a really compact
 self-contained T.X., which can be used for 'Phone
 or C.W. on all bands.

A 6L6 is used as a modulated oscillator in a Tritet
 circuit, allowing a fundamental and second harmonic
 operation, without coil changing, from any one Xtal.
 A 6C5 speech amplifier is R.C. coupled to a 6L6 modu-
 lator, giving approx. 9-1½ watts audio. A 400-
 volt power supply with generous smoothing gives
 completely hum-free output.

Housed in steel cabinet, in black crackle finish, 12 in.
 x 9 in. x 8 in.

Complete with Xtal and coils for 7 **£10-10-0**
 and 14 mc. operation ...
 Write for details of all Premier Transmitters.



**NEW PREMIER 1939 "5. v. 5" COMMUNICATION
 RECEIVER**

5-valve Superhet-covering 12-2,000 metres in 5 wave bands.

- Beat Frequency Oscillator
- 2-Speed Band-Spread Control
- A.V.C. Switch
- Send-Receive Switch
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- Over 4-watts Output
- Illuminated Band-Spread Dial

Provision for single wire or Di-gole Aerial. International Octal Valves for 200-250
 v. mains (AC). Built into Black Crackle Steel case providing complete screening.
 10½ in. Moving Coil Speaker in separate steel cabinet to match
 Receiver. Complete with all tubes and Speaker ... **£8-8-0**

The neutralising condenser C5 is an Eddy-stone, with a J.B. special (.0001 mF double-spaced S/W type) for C4. This is the larger variable condenser on the right. The PA tank coil L2 behind C4 is a standard Q.C.C. ten-watt type, with holder; note that L2 must be centre-tapped, and this should be specified when ordering. The RF choke is visible just alongside the valve, the fixed condensers being behind it.

The supply points are brought out to a very neat 10-way connector block, screwed to the back edge of the baseboard. These multi-way connectors are now available in various sizes from Short Wave Radio, Leeds, and being suitable for either wood or metal chassis, are most useful for a variety of purposes.

The transmitter as shown in the photograph is set up for 7 Mc. It can be used on other bands by changing the coil valves and crystal, and with either a 6A6 or RK.34, can be run to a comfortable and efficient 10 watts on the PA side. Plate voltage with either valve can be 400 maximum. A 6E6, which is pluggable with the 6A6, is a smaller valve, and is good for about 5 watts input at 250 volts. For battery working, a Hivac B.230 can be substituted, though the base connections and holder will have to be changed, and the cathode returns made to one side of filament. In all other respects, the circuit remains unaltered. A full 6 watts at 200 volts is possible with this valve.

● Another one

Having absorbed the first "two-in-one" idea, look at Fig. 2, V1 is a twin-triode used as a push-pull

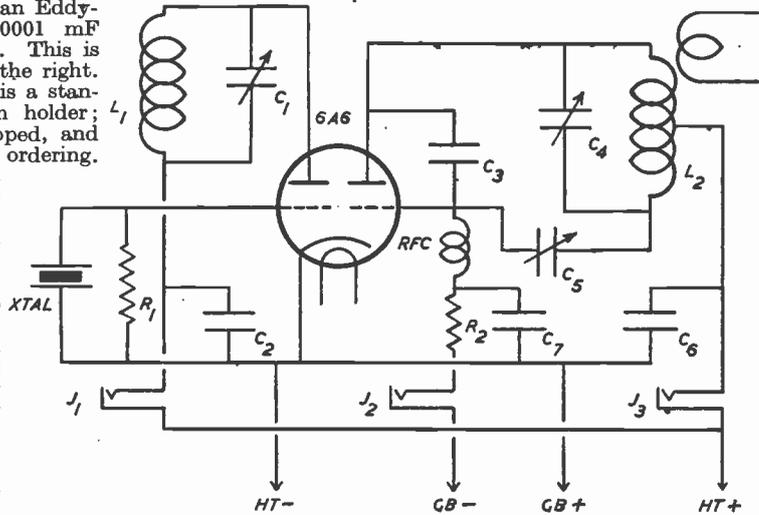


FIG. 1.

A 6A6 in a CO-PA circuit. Very compact and efficient portable apparatus can be built up along these lines.

crystal oscillator, followed by a second similar valve V2 working as a push-push doubler.

Again, there is nothing difficult about this, and the second stage could be operated as a push-pull straight-driven PA by connecting L2 across the plates of V2, centre-tapping, and then neutralising in the usual way. The tank end of the circuit would then be the same as that used for the 5-metre RK-34 PA described in our April and May issues.

The main value of the circuit of Fig. 2 is as an exciter for an RF amplifier running to 50 or 100 watts input. Good output is obtainable from hard-driven push-push doublers, and a push-pull CO en-

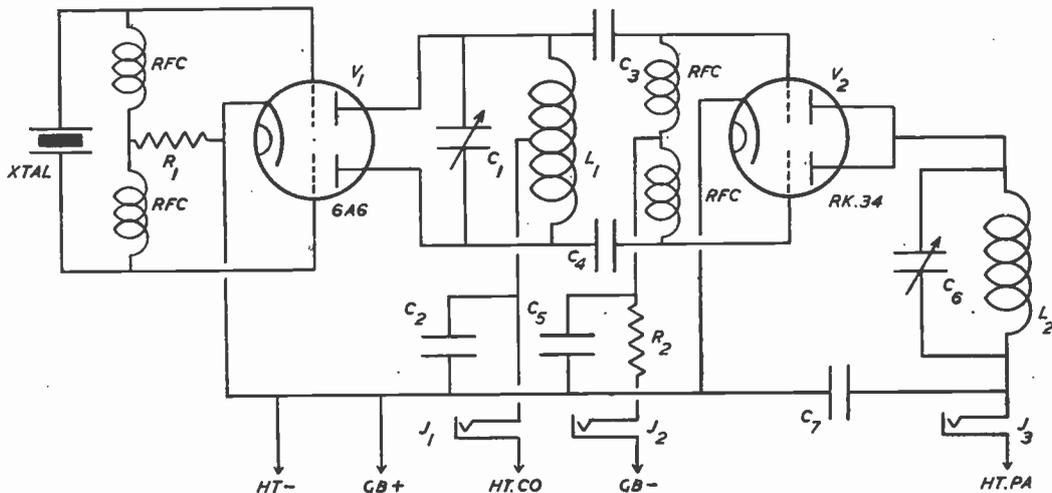


FIG. 2.

Using two twin-triodes for an exciter to give plenty of drive.

TWIN-TRIODE TRANSMITTERS

sures that the doubler will in its turn get plenty of excitation.

All values can be as given for Fig. 1, in the appropriate positions, though the four RF chokes require a word of explanation. They are likely to cause peculiar self-oscillating effects if they are not dissimilar, i.e., it would be asking for trouble to put four chokes of the same make and type in those positions. Those on the CO side might be dispensed with and resistors substituted, but this will in most cases reduce CO output. The best thing is to use different chokes, and check over the whole circuit for self-oscillation. If there is a tendency for this, alter the value of C5.

As before, keying can be in either of the three jacks, but J3 is the best place. For frequencies below 14 Mc, 6A6's will work very well—and they are cheap. The TVO3-10 is, however, better than the 6A6 on all frequencies, and the improvement it shows will be most noticeable on 14 and 28 Mc. The TVO3-10 has its anodes brought out to horns at the top of the envelope, whereas the 6A6 has all connections at the bottom, and is not available with a specially low-loss base. That of the RK.34 is ceramic.

A little thought will suggest a number of other circuit combinations which will multiply stages while keeping the number of valves down.

56 Mc Permits

An impression is about that some restriction has been placed on the issue of transmitting licences for 5 metres. This is not correct, except that, as always, 56 Mc permits are not usually granted to operators without previous experience on the other bands. All new 5-metre licences are for the frequency range 58.5 to 60 Mc, thus in effect widening the used frequency range, as those already holding the 56 to 60 Mc permit are not affected.

McElroy again

He goes in for the International Code Contest on November 21, 1938, and maintains a receiving speed of 75 words a minute, without error, for five minutes. Phew! We shall be content to plod along at our usual steady 45-50 w.p.m., hoping no one will notice the crawl.

New Books

Those of amateur interest now available include the Admiralty Handbook of Wireless Telegraphy, in two volumes at 10s. nett (H.M. Stationery Office), the Amateur Radio Handbook, 3s. post free (R.S.G.B.) and the Radio Amateur's Handbook, 1939 edition, price 5s. 6d. post free (The Ham's Bookshop). Extended reviews of these three publications will appear in our February issue.

Puzzle Picture

The photograph on page 17 shows W1BB's 56 Mc Johnson-Q in course of construction, illustrated in its final form on page 9.

Conditions—The Month's Survey

How does your log compare?

SHORT-WAVE CONDITIONS this month have generally been of the normal winter type. This is characterised by exceptionally high ionisation of the layers during the day, with a very rapid fall in density at sunset. This results in good propagation of very high frequencies during daylight, the optimum frequency generally being in the region of 9 Mc by about 2200 GMT. Around November 28 the daytime ionisation level showed signs of a fall, which is a normal mid-winter effect and has continued. This means that the maximum daytime frequencies will not be quite so high until after about mid December, when daytime ionisation should increase again. Now for the day to day variations.

During the early part of the period, solar activity was low and rather poor conditions prevailed, with flutter fading prevalent after dark. November 17 was a particularly poor day, but on November 19 an improvement occurred. American signals on the 14 Mc band were very strong in the evening and 11 Mc was the optimum frequency at 2230 GMT. On November 21 there was a minor *magnetic* storm and conditions deteriorated again, though South American broadcasters were still well received. However, on November 22, reception was very poor on all stations after dark. Conditions remained below normal until November 26.

On November 27 an improvement occurred, 26 Mc Americans being R4 in the early evening, 14 Mc Americans strong during the afternoon and evening, W2XE on 11 Mc the best signal at 2300 GMT, and LRX on 9 Mc a really good signal. This improvement was possibly due to the presence of a large sunspot group *before* the central meridian. Its area on this day was 1950-millionths of the visible hemisphere and it crossed the meridian on November 28. No marked ionosphere storm followed, though a deterioration did occur on December 3.

● An Ionosphere Storm

On December 4 an active sunspot came over the sun's east limb and conditions improved again. For the next few days good reception on all appropriate frequencies was obtained, W9XUP on 25.95 Mc being exceptionally strong on December 8.

This sunspot made its C.M.P. (central meridian passage) on December 7 and on December 10 a *magnetic* storm and also an ionosphere disturbance occurred. The former started at 1500 GMT and lasted till midnight, with moderate variations in the magnetic elements. As regards the ionosphere storm, the 21 Mc American broadcasters faded out at 1500 GMT, followed by the 17 and 15 Mc stations shortly after. Though the 11 Mc stations were still audible late in the evening, they were completely spoilt by flutter fading, which, in fact, covered all short-wave bands.

On December 11 conditions were back again to normal and the American 14 Mc amateurs were very active at 2000 GMT. Since that date, sunspot activity has increased and conditions have generally been good for the time of year, though somewhat variable after dark.

TRANSATLANTIC—The February 1.7 Mc Tests

ARRANGEMENTS FOR the 1.7 Mc DX Tests are now practically complete, and we give below the date, time and frequency schedule which has been agreed with the States.

DATES AND TIMES

February 4, 6, 8, 10, 12, 14, 16.
0430 to 0730 GMT each day.

CALLING AND LISTENING SCHEDULE

0430-0440 W calls, Europe listens.
0440-0450 Europe calls, W listens.
0450-0500 W calls, Europe listens.

(And so on at ten-minute intervals till 0730 GMT).

“Europe” of course includes G stations, all of whom should operate between 1720-1800 kc, in order to keep out of the American 'phone band, through which DX working is impossible for East Coast W's. By the same token, listeners on this side should log many 1.7 Mc DX 'phones, and there may be opportunities for telephony QSOs.

The schedule should be adhered to as closely as possible in the interests of all concerned, as only thus will needless QRM be avoided. Accurate time-keeping is essential, and only on a DX QSO being made should the routine be broken; even then, the contact should be kept as short as possible, to give others an opportunity to get across while conditions are right—which will probably be for a short period of not more than 1½ hours or so.

● Overseas Co-operation

Stewart Perry, W1BB of Winthrop, Mass., is once again our right-hand man on the American side, and we have no doubt that his signals will come across as well and as consistently as they did last year. The schedule shown above is appearing in “QST” and other American papers, as well as in the journals of all European countries whose amateurs are licensed for 1.7 Mc working. Furthermore, in our announcement to the European societies, we have asked them to give publicity to the fact that many G stations will be on during the evenings of the Test Period, which will give the best opportunity for 1.7 Mc operators in this country to work the Continent.

● Reports

All reports from receiving and transmitting stations, even if negative, should reach this Office as soon as possible after February 16, so that a preliminary account of results can appear in the March issue, for which purpose our own station will be on watch throughout the Tests. The full story will be published in April, wherein credit will be given for every receiving and transmitting report sent in. These should give details of stations heard or worked, the equipment used and, where possible, good clear photographs.

It only remains for us to wish all participants the best of luck . . . and we'll be seeing you on the (chilly) morning of February 4, at 0430 GMT.

3.5 Mc DX Again December Working from G6WY

A SERIOUS ATTEMPT was made to work some DX on this band, starting from the beginning of December 1938. By previous arrangement on 28 Mc with VU2AN, a 3620 kc crystal was sent him by air mail, and a schedule made for each Saturday evening at 2300 GMT. On December 2 the first contact took place immediately on receipt of the crystal, VU2AN being RST-449 at 2305 until 2345, when he started to fade; the report obtained by G6WY was RST-579. The schedule arranged for 2300 GMT every Saturday is now in force.

On December 4, ZL4GY was worked, RST-569 on 3575 kc; a schedule made for 0745 GMT resulted in three contacts during that week, and G2MI was put through for his first ZL on this band. W1-3 and W8 were also QSO'd from G6WY during December, and regular activity is being maintained on 3570 or 3620 kc, with a schedule at 0630 GMT every Saturday morning with W5EHM—this pro-

duced an RST-129 signal from him on December 17, but no QSO up to the time of writing. 7 Mc CW and 28 Mc 'phone are being used for keeping touch.

● The Possibilities

Five continents have now been worked on 80 metres: VK, ZL, W1-4, W8-9, VE1-3, and FA, with a report from W7. An endeavour is being made to get a South American on the band for WAC. During the last American DX Contest signals from Cuba, Mexico, Porto Rico and the Canal Zone were heard at good strength, indicating that greater activity on 3.5 Mc should produce many real long-distance QSOs.

The input at G6WY is 180-200 watts into a half-wave aerial, end fed, with a Mullard T61D in the final stage. It is interesting to record that VU2AN used exactly 10 watts.

Congratulations, both!

Mention the Magazine when writing to Advertisers. It helps you, helps them and helps us

HF Feeder Lines

Some Observations and Experiments

ALL THOSE interested in transmission on 56 and 28 Mc will know that obtaining drive into the final stage on these frequencies is often no easy matter, even if there is plenty of RF available at the doubler or buffer tank.

Some recent tests when setting up a 50-watt PA on 56 Mc gave particular point to this; to our alarm, we could only get a couple of mA grid drive into the final from an exceptionally efficient buffer running at 25 watts input on load and showing some 10-12 watts of RF output. It was then discovered that the 15-ins. of twin-flex used for the link-coupling was quite warm to the touch and it was obvious that this link, with its two ends closed by the single-turn loops, was loading up on its own account.

After trying different lengths and types of link-line, it was found that best results were obtained by putting two equal lengths of single rubber-covered flex side by side and binding them loosely together such that they lay parallel; either cotton or string can be used for the binding, though in our case it was the artificial silk sleeving stripped from the original piece of flex.

The improvement obtained with this link-line as finally evolved—and it could probably be made still better by using thinly insulated wire of heavier gauge—is shown by the fact that the grid drive to the final went up to 32 mA and the buffer input down to 16 watts. . . . And it matters quite a lot *which way round* the link is connected.

● 56 Mc Aerial Feeders

As many people are using centre-fed aerials on 5 metres with long twisted-flex feeder-lines, arising from the above notes we carried out some tests to see how it all worked out on the aerial side. An adjustable 5-metre doublet was strung up indoors, such that 18 feet of feeder was required to couple it to the transmitter, and the aerial arranged to resonate as nearly as possible at the working frequency; "as nearly as possible" because it was found that the resonance peak was very much

flatter than one had been led to expect, and at the given frequency, quite considerable alterations in the length of the two arms (up to 2-ins.) had to be made before there was any noticeable change in the reading of a thermo-ammeter hung across the centre insulator, or in the glow from a couple of small neons attached to the ends of the aerial.

The expectation of finding serious deficiencies and losses when using ordinary flex as the feeder was not disappointed. Actually, with everything under control and the whole set-up visible and within easy reach, it was extremely difficult to get anything like satisfactory RF indication on the aerial, in view of the amount available at the tank of the transmitter PA stage—at least 30 watts on full load.

The flex feeder again showed signs of warming, and two of the cheaper types of commercial HF cable gave scarcely better results. Finally, the twin-flex line was unravelled, all the insulation except the actual rubber covering stripped off, and the two resulting lengths laid parallel and held loosely together, as before.

The increase in efficiency all round was remarkable; whereas previously only a glow could be obtained at the ends of the aerial, the neons now lit brilliantly, while the ammeter reading at the centre was practically double. The PA loading was decreased, and with full power, the amount of RF indicated on the aerial was much greater than anything obtained previously.

These results are by no means final—they only suggest the directions in which improvement is possible. They certainly show that hanging out a doublet and assuming a high transfer efficiency because the system "loads up well" is in most cases likely to be fallacious and misleading, and it is probable that few long feeder lines of the simpler types are delivering much RF to the aerial itself on 56 Mc.

Conversely, what applies to this particular transmission problem also goes for the reception side.

MORE POISONALITIES . . .

THE INVENTOR who yooops with an ECC, thinks there are long, medium and short dits and dahs, ignores the Q code and indicates an error by a nervous string of dits.

* * * * *

THE VOICE that employs "Hi!", "Take it away," "K", "Come in someone," "It's yours", and other gems from the diddledahbumdidit vocabulary.

* * * * *

THE ECONOMIST who modulates an oscillator, discards a monitor, and believes all the reports that he is *definitely* not over-modulated.

* * * * *

THE FIST that substitutes NST or TEV for "Test," calls for 15 minutes at S9 and then signs once in QSB.

THE LEARNER who thinks good sending is much easier than receiving, sends faster than he can receive and promptly faints when an ex-commercial replies at 30 w.p.m.

* * * * *

THE ANIMATED SODA-WATER SYPHON who adds continental spitch to bands already flavoured with pseudo Trans-Atlantic racketeers' accents.

* * * * *

THE EXPLORER who adventures into the commercial bands and the commercial who wanders on to amateur frequencies.

* * * * *

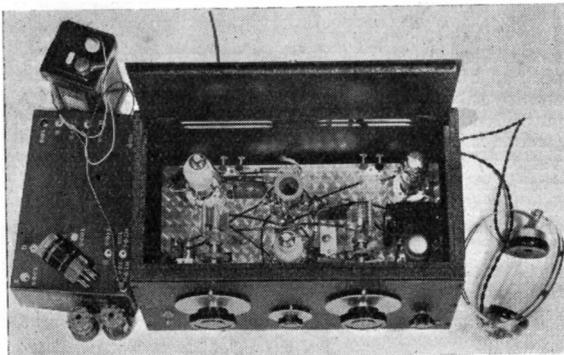
THE BUSY MAN who can operate duplex 'phone for hours but begrudges a few minutes for a personal ragchew.

A Kit Set Reviewed

*Four Valves, 8½ mA — 10 to 2000 Metres with ample
Bandspread over the Amateur Ranges—Automatic Bias*

MOST READERS of our pages know one at least of the past issues of the Eddystone Manual,* so that a general review of No. 4 is unnecessary if we say that this season's is a worthy successor, well up to the standard expected of Messrs. Stratton and Co.

Among the fourteen chapters—dealing with the construction of a resonance indicator, key-click eliminator, field-strength indicator, absorption wave-meter, power supply unit, cathode-ray oscilloscope, SW pre-selector, ultra SW receiver, two- and four-valve receivers, miniature amateur station, 25-watt transmitter, USW aerial systems, and a new communication receiver—is the ever-popular battery "Everyman Four," in a new form which we have



An Eddystone "Everyman Four" complete. The three dials are respectively bandset, reaction and bandspread. Points worth noting are good control with accessibility for coil changing from the top.

followed in detail according to Eddystone instructions, for test under SHORT-WAVE MAGAZINE conditions.

● Circuit arrangement

DX possibilities have already been independently proved in our "DX Corner," thus we may devote attention here to circuit, construction and general handling. The scheme of things is an untuned RF stage, SG detector, and two LF triodes (Osram

* "The Eddystone Short-Wave Manual," No. 4, 1s. 2d., Stratton and Co., Ltd., Bromsgrove Street, Birmingham, 5.

Z21's, Hivac H210 and P220). The first valve takes care of blind spots or a swaying aerial and generally assists a high degree of stability in the detector, where reaction is controlled by HT variation of a potentiometer feed to the screen grid. This method is brought to final balance by using a small trimmer condenser in series with the reaction winding, which once (easily) set may be forgotten.

On the audio side, the first step is a resistance-coupled stage with a volume control at the grid; the output from this being transformer-fed to another triode—both valves have automatic bias. Total HT consumption in our case is 8.5 mA at 145 volts from the "Drydex" battery seen in the photograph which, by the way, has letters as well as the printed voltage ratings; these make for certain up or down variations. If a plug happens to be in say "R" then "S" is the next higher socket. Whilst dealing with such accessories, our tests were with Ericsson 4,000-ohm headphones which match the output stage very well, and an Exide "DFG" accumulator is recommended for LT supply.

● Possible modifications

There are one or two easily made modifications that would, we think, still further improve the performance of a very good untuned RF-SG det-2 LF design, such as the addition of a speaker-phone switch and a coupling for doublet aerial. But our preference may not be yours; the general arrangement is quite satisfactory and can easily be altered in detail, as for instance conversion to a tuned RF stage.

Reaction, bandspread, volume control, each are a pleasure to handle. And so they should, for as well as the name "Eddystone" appearing on most of the component cartons the design is not allowed to tail off by the use of parts less well known. There is a Ferranti AF4 transformer; Bulgin switch, trimmer, valve caps and cables; Lab resistors; TCC and Dubilier condensers; Dubilier potentiometers. The baseboard is made by using a thin sheet of "Parex" aluminium fastened to a wooden board, a flange bent over the front edge of the shelf forming an earth connection to the panel.

To sum up, we have here a receiver in a class by itself in simple straight-circuit design, involving the very minimum of running expense, and capable of modification to any reasonable extent without marring the symmetry of the panel, which is an asset where a crackle-finished cabinet is used.

"The Short-Wave Magazine" circulates throughout the World

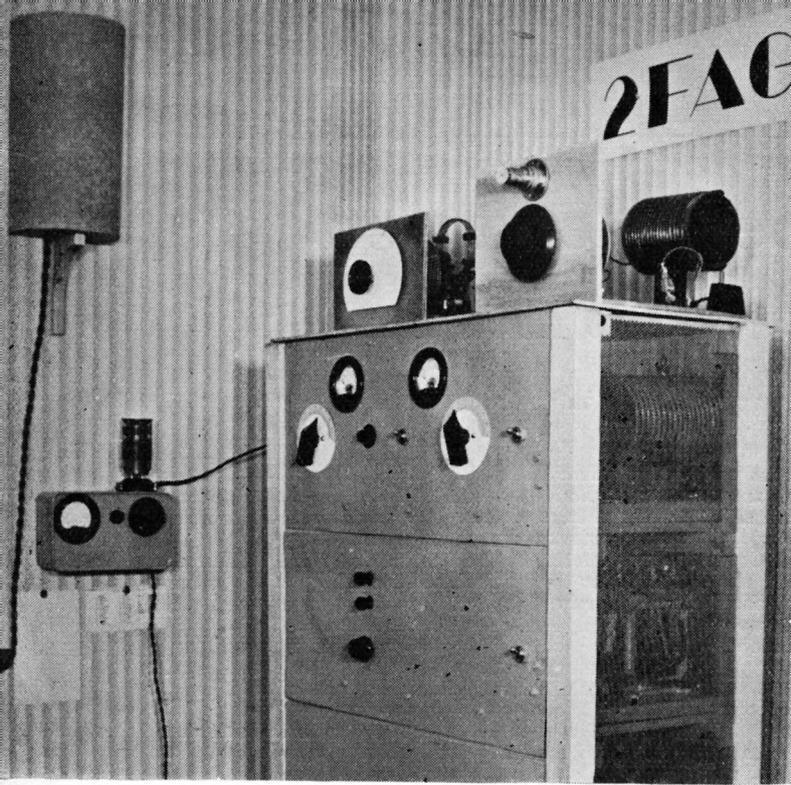
Experimental Station 2FAG

An interesting AA Rig.

By

C. R. Greenland

The very business-like AA set-up at 2FAG, C. R. Greenland, Westbury, Wilts. The monitor is on the wall to the left, and the artificial aerial on top of the cabinet.



THE ARTIFICIAL AERIAL transmitter to be described was built with a view to keeping the cost as low as possible consistent with efficiency and flexibility. The circuit is a one-valve tritet which can be worked on the 80, 40, 20 and 10 metre bands if crystals are available. Although designed primarily for CW operation, suppressor-grid modulated 'phone can be used; with a "362" RFP.15 valve, an input of considerably more than the necessary 10 watts can be obtained with 500 volts on the plate.

The transmitter is housed in a wooden rack, each chassis being built of sheet tin, bent to size and shape and then coated with grey enamel. The various parts—transmitter, modulator, or power supply—can thus be taken out for alteration or adjustment with the minimum of trouble, and the result is a workmanlike job, although costing only a few shillings.

● Transmitter

The top chassis contains the transmitter proper, and is divided into two sections by a screen, which also supports the valve-holder. On the left of the screen are the crystal, cathode coils and condenser; on the right, the tank coil and condenser, voltage dropping resistances, etc., and the switch for changing from CW to 'phone. It is only necessary to plug in the required crystal and alter the tappings on the cathode and tank coils to change to another band. The second harmonic is used except on 80 metres, the cathode coils being tuned to the fundamental and the tank coil to the harmonic, the latter being checked by means of an absorption wave-meter. Keying is effected in the centre-tap of the filament winding.

● Modulator

The modulator is actually the LF part of an old mains set adapted for the purpose by the addition of various by-pass condensers and resistances. The

two stages are sufficient when using a carbon microphone, but lately a moving-coil speaker has been employed as a microphone; this necessitates extra amplification, and the LF valve in the receiver (which is battery operated) has been utilized for this purpose, arrangements having been made to switch over the speaker from the output to the input of the last stage. The speaker thus acts as microphone or reproducer.

A separate power unit was incorporated with the modulator, as this was available at the time, but a tapping could of course be taken from the main power pack.

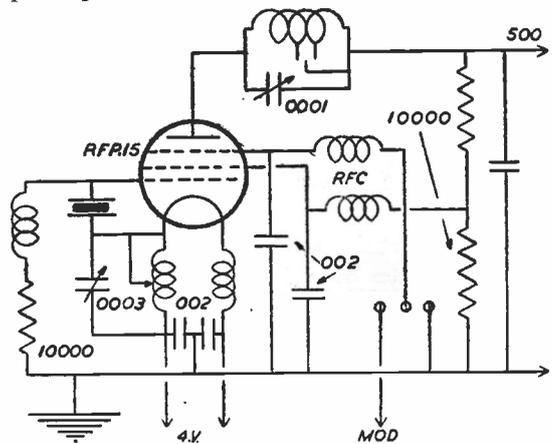


FIG. 1.

Circuit of the Tritet transmitter at 2FAG. Note the filament chokes for the RFP.15. A tapped tank coil is used, and the screen voltage taken from a potentiometer bleeding the HT supply. Modulation is applied to the sup. grid of the RFP.15.

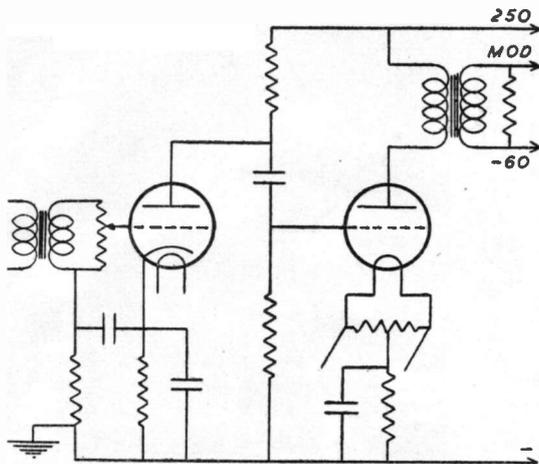


FIG. 2.

The speech amplifier-modulator used with the RFP.15 transmitter. A negative bias of -60 volts is applied to the sup. grid for 'phone working'. The values in the resistor-condenser network in the amplifier depend largely on the valves used, but the resistance across the output of the modulation transformer can be 10,000 ohms in most cases.

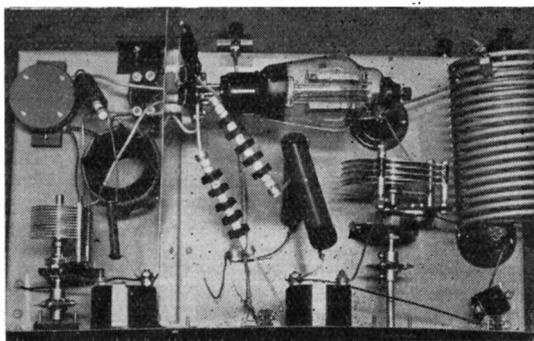
● Power Supply and AA

This is quite straightforward and gives an output of 120 mA at 500 volts, which allows for any reasonable expansion in the transmitter. A dial-light is wired across a spare LF winding to give warning when the power is on and prevent the possibility of a fairly considerable shock!

Consisting of a 6-volt 3-watt side-lamp bulb in series with a coil and condenser similar to the tank circuit, the artificial aerial can take almost the whole of the power from the transmitter. It is link-coupled to the latter, two or three turns of insulated wire being placed around the centre of the tank inductance and also the AA coil, the ends being connected together with flex.

● Field-Strength Meter and Monitor

This has been of immense value in carrying out various experiments with the transmitter, and it will



Layout of the RFP.15 tritron transmitter at 2FAG. The circuit is given in Fig. 1.

give an indication of the radiated power, quality or over-modulation. In fact, it has been found easier to tune up the transmitter using the F/S meter alone, adjusting for the highest reading. If, therefore, a good quality milliammeter is incorporated in

Circuit of the field-strength meter-monitor mentioned in the text. Only a foot or two of aerial is required, and the circuit should tune to the transmitter frequency.

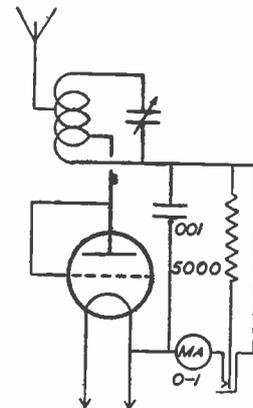


FIG. 3.

the monitor, it is almost possible to dispense with meters in the transmitter itself, or at least to use the cheaper types.

EDITORIAL NOTE.—While 2FAG's equipment, as illustrated and briefly described here, is a neat and efficient-looking layout which is not only a credit to him but will also give many readers useful ideas in planning their own stations, there are one or two points which we might profitably discuss.

In the first place, tapping the tank coil in order to change bands is fundamentally unsound, because it can only introduce losses likely to be serious with low power. This method of band-changing will undoubtedly work, but there are dead-end effects to be considered, to say nothing of the practical difficulty of getting a really tight connection at the tap. That is to say, while the end connections of a coil can always be made well, it is a different matter when clips are used to carry RF. In any case, it is not advisable to tap the coil for more than two bands.

● Pentode Screen Supply

Like all RF pentodes, the relation between plate and screen voltage is very critical in the RFP.15, and it is most important to have some form of variable HT control for the screen-grid, so that the correct value can be obtained at the working plate voltage. No measurements or calculations are required; it is only necessary to adjust the screen-voltage potentiometer until maximum RF output is obtained with normal loading of the tank circuit. This would be indicated in the AA lamp or—in 2FAG's case—on his field-strength meter.

As regards tritron operation with a directly-heated valve, care must be taken to ensure that the filament chokes do not resonate just outside the bands used, or there will be a tendency for oscillation off the crystal frequency.

Listeners' DX Corner

By The DX Scribe

A HAPPY NEW YEAR to all short-wave listeners and our thanks for your interest in and support of this Corner during 1938. It is our object to go on improving this feature, and we can only do so with your continued support and suggestions. Carry on SWLs—another year of better listening to you, with your Scribe here to do all he can to help.

● Conditions

The old year gave us some interesting reception in December, but on the whole the 7, 14 and 28 Mc bands were poor, although we have received some very excellent logs. 28 Mc was really good sometimes, but it never remained so for more than one day at a stretch, whereas 14 Mc faded out very early—much earlier than December 1937. 7 Mc is producing some good CW DX in the early mornings, but it is not expected that this band will be at its best until the end of January. Don't overlook 3.5 Mc either; January, February and March are the months for this band.*

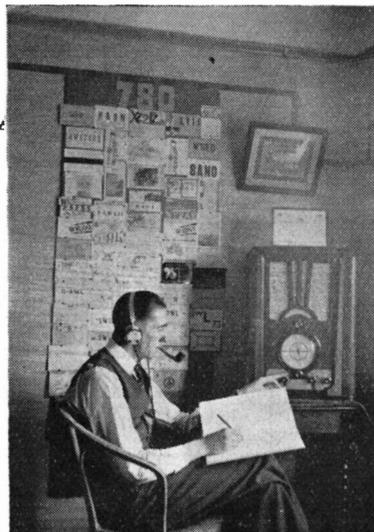
● A True Funny Story

Before getting down to more serious business we are indebted to Gordon Lane of Coventry for the following: "One day I paid a visit to my favourite junk shop and found the proprietor had left his wife in charge. I noticed that he had invested in a valve-testing apparatus. Turning to the lady I said, 'I see he's bought a new valve tester.' 'Yes,' she replied, 'but it's a second-hand one and won't test those new valves with the optical bases.'"

● QSLs Received

E. Trowell, 27 Unity Street, Sheerness, Kent, from CO6OM, LU4CZ, and W6FK who says he only works on CW; it is therefore believed that this call should be K6FKK. K. Holyland of Harrogate from YV1AP, HC1JW, ZS1K, VE4BF, VE5PE, SU1AX and W7GBI. Gilbert Reed of Abingdon, Berks. from KA1BH, PK1ZZ, K6OQE and W9EOZ. R. D. (Bob) Everard from VE4ALM (10 watts), W9UXI (Col.), and ZS1BO. Con. Tilly, of Bristol, from VK5SW, 3OI, 2NS, 4JP, 2TO, FA8LP (7 Mc), PY1HX, PK3WI, 2AY, 4JD, VR6AY, PY1GU, 2JC, 2CK, F18AC, VU2FU, 2FZ, VE4WJ, VP1BA and VP7NS. Conrad queries a 'phone heard on HF end of 14 Mc sounding like VP1A—this should read HP1A on 14330 kc. C. A. Betts, 19 Wychall Lane, Birmingham, 30, from W5BMM, 5YF, 5FKQ, 6HKQ, 6MWD, 6PER, NY2AE (postage must be sent), LU1HI, VP3THE, VP6TR, VR6AY, T12FG and VE5OT. W. R. Joss, 22 Beauford Gardens, Hendon, London, N.W. from VK2ACL, 2NQ, 3WA, 3TZ, 4JC, XE2FC, YL2BZ, YM4AS, OH3OI, VE4BB, ZS6BZ, VE5EF, ES6E and EI9D on 3.5 Mc.

* [The DX is already here on 3.5 Mc. See elsewhere in this issue.—ED.].



Judging by appearances, S. J. Mitchell, "Whindale," 32, Biggin Hall Crescent, Coventry, really takes his coat off to the job of short-wave listening. He is a member of B.S.W.L. (No. 780) and W.F.S.R.A.

● Albania

ZA1CC, ZA1CK, etc., are reported by many, and it is interesting to know from Desmond R. Hill, 81 Rye Hill Park, Peckham Rye, S.E.15, that he overheard W1KKP explaining to G5ML that he occasionally uses "ZA—" when he wanted some "fun," but although tricks of this kind (which are scarcely to be commended) may lead many to believe they have received Albania, we feel confident that it does not clear the mystery of the ZA's we log,—they are definitely European signals and have never QSL'd any station worked. The American radio journals frequently mention "ZA's" that have never been heard in Europe, showing that they have their own pet pirates with whom to contend, and we are so certain that "ZA's" reported by our readers are bogus that we will give a year's free subscription to any SWL who can produce evidence that those "Albanians" so far heard are really in Albania! We have said before, and we repeat, that the most likely country in which to look for them is Italy, the next-door neighbour, where no licences are granted.

E. Trowell of Sheerness asks if we know anything of "HP9ZW," but we think this should be HB9CW. P. Sawyer, 100a, Northend, Croydon, Surrey, received TA1KA on the HF end of 14 and points out that with 1AA and 3JD this call makes the third active TA. Philip Shaw of Peterborough also received TA3JD ('phone) and we should be very interested indeed to know if a verification is received from Turkey. P. Sawyer is anxious to correspond with a 56 Mc enthusiast, as he is ready to start listening on this band and asks for the call of a local active amateur—listen for G6VA. He wants to know why W stations are to be heard in December between 1100 and 1400 GMT. The reason is that conditions at this time approximate to summer conditions between 1800-2000 GMT as far as daylight and its effect on the "F2" Appleton layer is concerned. On CW he reports OQ5AQ, ZE's,

VQ2MI, ZS's, 25 ZL's and 14 VK's and has become a confirmed code man. Philip Shaw is wondering why we do not hear more countries (other than U.S.A.) on 28 Mc 'phone. The reason is simply that they do not operate on this band, being content with 14 Mc 'phone. A certain degree of technical ability is required to make a transmitter perform as satisfactorily on 28 as on 14 Mc, and many amateurs do not appear to possess the knack.

● **Welcome U.S.A.**

We are very glad to introduce some readers from the United States, that home of SWLs. Willard Parker, 5322 Tremont Street, Dallas, Texas, is unable to find anyone in the middle west who will accept his challenge to hear more DX and receive more QSLs than he does. Willard, we have our expert right here in England—Bob Everard—he'll give you a run. However, Willard has received 75 countries on 'phone, and has over 2,000 cards; his receiver is a Hallicrafter Sky Challenger with various aeriels. LeRoy Waite, 39 Hannum Street, Ballston Spa, N.Y., asks why he doesn't hear G3's on 28 Mc. The reason is that it is not customary for newly-licensed British stations to be granted permission to operate on this frequency until they have had some experience on 7 and 14 Mc. LeRoy asks if we will make it clearer whether a reported station was heard on CW or 'phone and, answering his query, OX7OU uses CW only. We think it true to say that a greater percentage of British SWLs read the code than do our American cousins; we will try and indicate in future whether reported reception was for 'phone or CW.

● **The Dominions**

We have two letters from George Downer of Homebush, N.S.W., whose list of calls heard appears on the appropriate page. He sets us some problems. He heard 1IGW "located in Italy" and wonders if this signal really emanated from that country. As previously stated, Italian stations are quite genuine, but operate strictly under cover; they all belong to a national society which caters for their interests. George heard "UH6G" on 7 Mc CW and asks us all about it, but we can only suggest that this was a pirate or a misread call from a Russian amateur, especially as the note was rough. He has mustered 58 countries in four months and points out to the British experts that his nearest country (ZL) is 1,200 miles away. He also raises the point about "country counting." We count Tasmania, Papua, New Guinea, separate from the rest of VK, and U.S.A. as one country. England, Scotland, Wales, I. of Man, Channel Islands, Northern Ireland and Eire all count individually, in the British Isles.

From India we hear that Wm. Metcalfe, VU2EU, is now using 'phone as well as CW on 14,380 and 28,760 kc; all reports will be acknowledged by Air Mail if an IRC is enclosed, and by Sea Mail if no postage is prepaid. We regret that his call appeared as VU2EC in the October Corner.

● **An Apology**

In the same Corner we said that the "Zone Map" showing the 40 Radio Zones could be obtained from Radio, Ltd., of Los Angeles, California by sending two IRC's. We are very sorry that we made this mistake as the number of coupons required is five, or a British P.O. for 1s. We apologise to readers who may have been inconvenienced by our incorrect announcement.

Gilbert Reed, 33 Caldecott Gardens, Abingdon, Berks, asks for details of VR6AY's transmissions. These are on 14,330 kc; he is usually there about 0800 GMT on Sundays working W2IXY. Owing to power difficulties and petrol shortage, he has not been heard working many amateurs. Gilbert takes great pains to make his QSL reports as comprehensive as possible and adds a few personal remarks, always enclosing coupons. He is anxious to see a "black list" published of stations who do not QSL and sends us his lot, but we are not in favour of this as it so frequently happens that a card will arrive long after we have given up all hope; furthermore, others may be more fortunate—there are very few amateurs who do not actually QSL at all. Gilbert is to be congratulated on learning the Morse alphabet backwards in two weeks, as the "CW bug" bit him suddenly. Geo. Owen, 5 Clovelly Court, Upminster Road, Hornchurch, Essex sends us a sample report sheet which includes every possible detail ever recommended in the Corner, plus a sticky label with his QRA typed thereon. He asks whether the code for fading and atmospherics recently given in one of our contemporaries is ever used by amateurs. We can truthfully say that an amateur would not understand this code if he received a report giving "F/SS/XX" after the signal strength, although it is possible that broadcast stations might be more enlightened.

● **Home-made QSL cards**

In answer to a recent appeal we learn from G2NS that excellent cards may be made cheaply by the following process: Obtain a wooden frame and stretch some miller's fine-mesh silk (this is used for flour sifting) tightly across it tacked to the frame. As paint or water-proof colour is used to produce the lettering, it is necessary to brush in cellulose as a filler. By leaving the letters open and filling in the "ground" round them, any colour squeezed through the silk by means of a rubber squee-gee will pass through the unfilled mesh in the form of letters. Full details of screen work will be

DX FORECAST FOR JANUARY, 1939

North America, (All times GMT)	7 Mc	14 Mc	28 Mc
Eastern States of U.S.A., VE1, 2, 3, VO, K4 and West Indies	2200-0800	1300-2200	0100-1800
Western States of U.S.A., K7, VE4, 5 and XE	0000-0800	1700-2100 0600-0800	1500-1730
Central America	2200-0800	1500-0800	1100-1600
South America.			
All	2100-0800	1900-0900	0700-0900 1100-1600
(Note:— S. America is frequently heard when U.S.A. signals are absent)			
Africa.			
ZS, CR7	1900-2100	1600-2000	0700-1600
VQ2, 3, 4, OQ, ZE, ZD, FB, etc.	1900-2100	1600-2000	0800-1500
FA, FT, CN, SU, ST, I7	1700-0900	0800-2000	0800-1500
Asia.			
J, XU, MX, VS1, 2, 3, 6, 7, UO, FI, HS, etc.	1800-2100	0800-1000 1200-1700	0800-1030
YI, ZC6, VU (north), U8, 9	1700-2200	0800-1000 1200-1800	0800-1200
Oceania.			
VK, VK4 (Papua), VK9	1900-2100	1400-1700 0700-1000	0900-1200
ZL, VR2, 4, 6	1900-2000	1600-1800 0600-0800	1000-1130 0700-1000
PK, KA, K6 (Guam)	1900-2100	0700-0900 1400-1800	1000-1130

Note:— Signals may frequently be absent from 14 Mc between 0100 and 0500 during January.

DX CORNER

G2NS points out that only the bolder type can be done in this way and smaller printing should be written in by hand with a ball-pointed reservoir nib; in fact a complete home-made card can be produced with such a nib. The "Easterbrook Speed Pen" or "Drawlet Pen" is the type needed. An alternative to using cellulose for masking the silk is ordinary good quality paper, cut out in the form of the required print, and stuck to the silk. 350 cards can be turned out per hour by this method. G2NS's QRA is, "White Cottage," Rowena Road, Southbourne, Hants.

G2QY of Mill Hill suggests that cards may be made on a "Hectograph," that the formula can be found in an encyclopaedia, and that the main constituent is gelatine. Although he does not go into details, the samples he sends us warrant further investigation by readers.

Clifford Brown, 381 Kingstanding Road, Erdington, Birmingham, 23, amplifies G2QY's suggestion by telling us that if small printing on P.C.'s is required it may be done on a Hectograph by using 3-ozs. of glycerine and ¼-oz. of gelatine; the latter being soaked in water for 15 hours, after which the water is strained off and the gelatine is added to the glycerine, which has been warmed in a saucepan. The required printing is written by hand on hard-surfaced paper with special Hectograph ink and then laid on the machine for two minutes. Printing is done with the squee-gee roller. One hint—do not make the printing too small otherwise the lettering will not be clear.

● Set-Listening Periods

Well, the vote has been absolutely unanimous and SLP's have come to stay! We quite agree that the combined results of a definite listening period have considerable technical interest, and we shall endeavour as far as we can to publish the best logs each month, spreading the reports over as large an area as possible. For January therefore we set the following periods:—

SLP 1.	1.7 Mc	Jan. 7-8,	2300-0010 GMT (CW only).
SLP 2.	3.5 Mc	Jan. 15,	0600-0730 GMT.
SLP 3.	14 Mc	Jan. 22,	1500-1700 GMT.
SLP 4.	28 Mc	Jan. 28,	1500-1700 GMT.

You will note that we have set these on Sundays in most cases, and it will be interesting to find the 1.7 Mc band full of CW signals during the RSGB Contest. As you have all showed such enthusiasm for SLPs, we shall expect some bumper logs for our March issue.

And still continuing with 1.7 Mc, we feel that a few remarks by G3HS of Faringdon, Berks, are of special importance; he says, "I am very pleased to see that you are giving publicity to the 1.7 Mc band which has been sadly neglected by amateurs and listeners alike in recent years. With careful listening, it is surprising what DX this band will produce, and we licensed amateurs on this frequency are only too pleased to receive reports, which are of great value since the number of stations operating is small compared with 7 and 14 Mc. Among the DX stations heard in December on CW were OZ2PX, OZ5XY (worked), F3RJ and a D4, as well as many GM and EI stations."

H. Owen of Newcastle, Staffs, has been busy and logged CR7, K4, 5, 6, OQ, PY, VP4, VQ2, 4, ZE, ZL

and ZS. Among the OQ's he reports 5AQ, 5AS, 5AV and 5HR, and although we have previously stated that we thought the latter was a pirate, we have to eat our words and tell you that this call comes from a survey boat sailing on the River Congo between Ponthierville and Kindu, actually well over a thousand miles inland. Cards should be sent addressed to the Captain of S/S *Kindu*. Ian Bates, 85 Jeanfield Road, Perth, is worried because a local GM8 is causing very bad key clicks over the LF end of the band, and he hopes this will catch his eye! Ian thinks the big advantage of CW is the high QSA/QRK ratio; we agree, a signal of R2 can be read, even when the band is nearly dead with no 'phones audible at all. W. R. Joss (2FOJ) of Hendon, remarks on the extraordinary good conditions during the weekend November 19-20. H. Sugden of Bradford is still there night and morning and doesn't miss very much! His best for evening listening include W7BVO, 5PHJ, VE5EF, K6OQE, VP7NS, ZS3F (don't forget S.W. Africa counts as a separate country), TG9AA, 9BA, XE3AX, 2IK, W5DEW, etc. New stations recorded include FB8AB, VU2FU, XZ2DY, VQ2FJ, UK1CC and K7FST; the latter's card, by the way, depicts a polar bear and a seal on the ice with the aurora behind. QSLs for K7FST may be sent to C. W. De Remer, Kotzebue, Alaska.

N. Vaus of Bournemouth is trying to find out how many countries he can hear in one month—he succeeded in logging 36 in five days, and we shall be interested to see who can lead in *this* little competition! Norman reports ZD4H, but as no such call exists, we suggest that this should read ZD2H, the only active amateur in Nigeria, and on 14280 kc.

● Survey of Conditions

S. F. M. Edwards (2FQX) of Hornsea, Yorks, sends us an interesting survey of November conditions. To quote from his letter, "The best Zones received during the month were on a line from South Africa to Alaska, FB, ZS, VP, VE4-5 being the most consistent. This is a reversal of October results, which showed best reception on a line giving VK, PY, VP and SU, and reference to a map will show that the two lines are at right angles to each other, bisecting near the West Indies. This accounted for the maintained strength of Central Americans who, incidentally, are coming through quite well on 7 Mc. At the end of the month, the reception line veered to W-E, with W1, 2, 3, 4, 8, 9, VE 1 to 4 as the best, and ZS good at about 1800, only when W6 and W7 could be heard."

● News in brief

D. Gray of Winchester informs us that ZS2N does not QSL unless IRC is enclosed. C. A. Betts of Birmingham received a card from VP6TR on which was written, "I always QSL when IRC is enclosed. I receive 25-30 reports every mail!" There are about six YL and as many Russian 'phones, but these are heard at irregular intervals. W. F. Thomson of London, N.12, received all U.S.A. districts on October 5 on 28 Mc 'phone. A. W. Ballinger, Westways, Frampton, Nr. Dorchester, Dorset, would like to correspond with any other SWL about 17-18 years old. (No objection to YLs!) F. Jones of Stoke-on-Trent sends a long list of calls for us to supply the QRA's, but we cannot undertake to duplicate the information in the Ball Book, and only give QRA's which do not appear in the latest issue.

CALLS HEARD SECTION

1.7 Mc

H. OWEN, 2 Campion Avenue, Basford Park, Newcastle, Staffs. Eddystone "All-World Two," 33 ft. end-on-ENE-WSW.
 CW—G2CF, IN, IX, OG, QM, RI, 3AM, BU, GH, HS, JW, MD, PJ, SP, TP, VA, 5AL, GN, HF, HS, JU, KV, PX, RX, RY, UM, ZQ, 6BO, CI, FW, GL, GM, JB, PA, YR, 8GG, IV, MD, ML, NF, VN. **GM3DR**, UU.

CW5TC, 6AA, 8JY. **OZ2XA**, **SM7UC**.
 *Phone—G2DF, 3DV, 5BM, CZ, GN, ZT, 6LL, ML, NI, 8FU. **F8WF**.

G3HS, Coxwell Street, Faringdon, Berks. 0-v-2, W3EDP aerial, December.
 CW—G2CF, JL*, AF, QM, GC, IG, IC, OU, 3LP*, LZ*, JU, JO*, HC*, GN, CK, PH, HL, UR, 5HS*, LO*, UH, BM, UM, RI, ZO*, 6PA, 8PX*, VP, VN*, ML*, DA. **CW5BI**, TV, 6KY, DP, GL*, ZQ*, VD, NB, 8CT*, NG, NF, QY, GG.

OZ7BR, 2PX, 5XV*. **F8RJ**.
 Phone—G2GG, BL, PO, 3HC, JO*, GH, OA, 5BM, BK, RD, MM, 8DT, I.B, DA, VP*.
 *QSO.

BSWL24, 165 Cambridge Road, Kilburn, N.W.6. SG-v-Pen and SG-v-QPP, 14 Mc half-wave vert. doublet used as "T."

CW—G2BK, CF, FO, HW, QM, RI, TG, UJ, 3BU, BY, FM, GH, JO, JU, KX, MD, OA, SB, UJ, WI, HS, 5AL, BM, GT, IB, IV, KT, MY, PA, RI, TN, ZO, ZT, 6CI, KP, TR, VD, YR, YU, ZR, 8GG, GQ, MD, NF, PX. **GM3UA**, UU. **CW5TC**, YB, 6KY, 8HT. **E15S**, **F8RJ**.

*Phone—G2AJ, KT, VQ, 3DV, GW, JT, MD, WC, 5CU, CZ, IB, OA, ZT, 6BD, GO, JB, SQ, TI, 8TI, JM. **CW2BG**, 5BI.

P. CLIFTON, 99 Nowell Road, Barnes, S.W.13. Battery 0-v-1. Inverted "L," 18 ft. high, 30 ft. long, N-S. October.
 CW—G2CF, IN, 3LZ, MD, JU, OA, 5GN, 6PA, ST, CG, 8JM, IV, JL, NF, GG. **ON4BL**.

*Phone—G2XP, KT, WT, DQ, PO, 3CA, WC, BR, OJ, 5IB, CD, BC, CZ, MM, WW, 6HG, LL, KV, KG, 8SK, GS, KW, TL, DS, GP, WV, NV. **F3HD**.

G3JO, 7 Surrey Road, Swindon, Wilts. "Sky Buddy," 76 ft.
 *Phone and CW—**GM8SV**, XI, SR. **G2GG**, AJ, KG, BL, 3OA, NT, OJ, GS, GH, HS, 5BM, HS, RD, KT, TN, BK, LO, UM, QY, ZQ, ZT, CZ, RX, 6PA, QM, KF, LF, CI, YR, CG, TR, 8VN, PX, NF, LB, DT. **F3MD**, AR, 8RJ. **SM7U**.

A. H. DYER, BSWL672, 13 Fore Street, Torrington, Devon. 1-v-2, 8 ft. vert. brass rod. Between Nov. 12 and Dec. 11. *Heard Dec. 11, 0005-0130.

*Phone and CW—**F3MD**, **E15S**, **GM6SR**, **CW2BG**, OP, WO, 5BI, OC, 6KY, 8HI. **G2BI**, CF, ID, IN, JL*, RI, WC*, XP, 3AM, BO, FM*, GH, GW*, JU, RC, SI, TG*, UJ*, UR, VA*, WC*, 5BM*, BK, CT*, CZ, GN, HS, IB*, IH, JU, LM*, NC, PX, RI*, TC, UQ, ZP, 6AB*, FO*, GM, GX, HG, JU*, LF, LQ, TL*, UT, 8CT, GJ, JM, MD, ND*, NL, TL*, US, KW. **CW2BG**, 6KY*, 8HT*. **E15S**.*

M. G. BOURKE, 2AOU, "Crediton," Samares, Jersey, C.I.
D4SZK, **E15S**, **F3MD**, **G2DF**, DQ, JL, JZ, 3GH, GW, MD, SI, WC, 5AL, CZ, KV, MM, PK, QY, RI, ZT, 6AB, CG, GO, JB, KP, LL, NB, PA, SQ, TR, VC, XS, 8IR, NF, NV, PX, TR. **GM6XI**, **CW2BG**, HU.

7 Mc

H. OWEN, Newcastle.
 CW—**CM2PF**, **K5AG**, **U2AW**, 3BP, 4AM, 5AH. **UK1VM**, 3AH, CU. **VE1KN**. **VO1W**, **W1AW**, DGW, DKS, LAL, LEV, 2LJC, LLY, 3DKZ, GQX, ONK, 8ODP, REI, SGF, SHF, 9HPB, YXO.

M. G. BOURKE, 2AOU, Jersey.
CM2KL, OR, PF, 7LR. **K5AM**, **LUIUB**. **VE3VD**, **W6KSY**, OP. **XE1NN**, **XOH1WW**. **XOZ3OA**, **YV3AH**, **ZAIAC**, **TF3C**.

14 Mc

M. G. BOURKE, 2AOU, Jersey.
CE3BQ, EE. **CM2WD**, 6DH, 7FR. **CO3RG**, RR, 6OM, 7VP. **CR6AI**, 7BT. **F18AC**, **HH4AS**, **HK3CC**, **HR2ON**, 7WC. **I2HP**, JJ, KG, NF, 8CA, 3FK. **KA1CS**, **K4DSE**, 5AA, AG, 6PAS, PHD, PMP, 7GIE. **LUIJC**, 2DD, 9BV. **NY1AA**, AB, AE. **OQ5AO**, AV. **OA4R**, **OX7ZL**, **OY7AN**, **P11BV**, **PK2AY**, 8WI. **PY1AG**, AJ, HJ, DP, DS, 2AX, BZ, CN, CW, DN, HQ, MI, NG, 4AP, CT, EB, 5QG. **TC3AC**, 9BA. **VK's**-88. **VPIZA**, 2AB, AD, AP, IC, 4TK, 6TR, 7B, 7NC, NR, NS, 8AD, 9L. **VQ2MI**, 3HP, 4KTB, 8AI, AF. **VR6AY**, **V56AB**, 7GI. **VU-9**, **XE1DD**, **XU2JH**, 4XM, 7CK. **YI2BA**, **YV1AQ**, 4AE, 5ABY, AK. **ZD2H**, **ZE1JI**, JS. **ZL-39**, **ZS-32**.

J. C. FLETCHER, 4 Cyril Road, Bexleyheath, Kent. "Super Skyrider (SX16)." 20 m. doublet, 24 ft. high, due W-E. 8.11.38-11.12.38.

CW—**CR7AF**, AG. **CX1FB**, **K4DTH**, **ESH**, 5AA, 7FNE. **LU2DD**, **OQ5AQ**, **PY1AJ**, CI, DS, 2DN, 7AO. **TF3C**, 5M. **VK2AGJ**, OE, SS, VN, 3DD, VJ, VQ, 5WR. **VE5ZM**, **VO1B**, I, 3X. **VQ2MI**, 3HP, 8AI. **ZD2H**, **ZE1JT**, **ZL2GN**, IG, 3GR, 4DQ. **ZS1AG**, BF, CK, CN, 2AM, G, X, 4AA, 5AB, AX, 5BK, BW, Z, 6BT, EH, EZ.
 *Phone—**H17G**, **LUIJC**, **PY1HC**, **VO1Y**, **VP6FO**, TR.

CON. G. TILLY, BSWI319, Bristol 6. 11.11.38-8.12.38.

*Phone—**CE3AT**, BK. **CN1AF**, **CO2JJ**, LY, RG, RH, SV, 7CX. **F88AD**, AH. **FT4AE**, AK. **HH2B**, **H13N**, 5X. **HK3CG**, JA. **K5AF**, **KA1CS**, JP, ME. **LUIQA**, 4BC. **OH2OI**, **OQ5AQ**, **PK3WI**, 4DG, 4JD, 4KS. **PY1BJ**, FN, GU, 2AK, CK, KS, MI, 4AJ, CT, 5AQ, 6AI, 7AI, 8AD. **SULAX**, KG, MW, RD, RH, RO, TM, WM, 2JR. **TF3C**, **TC9AA**, **T17AF**, **VE3ADC**, AFD, EO, HI, IX, LL, LW, QD, QJ, QP, YW, 4EK, IF, SS, ZK, 5EF, 9AT (Ont.). **VK2ACL**, AGU, TR, 3BM, BZ, IG, TL, 6MW. **VP3AA**, 4TK, 6LN, MR, 7NC, 9L. **VQ2HC**, 4ECJ, KTB. **VU2CQ**, FU. **W5EHM**, DEW, 6EJC, GVM, OI, 7BGO, 9CVN (Kansas). **XE3AX**, **YL2RB**, **YU7XU**, **YV1AP**, HAE, AX, 5ABO, AG. **ZE1JA**, JN. **ZS1BL**, BX, 2AF, AQ, AV, L, N, X, 3F, 4H, 5BZ, 6DK, DL, DW, DY, EJ.

28 Mc

BOB EVERARD, "Belle Vue," Nelson Park, St. Margarets-at-Cliffe, near Dover, Kent. **RME510X** and "Sky Champion." 8.11.38-8.12.38.

*Phone—**W60TU** (Nevada), KR, EOW, OSP, ERT, FT, CRK, NLP, NLS, PDB, PKK, OKO, QLN, AK, KB, MVM, JRM, NIO, OTU, 7ACD, GGG, EMP, BJS. **ZS1AX**, 2BJ, AF, J, 4H, 5T, 6EG, L, W, ED. **VK2IQ**, GU, 4AP. **PK1VY**, 2WL. **H17G**, **VP3AA**, **K4EZR**, **UK3AH**, **ZE1JR**, JU, JZ. **FA3JY**, 8ZZ, CF. **CN8AJ**, AV, BA, MI, **T12AV**, RC, 3AV. **PY2CK**, MI. **LUIET**, 7AG. **SU1MW**, GP. **KG**, **VO2N**, **VE1DR**, CF, 2AA, CA, FK, KX, IN, 3AIW, AWX, KE, AQ, AWB, LB, 4ALO, IF, WJ, BF, GD.

M. G. BOURKE, 2AOU, Jersey.
AR4FT, **FB8AA**, 13FZ. **K4EVR**, 5AT. **PK2WL**, **PY2CK**, **T12AV**, **VE4ALO**, BF, JJ. **VK2AO**, TI, 5IT, LD, RT, YM. **VP3AA**, 6MR. **VQ2FJ**, 3TOM. **VU2AN**, **W5-14**, 6-44, 7-19. **XZ2EX**, **YV5AE**, **ZB1R**, **ZC6AQ**, **ZE1JA**, JG, JJ, JU, JZ. **ZS1AF**, AX, 2BJ, J, 5T, 6CR, DI, DY, EU, L, T.

S. F. M. EDWARDS, 2FOX, Hornsea.
 *Phone and CW—**H17G**, **VE3AQ**, 4SH. **VK3CU**, 5KO, RT, 6BF. **W5BHM**, **DHK**, 6MDN, FT, NLS, NF, UKQ, PDB, ERK, 7DX, EMP, 9GWM, USI, CGO, USU, UWY, YLW, WSB, ZNA. **YL2CM**, **ZL2DS**.

FROM OVERSEAS

WILLARD PARKER, 5322 Tremont St., Dallas, Texas, U.S.A. 3 weeks ending 13.11.38.

28 Mc—**G6GF**, BW, IA, WX, CU, BT, BG, JW, LT, BC, BH, DT, DH, GO, MA, 8BT, BM, TD, QX, MU, SA, KD, MA, JZ, MX, IG, JQ, TD, RJ. **GM6JW**, **G2PU**, VG, IF, CG, NM, IS, HX, BY, MI, 5NR, NI, BM, SA, GS, BJ, QY, ZG, CW, WP.

LE ROY WAITE, 39 Hanning Street, Ballston Spa, N.Y., U.S.A. "National SW3 TRF." 90 ft. inverted "L," 38 ft. high, NW-SE, lead-in NW.

28 Mc—**G2CG**, HX, IS, MF, MI, OC, PU, SD, WD, WS, ZV, 5BJ, BM, GS, LJ, LU, NI, QI, SA, TP, VT, VU, 6BW, CG, CL, DH, GS, KL, ML, RH, TG, TL, WT, WY, ZQ, 8BM, IG, JO, LD, MA, MU, MX, OX, QX, SA, SB, TD, TX, WS. **GM6RG**, **CW5KJ**, 6JW.

GEORGE DOWNER, 13 Coleman Avenue, Homebush, N.S.W., Australia. "Class B 1-valve" with untuned RF. 66 ft. 19 ft. high, free end SE. 1.10.38-8.11.38.

7 Mc, CW—**G3HB**, 14 Mc, CW—**G2NN**, DH, DX, MA, 3IQ, 5KG, BD, 6BT, YR, TD, QX, RH, VX, 8GQ, KA, IP, RI, JM. **GM3CC**, **CW5LV**. *Phone—**G2AK**, 3QR, DO, IZ, 5DR, ML, 6JL, 8SB, CL, KD, VC. **G13KV**. 28 Mc, CW—**G5OV**, BJ, 6WY, 2CR, XC. *Phone—**G2MV**, 6WT, 8KD.

ROGER LEGGE, Jr., Editor, 20 Beethoven Street, Binghamton, New York, U.S.A.

7 Mc 'phone (heard in Eastern USA, 0700-0930 GMT)—**G2XV**, IL, HN, 3PR, SI, AC, IV, NL, GS, TN, 5CP, SA, JA, OK, 6TW, VQ, UX, KB, 8IT, LV, OC, 3YK, 6CL. **G12JP**, 5OY, 8GK. **CW3KY**, 6JW. **GM3TR**, 8KQ.

14 Mc 'phone—**CW2IP**, 5PH. **GM8RU**, 6MS. **E12N**, P, 3J, 6G, 7M, 8A. **G13KV**.

28 Mc 'phone (1200-1800 GMT)—**G2JU**, MI, PU, SD, MV, BY, WS, JR, XV, AO, ZV, DV, VG, RX, DD, HX, HK, KU, AO, MF, CG, IS, OC, 3BI, OO, 5BM, KH, BJ, JO, ZG, BM, TP, MV, QA, BY, ML, KH, ZT, GI, LJ, NI, VM, LU, SA, DT, OJ, 6OG, WT, WU, BW, WY, GS, OU, VK, JA, CI, LK, YU, BC, GR, PC, LC, ZG, ZO, TI, DT, KL, JQ, OS, WX, DH, GO, TG, RW, PY, NF, 3QD, 8MX, ML, TX, MU, SI, TD, IP, OO, IG, QI, DM, TD, DD, MA, AP, JO, QX, JV, LP, KD, OQ, SA, GX, DT, 6IA. **GM8RJ**, 6RG, RV, XW. **CW3AX**, 8HI, 6JW, 5KJ. **E18L**, 6G, 9J, 7M, 4N.

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- C. LESSER.
- G. C. LIDSTONE, 2FDN, N.2.
- P. SHAW, Peterborough.

CORRESPONDENCE

Audio Oscillation with 1 Volt

Till I read the article "Still More Morse" in the December issue, I had never realised that an audio oscillator would work with less than about 6-7 volts on the plate. I soon had one going on two volts and now I find that a Triotron H2 oscillates easily with a 1.5-volt dry cell. The coupling transformer is 3:1 and one volt or less will produce a useful signal.—S. R. C. DORMAN, Riversdale, Ridgeway Park, Portadown, Co. Armagh, Ireland.

QSL 1.7 Mc, Please

I should be glad if you would mention that I welcome reports on my 1.7 Mc CW signals, frequency 1772 kc. All such reports will of course be acknowledged in the usual way.—BRIAN W. WARREN, G6CI, 19 Melville Road, Coventry.

More About 7 Mc

I am struck by the fact that the new man on "40" with QRP has very little chance against the QRO and resulting interference on this band. Some of the high-power 'phone operators are so selfish that they work duplex for hours on end, obliterating many QRP stations and making it practically impossible for them to get a 100 per cent. contact. This encourages the use of "pernicious practices" like ECO, with the result that the situation is made worse. Until something can be done about it, I, like many others, will have to be content to remain an SWL.—JAMES MATHIESON, 31 Reid Street, Bells-hill, Lanarkshire, Scotland.

Worth Trying!

I am enclosing herewith a diagram of a very successful crystal-receiver circuit for five metres. Experimenters all over the United States are using this hook-up for checking the amateur transmissions on 56 Mc, there being thirty of these simple little sets in Cleveland, Ohio, alone. The range is way beyond the visual, giving reports aplenty to transmitting amateurs. If your experimenters would go the bat on these receivers, I am sure it would be a great help to your amateurs on this largely-experimental band.—LES. HULET, 34 Desbrosses Street, New York City, U.S.A.

[The sketch sent by Mr. Hulet shows a straight crystal receiver circuit, using a carborundum detector energised by a potentiometer across a 3-volt dry cell. The coil is 8 turns, self-supporting and 1/2-in. in diameter, with the aerial tapped two turns down. The tuning capacity is a 20 mmF midget connected right across the coil, and there is an RF choke in series with the carborundum crystal. A fundamental or 5-metre aerial of some kind should be used and the bottom end of the coil earthed. A pair of sensitive headphones completes the outfit, by-passed with a .001 mF condenser. Our correspondent's letter arrived just as we were going to press, so we have had no time either to try the circuit or get it drawn for illustration! We shall probably remedy these defects in February. Such a receiver is of course only suitable for taking modulated signals.—ED.]

Straight v. Superhet Again

After handling the "Amateur Superhet" described in your issue of December, 1937, may I say that I disagree with 2DBW and all other supporters of the straight receiver, though I know that the latter has certain advantages. I made one modification to the superhet—the addition of another IF stage. I am now considering putting in a double-diode triode to get AVC.—D. SEFTON, 49 Clifford Avenue, East Sheen, London, S.W.14.

The Simplest Transmitter

I am interested in the "Simplest Transmitter" described in your December, 1937, issue and would be glad to know if an RFP.15 could be substituted for the PVO5-15 specified. Also, with self-supporting coils where could the aerial link be placed and is the transmitter suitable for 1.7, 7 and 14 Mc without changing values?—JOHN H. BRODIE, 79 Parish Road, Beddau, Pontypridd, Glamorgan.

[We print this letter because during the last twelve months a number of queries have come in concerning the single-valve transmitter mentioned by our correspondent, and the design appears to be a perennial source of interest. In the first place, any RF pentode can be used, provided the necessary circuit alterations are made, i.e., in the case of the RFP.15, filament chokes are necessary. A suitable circuit appears elsewhere in this issue. With self-supporting coils, the output link can consist of two or more turns—depending on the band—of flexible rubber-covered wire wound over the "cold" end of the tank coil. Alternatively, a stiff self-supporting link of the type used in the design of the "5-Band PA" in our May, 1938, issue can be employed. The "Simplest Transmitter" will work on 1.7, 7 and 14 Mc without changing component values, but will require extra capacity in parallel with the tank condenser on 1.7 Mc, while the efficiency will not be as high as on 7 Mc.—ED.]

American Greetings

May I take this opportunity to wish you and your Magazine continued success for years to come, and also please accept my sincere thanks for all the many kind remarks you have made about my station. With further reference to that letter of mine you printed in the October issue—beginning January 1, 1939, I have made a resolution I shall not break. When postage is not included in a report, then No QSL! Don't laugh—I mean it!—DOROTHY HALL, W2IXY, 186-18 Williamson Avenue, Springfield, L.I., U.S.A.

[Didn't we say you'd break before long! But we are sure English SWLs will understand and are appreciative of your generosity and co-operation. Thanks also for the kind words.—ED.]

Personal

May we take an inch of space to say how much we appreciate the many Christmas and New Year greetings we have had from readers in this country and abroad, both by personal card and expressed in the course of correspondence, which continues to increase to new record figures monthly.—The Editor and Staff.

CLUB NOTES—IN A NEW WAY

By S. W. Clark, 2AMW

(Assistant Editor)

IN AN EFFORT to provide space for every club report sent in we have had recourse to further paring by withholding the usual preliminary details. If any reader requires this information for the purpose of joining his or her local organisation we have a filing system ready to operate—where Secretaries have co-operated with us. It may be assumed we can always assist if the particular club or society appears in our columns. Just send us a postcard and we will reply immediately with all relevant facts as to address, subscription and so on.

It will assist us to help clubs if their officers keep us informed of changes and send in their monthly notes to reach this office by the 15th for the next month's issue—there is no question of payment either way in this connection.

● North-East

The most northerly news in December came from SOUTHPORT Amateur Transmitting Society. Here G8QG has received fellow-members' thanks for his part in the erection of headquarters and a tower mast rising to 55-ft., complete with a "J" type 56 Mc aerial. (There is a 56 Mc G record to be broken, and about 120 miles of sea at your door—Ireland is listening!) Membership is confined to AA's or full calls and among the latter G2IN and G5ZI are working with 5-metre CC, 2XU is on 7 Mc 'phone, 6YR has 99 countries while 8QG is after PY for WAC.

Seventeen miles south (radio reckoning) Birkenhead has its WIRRAL Amateur Transmitting Club, where members have been hearing of G8OC's experiments in the application of cathode regeneration on both HF and detector stages of his receiver. This and some unusual couplings appear to solve selectivity problems associated with straight as against superhets.* January 25 is reserved for a visit from a GPO representative—no, not that!—he will discourse on USW communication systems as seen by the Post Office.

There is a cluster of societies round Manchester, and the three providing news this month are within seven miles of each other, forming a nearly perfect triangle with STOCKPORT Amateur S.-W. Society at the southern point. This is a new formation, the first meeting taking place on December 13. Good luck, Stockport, and may all those plans of a transmitter, Morse practice, visits, etc., materialise.

ASHTON and District Amateur Radio Society have been trying to emulate the Kingston-on-Thames black-out by participating in a lecture where electrolytic condensers were stripped and blown up. In less hectic moments they have compiled a crystal frequency register which is offered to other societies. G3FF and 2CDY are the Morse instructors. Moorside Edge was visited just

before the cold snap set in, which was fortunate for G3PM (secretaries always get the blame).

N. MANCHESTER Radio Society hold their meetings on Sunday afternoons, and very busy they are, for apart from the usual lectures and constructional work, they offer to "commercial, broadcast or amateur" stations a signal survey and investigation of noise interference. The latter service is unfortunately a local one!

Dropping down-country to the WOLVERHAMPTON S.-W. Radio Society disclosed a certain amount of perturbation as to the future, due to a standstill in membership figures. All the Old Timers are there and now that comfortable headquarters are available for gear and meeting, matters will no doubt improve, as a speaker at the annual dinner last month remarked: "There is no reason why G8TA should not be known as the headquarters of one of the best amateur transmitting societies in the whole country." The will is there, for it has been decided to encourage younger entrants at reduced fees (2s. 6d. per annum) in order to augment the present membership of 50, 19 of which are holders of licences.

Eastwards, to the Norfolk coast. KINGS LYNN S.-W. Club present us with a memento (herewith). On the left of the table is a telephone connecting the ground staff with aerial contingent, G3SZ is behind it; a CO-PA and aerial coupler take the



centre and then a microphone amplifier and monitor; G3IP is on the extreme right; G2JS claims a portion of the table while Secretary G. Rodgers no doubt deserves the other seat.

Why the paucity of North-of-the-Thames reports? King's Langley, headquarters of WEST HERTS Amateur Radio Society, is the next call, and here the fare is very varied—CWR, a Query Bee (these are all the go now) and an interesting talk by D. Stewart on "Early Radio Attempts." We hope the Christmas Party was a success.

* [We should like to hear more of this.—ED.]

● Westerly—

Dead in geographical line with London and another 56 Mc hotbed (nameless)* is SWINDON and District Transmitting Club, brought into being at G3FL last month (no connection with the Short-Wave Society in that town, for our Club friends admit only holders of calls)—let us hear from you too, *Society!* We had better get off to Wales before anything starts up at Swindon!

CARDIFF and District S.-W. Club's new headquarters give promise of increased activity, but do not call there on the 19th of this month as the Blackwood boys are entertaining Cardiff—any other Thursday will repay a look in. Thanks for the December "News-Reel" and special greetings, Cardiff!

● Then South

Southwards across the Channel to Devon. EXETER and District Wireless Society have had four of their usual classic meetings since last we wrote: "Radio and the Moon," "The Voigt Speaker," "Electricity in Harness" were the titles of lectures, and a visit to the gasworks, where mention was made of the Milnes Gas HT Unit; all provided much thought.

WEYMOUTH and District S.-W. Club, too, have had their share of thought, for gales have upset G8WQ's mast and, having the wind-up they have shortened it. All is well, however, and transmissions have been further improved. Four new calls are expected.

Although the weather has been rough all along this coast BRIGHTON'S 2FNZ has not been affected. Receiver tests and 2FAD's modulation experiments were successfully pursued.

Before leaving the "Sunny South" let us see what Mr. Secretary Dowsett has to say for his EAST-BOURNE and District Radio Society. The "All-Metal Way" people have been down there telling members about the theory and construction of metal rectifiers.

Berkshire has as its representative NEWBURY and District S.-W. Club, where most of the members have a QR and QS affectation in conversation now that there is another AA (2FWB) in the ranks. The DX Contest produced good results and receiver construction is now the order, with competition to evolve the best SW coils, working to specified coverage. Here's a tip, secretaries.

● London—North and South

G3AZ, secretary of KENTISH TOWN and District Radio Society is campaigning for increased membership. This area is thickly populated and we have no doubt readers will rally round. The fees are 1s. 3d. per term and for this you may help build the society's single-signal superhet, learn Morse, hear lectures, and make use of other facilities.

ENFIELD Radio Society have decided the competition for constructional work by awarding first prize to 2DVL (5-m receiver) and the second to a

* [Thanks!—Ed.]

regular contributor to our pages—who doesn't have space for such things as the speech-amplifier he "compiled and presented" (clue!). G300 and 2CDB were the donors of the prizes.

ROMFORD and District Amateur Radio Society have indulged in a Mullard Cathode-Ray Tube demonstration and heard 2DVA talk on "The Relationship of Chemicals to Radio." Application has been made for a portable licence, to study local propagation.

ILFORD and District Radio Society's "Bulletin" for December has its usual galaxy of technical hints and tips, after a note concerning their G2QU christening (Belfast RST559x); but this is not the climax, for a new transmitter is being built. Meetings have been well attended and the two most recent—"Cathode-Ray Tubes" and "The Latest Valves"—were much enjoyed.

EDGWARE S.-W. Society complete the North-London quintet by reporting a successful annual dinner, the guest of the evening being G6CL, secretary of the R.S.G.B. With a membership of 40, those present were taken back through the Society's history to where five constituted the roll, and afterwards heard their chairman and G6CL in happy repartee.

South Londoners are well catered for, as the following notes prove. DEPTFORD Men's Institute S.-W. Radio Club commence a 13-week term on the 10th of this month and send us a photograph—to be used in our next issue.

NEW MALDEN Radio Society have changed their monthly meeting night to Monday, the next being on the 9th. Osram Valves and associated apparatus have been successfully demonstrated.

PECKHAM District S.-W. Club are getting ready for a DX contest (see our December issue "DX Corner"). 2DJN has passed the test for full call. Against the usual run of such endeavours (in our experience) the club-room was the scene of some DX during a demonstration by a member using a home-made RF-det-2LF. In return for your kind seasonal wishes we hope that all succeeding efforts will similarly come off.

The Short-Wave, Radio and Television Society of THORNTON HEATH have a full programme for January, culminating in a special transmission from their G8GY when 2RD, 2DP and 3FP will operate (31st). The week previous we are to see a commercial communication received crumble before a members' home-made superhet (if the said member has a modicum of luck!).

WEST NORWOOD is the centre chosen by the South London and District Radio Transmitters' Society as headquarters. Ex-ZS1AH has recently spoken of "Radio Conditions in South Africa." A special invitation is given to visitors.

Last of all, we have CROYDON, meeting place of the Surrey Radio Contact Club. Members are still discussing a first-rate annual dinner where sixty participants included thirty-five call-holders, with G2YL as the only lady present. A lucky draw and spelling-bee provided lighter fare and joint first prize for the latter somehow fell off the table into G6FO's pocket!

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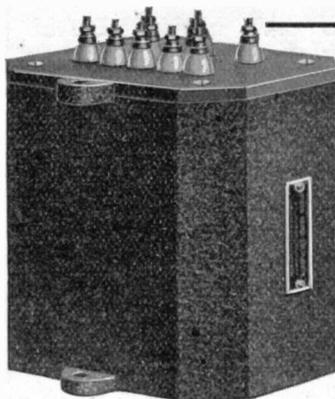
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SALE or Ex. 3- to 5-valve Peto-Scott RX cons. kit and sneaker less coils.—3 Hingeston Street, Birmingham, 18.

POWER Pack for Class B. etc.: 500v 120 mA, 4v 4a, 4v 2a, 6.3v 2a, 7.5v 2.5v, with swing. choke, MV rect. £2.—BSWL

OAK radiogram cabinet, new, no holes; Armstrong 7-v. AW 1937 chassis compl.: Amplion PM speaker. Offers? — 67 Kingshill Drive, Kenton, Middlesex.

EDDYSTONE "Kilodyne 4," 12-200 m. valves and coils, as new. 65s. or nearest.—2BNK, "The Newlands," St. Mary's Road, Leamington Spa.

EDDYSTONE 957 .0002 SM, 2s.; 2 Polar SM .00015, 3s. 6d. ea., Compax .0005 9d.—Walford, Middleton Stoney, Bicester, Oxon.

WANTED, cheap 0-1 mA or microammeter. Calibration need not be correct.—Price, condition to 27 Warstock Lane, Birmingham, 14.

SALE or swap, 5-metre battery RX, 17s. 6d.; also modern Pye 3-rang condenser, station-named dial.—2DXY, Chantry, Churchtown, Glos.

BARGAINS! Radiogram oak cabinet, 19s. 6d.; headphones, "Brands Sup." 4s. 6d.; Dr. Nesper, 3s. 6d.—W.J.B., 63 Avenue Approach Bury St. Edmunds.

716, 171 Leckhampton Rd., Cheltenham. AC Mains SW converter, with heptode FC, 10 to 60 metres with plug-in coils and 6l. trans. 25s.—BSWL716, 171 Leckhampton Road, Cheltenham.

AL. Box with lid, 10in. I, x 8in. W x 7in. H, bolted sides, grided for UHF RX.—F. Turner, 20/3rd St., Pont., Leadgate, Co. Durham.

EXCHANGE. "All-Wave Aerial" (Peto-Scott, 17s. 6d.), sealed carton; and cabinet LS. For any AA TX gear.—BSWL 914, 23 White Lee Gdns., Mytholmroyd.

ST900 Battery, all valves and 12 coils with Triple Extractor. Cond. ex. £3 5s. or near.—Walford, Middleton Stoney, Bicester, Oxon.

HALLICRAWTER "Sky Buddy," 1937 model, in first-class cond. £4 10s. or near.—2BNK, "The Newlands," St. Mary's Road, Leamington Spa.

BARGAINS! Halsan 4-v. AC/DC "Midget," with valves, MC speaker, 27s. 6d.; Ekco AC12, Elimin. 10s.—W.J.B., 63 Avenue Approach, Bury St. Edmunds.

HL2, 215P, 210H, PM1HL, LP2/C, 9d. ea.; PM12 H210 1s.; LP2, L210, 1s. 6d.; SP2, Y220, 5s.; SR2, 2s.; PP222, 4s.—Walford, Middleton Stoney, Bicester, Oxon.

HAM-BUILT exp. 5v. LF Amp. for AC Class B pen. output, with valves, 35s. or ex. good bug key.—G6PK, 19 Grove Rd., Surbiton.

BULGIN LF39, 2s. 6d.; J.B. neutralising cond., 1s. 6d.; B.T.S. coils S2, S3, S4, 1s. 2d. ea.—Walford, Middleton Stoney, Bicester, Oxon.

AMERICAN "SW&Tel." "Radio News" for Aug. Sept. Oct. 1938. Post free 7d. per copy.—Camp, 71 Sudbourne Rd., Brixton, S.W.2.

SELL—Parts for 1-v-1, pick-up and motor, speaker, all-wave 0-v-2, etc., etc.—2DFX, Monmouth, Mon.

STENTORIAN speaker, 39B, 5s.; Polar Midget 2-gang .0005 cond., dial. 3s.; ACO44, 3s. 6d.; 6F6G, 3s. 6d.; 41MXP, 3s.—G2LT, 2 Harbord Rd., Sheffield, 8.

HEAVY chrom. pl. trans. cur. mike, stand, and transf., cost £4, accept £1. Wx6 detector, 3s.—G6PK, 19 Grove Rd., Surbiton.

1938 ULTRA Stratosphere 10-tube transceiver, 2½-4000 m.; transmits 2½ and 5 m., £7.—C. Roberts, 30 Crogsland Rd., N.W.1.

BROWN "A" phones, 10s. 6d.; G.E.C. Battery-M.M. with valves, 12s. 6d.; Exide HT Charger, 12s. 6d., or lot 30s.—J. Bee, 12 Morningside Pl., Liverpool, 11.

EDDYSTONE "All-Word 2," almost new, with valves, coils. Grand snip, 55s.—E. J. King, 32 Mansford Street, London, E.2.

NEW Matchmaker 50-watt mod. trans. 12s. 6d.; Mains trans., 300-0-300 at 150 mA, 2 four-v. LT, 6s.—G6PK, 19 Grove Road, Surbiton.

0-12mA Tuning Meter (O.K. for R Meter); Philco 1A4E 1B4E. Would swap for flush MI, 0-100 mA.—C. Padgham, 3 Clarence Road, St. Leonards, Sussex.

SALE or Exch.—12 "S.W. Mags," July/June, bound, for meter or?—W. L., 2 White Head Pl., Cleveland Way, Mile End, E.1.

Magnovox 33 (Pen. outp. trans.), as new, £1 or exch. MC meter (0 to 100).—G3PR, 19 Corbyn Rd., Bordesley Grn. E, Birmingham, 9.

SELL PO Relay "B," 5s.; 4-v. 5l. trans. 5s. and 10s.; Tungar 6-v. charger, 30s.—G2NS, "White Cottage," Rowena Road, Southbourne, Bournemouth.

SALE or Exch. Collaro turntable motor, 220/250 v. (used for window displays).—G3PM, 7 Broadbent Avenue, Ashton-under-Lyne, Lancs.

WANTED—7 mc Tank with beehives. Give set of 4-pin coils (12-80 m.) and AF3 for.—C. Padgham, 3 Clarence Rd., St. Leonards, Sussex

NATIONAL SW3 Coils, one pair 80 metres, for sale, 10s. 6d. or nearest offer.—2DMH, 182 Burscough Town, Ormskirk, Lancs.

AF5, 4s. 6d.; G.P.O. type galvo, 4s. 6d.; ammeters (0-6, 0-3), 2s.; DC eliminators, 5s.; "No Mast" aerial, 4s. 6d.—Jones, 16c, Bishopric, Horsham.

UNUSED Eddystone Telescopic Aerial, 9s.; ideal for 56 and 28 Mc reception.—C. Brownlow, 135 Kneller Rd., Whitton, Middx.

TX or RX COMPONENTS in exch. for 9.5 m. cine gear and films.—E. H., 3/46, Renfrew Rd., Kennington, S.E.11.

SW RX wanted for five-stringed banjo and violin, in cases.—2DXL, 110 Chittys Lane, Dagenham, Essex.

WANTED—Lissen Bandsread Three.—Particulars and price to 2FDP, 37 Trumpet Road, Cleator, Cumberland.

STATION for sale. 2 TX's, 2 RX's and sundries incl. valves, meters, etc.—Stamp to G2YW, 18 Broadmead Road, Woodford Green, Essex.

"S.W.M." Class B one valver, compl. with valve and coils, 9-47 m. £2 5s.; B.T.H. headph., 7s.6d. extra.—G. Brownlow, 135 Kneller Rd., Whitton, Middx.

EDDYSTONE 5v. batt. super, 13-80 m.; 2-stage batt. amp. (Eddystone comp.); cab. 1093; 13-80 m. coils, less valves, offers.—L. J. N., 67 Corrance Rd., S.W.2.

XTALS (1.7 and 3.5), guaranteed ground to band. 5s. ea.—G6MY Morley, Yorks.

WANTED—Stationary petrol engine (about ¼ h.p.) or compl. Petrol-elec. gen.—2DFX, 16 Eland Rd., Langwith Junction, Mansfield, Notts.

2DTU going QRT, 45-ft. mast, £3 delivered; unused 6-tier rack, 15/-; one 3-tier, used, 5/-. Stamp for list.—41 Willoughby Road, Boston, Lincs.

FOR SALE R.F.P.15, 10/-; wanted, "Bug" key. Cheap—Apply G3VQ, 21 Minney, Moor Lane, Conisboro, Doncaster, Yorks.

CALL-BOOK for sale, spring 1937, 3/6 post free.—A. Jones, Sec. Torrington & District Short-Wave Club, New Inn, Torrington.

All copies of "The Short-Wave Magazine," from No. 1 to date, 6s. 6d. post free.—G. Brownlow, 135 Kneller Road, Whitton, Middx.

COSSOR battery 4v SH; ¼ HP motor, 220v. AC/DC. Sell or exch. home cine, mA meters or TX parts.—2FKB, 78 Shirehall Cres., Shiregreen, Sheff., 5.

EXCHANGE. Oct. 1936—Dec. 1937 "QST's" complete for 1934 or 1935 "QST's" complete.—Tonkyn, Trewdle, Tregurra Lane, Truro.

EFLX converter chassis, 7/6; WB senior, 12/8; Eddystone reaction 3/-; HT unit, 7/6; Hivac SG2205W, 3/6.—Stocks, 10 Bywater Street, Leeds 11.

£25 or exch. light car—50w proff.-built CW/phone transmitter; rack and panel, handswitched; cost £75; Photo.—Griffiths, 296 Thorold Road, Ilford.

SHORT-WAVE BROADCASTING STATIONS

Abbreviations: S—Sunday; M—Monday; T—Tuesday; W—Wednesday; Th—Thursday; F—Friday; Sa—Saturday.
All times GMT, twenty-four hour system.

M.	KC.	CALL-SIGN, LOCATION, SCHEDULE.
31.36	9,565	WIXK, Millis, 1000-0400.
31.37	9,560	OAXAT, Lima, 1630-1830.
31.38	9,560	DJA, Zeesen, 2300-0350, 0505-1600.
31.41	9,550	W2XAD, Schenectady, 2315-0300.
31.41	9,550	VUB2, Bombay, 0220-0320, 0600-0830.
31.41	9,550	HVJ, Vatican City, not used at present.
31.41	9,550	OLR3A, Prague, temporarily discontinued.
31.41	9,550	TIPB1, Paris-Mondial, 0415-2300.
31.45	9,540	DJN, Zeesen, 2150-0350.
31.46	9,535	Schwarzenburg, Berne, 1800-1900.
31.46	9,535	IJI, Tokio, 1930-2100.
31.47	9,534	VPD2, Suva, 1030-1200.
31.48	9,535	W2XAF, Schenectady, 2100-0500.
31.48	9,535	LKC, Jclow, 1000-1300, 1630-2200.
31.48	9,530	VUC2, Calcutta, 0706-0906.
31.49	9,530	ZBW3, Hong-Kong, 0130-0615, 0800-1430.
31.50	9,523	ZRH, Roberts Heights, 0415-1230.
31.51	9,520	OZF, Skamleback, 0100-0100.
31.51	9,520	HJ4AB, Armenia, 1200-1600, 2300-0300.
31.55	9,510	HSSPJ, Bangkok, Th 1300-1500.
31.55	9,510	GSB, Daventry, 1830-2100, 2115-2300, 2320-0200, 0220-0420.
31.58	9,500	OFD, Lahti, 1705-2200.
31.58	9,500	VK3ME, Melbourne, M-Sa 0900-1200.
31.58	9,500	NEWW, Mexico City, 2300-0600.
31.63	9,484	EAR, Madrid, 2100-2400.
31.69	9,465	TAP, Ankara, Turkey, 1900-2200.
31.79	9,437	COCH, Havana, 1300-0500.
32.02	9,369	XOY, Chengtu, 1445-1530.
32.15	9,330	OAXAJ, Lima, 1700-0500.
32.26	9,300	HIG, Trujillo City, 1200-1400, 1700-1930, 2100-0200.
32.61	9,200	COBX, Havana, 1300-0130.
32.88	9,125	HAT4, Budapest, M at 0000.
32.97	9,100	COCA, Havana, 1300-0500.
33.00	9,091	PJC2, Curacao, S 1536-1736, weekdays 1136-0136.
33.32	9,030	COBZ, Havana, S 1242-0500 (M), other days 1242-0600.
33.50	8,955	COKG, Santiago de Cuba, 2200-2300, 0230-0330.
33.53	8,950	HCJB, Quito, 2145-0315 ex. M.
34.62	8,665	COJK, Camaguey, 0100-0200.
34.68	8,650	HJ4ABU, Medellin,
34.97	8,580	YNPR, Managua, 1800-1930, 0030-0245.
38.00	7,854	HC2SB, Guayaquil, 2245-0145.
39.40	7,614	CR6AA, Lobito, M, W and Sa 1945-2145.
40.49	7,410	YDA, Bandoeng, 0130-0700.
40.65	7,380	XECK, Mexico City, M 0000-0100.
44.31	6,780	HHH, San Pedro de Macoris, 1740-1840, 2340-0140.
44.64	6,720	PMH, Bandoeng, 0930-1600, S 0230-0630, 0930-1600, or 1630.
44.84	6,690	TIEP, San Jose, 2100-0500.
44.94	6,675	HBO, Geneva.
45.00	6,666	HC2RI, Guayaquil, S 2345-0045; W 0215-0415.
45.25	6,630	HIT, Trujillo, 1740-1840, 2340-0240.
45.31	6,618	"El Prado", Riobamba, F 0200-0400.
45.39	6,610	YNLG, Managua, 1830-1930, 2300-0300.
45.70	6,565	H15P, Puerto Plata, 2240-0040, 0240-0440.
45.80	6,550	TIRCC, San Jose, T, Th, Sa 2300-0000; S at 1600; M 0100-0200.
45.81	6,555	HI4D, Trujillo, M and Sa 1655-1840, 2140-0040.
45.83	6,645	YV6RB, Bolivar City, 1500-1700, 0000-0230.
46.01	6,520	YV4RB, Valencia, 1530-1830, 2230-0230.
46.39	6,480	HIIL, Trujillo, 2240-0240.
46.39	6,479	HI8A, Trujillo, 1340-1540, 1940-2140, S 0210-0340.
46.40	6,465	YV3RP, Barquisimeto, 1200-1300, 2200-0230.
46.51	6,450	HI4V, San Francisco de Macoris, 1640-1840, 2240-0140.
46.73	6,420	YV6RC, Bolivar City, 1500-1730, 2230-0230.
46.73	6,420	HIIS, Santiago de los Caballeros, 1640-1840, 2240-0040.
46.80	6,410	TIPG, San Jose, 1200-1430, 1700-1900, 2100-0430.
46.88	6,400	TGQA, Quezaltenango, 0200-0400, S until 0600.
46.88	6,400	YV5RII, Caracas, 1330-1830, 2230-0330.
47.06	6,375	YV5RF, Caracas, 1700-1900, 2200-0300.
47.17	6,360	YV1RH, Maracaibo, S 1330-1930, weekdays 1600-1830, 21.00-0400.
47.28	6,345	YV1RG, Valera, 2230-0230.
47.39	6,330	COCW, Havana, 1200-0500.
47.50	6,316	HIZ, Trujillo, 1630-2000, 2230-0200.
47.62	6,300	YV4RD, Maracay, 2100-0100.
47.77	6,280	HIG, Trujillo, 1200-1400, 2040-0140.
47.85	6,270	YV5RF, Caracas, 0100-0400.
48.00	6,250	YV5RJ, Caracas, 1530-1730, 2130-0330.
48.05	6,243	HIIN, Trujillo, 1640-1940, 0010-0210.
48.11	6,235	HRD, La Ceiba, S 2100-2300, weekdays 0100-0400.
48.15	6,230	OAX4G, Lima, 2200-0400.
48.31	6,210	YV1RI, Coro, 1530-0230.

M.	KC.	CALL-SIGN, LOCATION, SCHEDULE.
48.47	6,190	TG2, Guatemala, generally as TGWA, also S 0500-0600.
48.58	6,176	ZHO, Singapore, discontinued.
48.59	6,174	NEXA, Mexico, 1430-1630, 2030-2230, 0500-0600.
48.62	6,170	W2XE, Wayne, 0500-0600.
48.72	6,158	YV5RD, Caracas, 1500-1700, 2000-0300.
48.75	6,151	HVJ, Vatican, 1900-1915.
48.78	6,150	HI5N, Moca City, 1140-1340, 1540-1940, 2140-0140.
48.78	6,150	CJRO, Winnipeg, S 2000-0300 (M); weekdays 2300-0500.
48.80	6,150	CR7AA, Lourenco Marques, 1710-2100, S 1500-1900.
48.83	6,147	ZRD, Durban, 0445-0550, 0830-1230, 1400-1700 (see August issue).
48.82	6,145	HJ4ABE, Medellin, 1430-1900, 2100-0400.
48.86	6,140	SP48, Warsaw, Poland, 2000-2230.
48.86	6,140	W8XK, Pittsburgh, 0300-0500.
48.94	6,130	CHNX, Halifax, 1100-0315.
48.94	6,130	VP3BG, Georgetown, 1515-1715, 2045-0015.
48.94	6,130	LKJ, Oslo, temporarily discontinued.
48.94	6,130	COCD, Havana, 1400-0600, S 1500-2300.
48.98	6,125	CNA4, Montevideo, 1500-1700, 1900-0100.
49.01	6,122	HP5H, Panama, 0000-0300.
49.02	6,120	O??, Helsinki, evenings.
49.02	6,120	W2XE, Wayne, discontinued.
49.02	6,120	NEUZ, Mexico City, 1400-1800, 2300-0630.
49.10	6,110	GSI, Daventry, 2320-0130, 0220-0425.
49.10	6,110	HJ6AB, Manizales, 2300-0500.
49.18	6,100	W3XAI, Boundbrook, 0200-0600.
49.18	6,100	YUA, Belgrade, between 0515-2230.
49.20	6,097	ZRK, Kilpheuvel, 1700-2100, S 1700-2020.
49.20	6,097	ZRJ, Maraisburg, 0445-0550, 0805-1230, 1400-1630. (see August issue).
49.30	6,085	HI5AB, Cali, 1500-1800, 2200-0100.
49.31	6,083	VQ7LO, Nairobi, evenings until 1915.
49.32	6,082	OAX4Z, Lima, 2330-0530.
49.42	6,070	CFRK, Toronto, 0100-0500.
49.42	6,070	YV1RD, Maracaibo, 0000-0400.
49.46	6,065	SBO, Motala, 2115-2200.
49.50	6,060	W3XAU, Philadelphia, 0100-0100.
49.50	6,060	W8XAL, Cincinnati, 1045-0100, 0400-0700, S 1300-0100.
49.51	6,057	ZHU, Singapore, 1040-1340; S 1540-1740.
49.59	6,050	GSA, Daventry, 1720-2100, 2115-2300.
49.65	6,042	HJ1AB, Barranquilla, 1600-0400.
49.67	6,040	WIXAL, Boston, 0000-0200.
49.67	6,040	W4XB, Miami, 1700-2000, 0200-0500, S 2100-2300, 0200-0500.
49.75	6,030	HP5B, Panama City, 1700-1800, 0000-0300.
49.75	6,030	HVJ, Vatican City, 1900-1915.
49.83	6,020	XEUW, Veracruz, 2300-0600.
49.83	6,020	DJC, Zeesen, 1630-2125.
49.88	6,015	HJ3CA, Bogota, 1600-1900, 2300-0400.
49.92	6,010	CJXC, Sydney, 1200-1830, 2100-0130.
49.92	6,010	PRAB, Pernambuco, 2100-0200.
49.92	6,010	COCO, Havana, 1255-0430.
49.94	6,007	XYZ, Rangoon, 0200-0345, S 0230-0430.
49.94	6,007	ZRJ, Maraisburg, 2030-2100.
49.94	6,007	ZRH, Roberts Heights, 0445-0550, 1500-2030; S 1030-1200, 1400-1700, 1615-2015.
49.96	6,005	HP5K, Colon, 1200-1400, 1630-1800, 2300-0400.
49.96	6,005	CFCX, Montreal, 1400-0415.
50.00	6,000	ZTC, Cape Town, evenings.
50.00	6,000	CNA2, Montevideo, 1530-0330.
50.00	6,000	XEBT, Mexico City, 1500-0500.
50.17	5,980	CS2WD, Lisbon, from 2100.
50.26	5,970	HJ4AB, Medellin, 0100-0430.
50.27	5,969	YV5RC, Caracas, 1600-1830, 2200-0330.
50.38	5,950	HH2S, Port-au-Prince, 0000-0300.
50.51	5,940	TG2X, Guatemala City, 0200-0300; S 0400-0600.
50.51	5,940	PJCI, Curacao, 2330-0130.
50.59	5,930	YV1RI, Maracaibo, 1600-1830, 2200-0330.
50.80	5,905	TIIS, San Jose, 1700-1900, 2300-0400.
51.02	5,880	YV3RA, Barquisimeto, 1800-1900, 2300-0300.
51.06	5,875	HKN, Tegucigalpa, 1830-1915, 0030-0300.
51.15	5,865	HIIL, San Pedro de Macoris, 1740-1900, 2240-0300.
51.28	5,850	YV1RB, Maracaibo, 1345-1445, 1615-1800, 2145-0300.
51.46	5,830	TIGPI, San Jose, 1700-1900, 0000-0400.
52.45	5,720	YV2RA, San Cristobal, 1630-1730, 2300-0200.
60.05	4,995	VUD2, Delhi, 1230-1730.
60.60	4,950	VUM2, Madras, 1200-1700.
61.10	4,905	VUB2, Bombay, 1200-1730.
61.22	4,900	HJ3CAH, Bogota, 1630-1900, 2300-0100.
61.48	4,880	VUC2, Calcutta, 1136-1736.
61.48	4,880	HJ4AB, Medellin, 2300-0400.
61.98	4,841	HJ3AB, Bogota, 1400-1900, 2300-0500.
62.50	4,800	HI1ABE, Cartagena, 1330-0400; S 1400-0200.

(13.92—31.35 m Stations were given last month).

QUERY COUPON

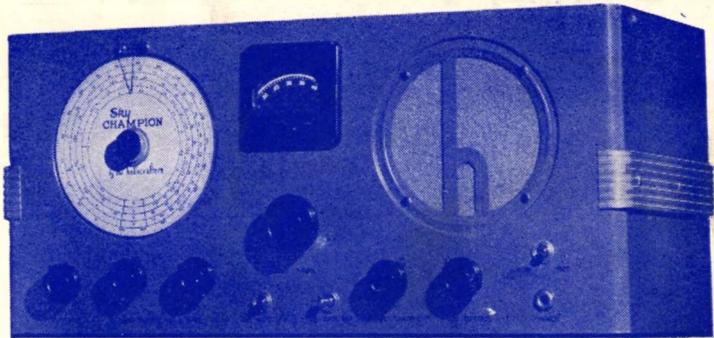
S.-W.M. 1/39.

HALLICRAFTERS

NEW SKY CHAMPION

FEATURES

- 8 Tubes
- Complete coverage 6.8 to 550 metres
- 4 Bands
- Separate band spread dial
- Individual coils for each band
- Inertia tuning mechanism
- Beat frequency oscillator
- AVC switch
- Excellent sensitivity and selectivity
- AF gain control
- Band switch
- Sensitivity control



● **THE SKY CHAMPION** is an 8-Tube, A.C. Communications Receiver with Pre-Selection and Built-in Speaker, complete in every respect, offering the amateur a quality of performance never before available at this low price. Its sensitivity and selectivity are only to be compared with communications receivers selling at double its price. This receiver provides full coverage from 44 MC to 545 KC, everything from Television Sound to the top of the broadcast band.

THE SKY CHAMPION offers all the essential controls for good amateur reception: r.f. Gain Control, Tone Control,

Phone Jack, AVC Switch, Beat Oscillator Switch, Send-Receive Switch, A.F. Gain Control, Band Switch, and Pitch Control. Sensitivity on all bands is extremely good, which is of especial importance on the popular 10 metre band. The separate Band Spread is better, on all amateur bands, than A.R.R.L. Handbook recommendations for band spread against scale calibration. Speaker is an integral part of the receiver—nothing else to buy.

For operation on A.C. current only.
Adaptable for battery operation.

Dimensions of Cabinet—18½" wide, 9¾" deep, 8½" high.

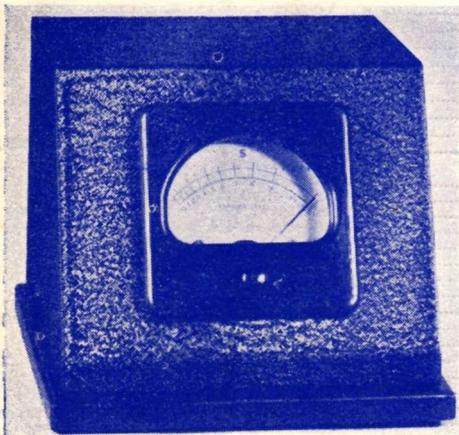
EVERY HALLICRAFTER MODEL IN STOCK. Send for new 50-page catalogue.

TUBE COMPLEMENT: 6K7—R.f. stage; 6L7—first detector; 6J5—high frequency oscillator; 6K7—i.f. stage; 6Q7—second detector, AVC and first audio; 6F6—power output tube; 80—rectifier; 6J5—BFO.

PRICE COMPLETE WITH LOUD SPEAKER

£15 15 0

Mains input adjustable from 110v. to 250v.



TYPE SM18 "S" METER

The HALLICRAFTERS signal strength indicator, type SM18, is complete. This meter has been designed as an accessory to the SKY CHALLENGER II and SKY CHAMPION. All that is necessary to connect the meter to the SKY CHALLENGER II or CHAMPION is to plug it into its socket on the back of the receiver chassis. The indirectly illuminated scale is calibrated in "S" units and will provide a convenient means of checking the relative carrier strength of incoming signals. On the rear of the meter case is mounted the zero setting resistor. The three foot connecting cable will allow placing the meter at either end or on top of the receiver cabinet. The type SM18 meter is available at a price of 55/-.

WEBB'S RADIO

(C. WEBB, LTD.)

14 SOHO ST., OXFORD ST., LONDON, W.1

BIRMINGHAM DEPOT
41 CARRS LANE

PHONE: GERRARD 2089