

The

6^p

SHORT-WAVE MAGAZINE

Exclusively for the
Short-Wave Listener,
Experimenter and
Transmitting Amateur

DECEMBER

1938

—
VOLUME 11
NUMBER 10

GALPINS ELECTRICAL STORES DEPT. E.J.W.

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N° 4.

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Short Wave

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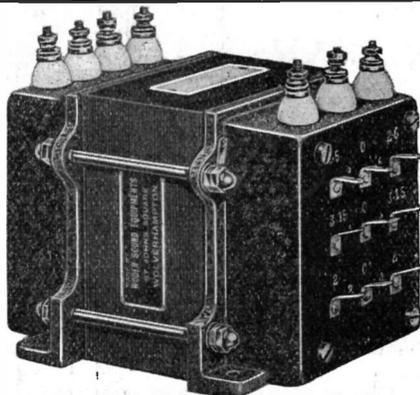
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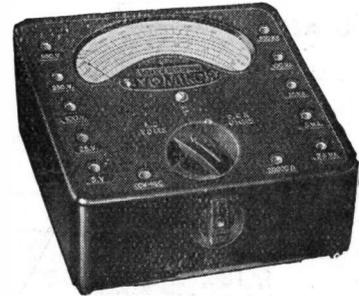
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and PERFORMANCE

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Price 54/-

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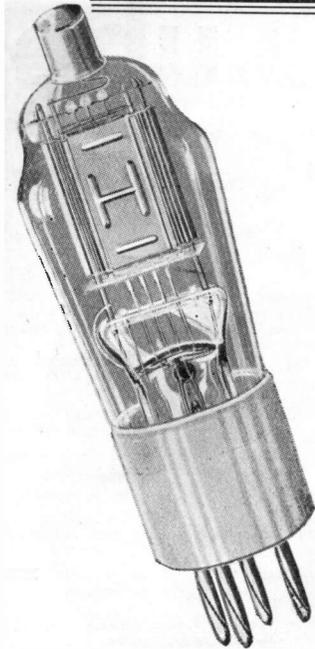
TWO-STAGE TRANSMITTER

L.T. Transformer, 2-0-2 volt, 4 amp
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TYPE PX230 SW ... 12/-
 " SG220 SW ... 12/6
 " D210 SW ... 5/6

Down to 3.5 Metres

For low-power transmission, the PX230 SW is worthy of consideration. It is a power triode, also with top grid and a ceramic base—this feature is common to all Hivac valves in the SW category—and is therefore an attractive proposition for the man who works from batteries and wants to get the highest possible efficiency in a simple circuit. This type costs 12s.

The above statement is taken from editorial notice which appeared in the August 1938 issue of this journal.

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The acknowledged superiority of S. G. Brown Type "A" Headphones with adjustable reed is accounted for by the excellence of their design and construction.

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A Precision Tube

AT A NEW
LOW PRICE

55/-



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E 40 - G 3
CATHODE RAY TUBE**

CATHODE RAY TUBE type E40-G3 is manufactured to the same high degree of precision as the larger Television tubes. It is invaluable for measuring modulation percentage, observing the effect of circuit alterations, checking for distortion or modulation hum, and for general experimental use. Low operating voltage.

OPERATING DATA

Second Anode Voltage	Va2	...	500—800 volts
First Anode Voltage	Va1	...	140—200 volts
Grid Voltage	Vg	...	0—25 volts
Heater Voltage	Vf	...	4 volts

Full details of this tube, together with a number of circuits showing application details, will be found in the Mullard E40-G3 booklet. If you have not already received a copy, post coupon below.

MULLARD

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CO. LTD., Cathode Ray Tube Dept.,
225 Tottenham Court Road, London, W.1

Please send me your **FREE BOOKLET** on
experimental uses of the Cathode Ray
Tube.

NAME _____

ADDRESS _____

The
Short-Wave Magazine

No. 10, Vol. II.

DECEMBER, 1938

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Editor - AUSTIN FORSYTH, G6FO
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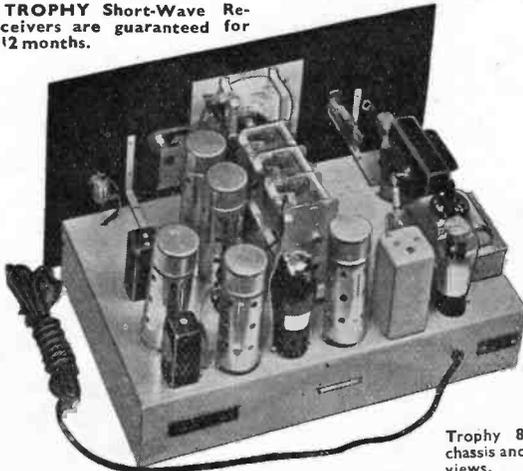
**BRITISH
and BETTER**

Xmas is gift time. Suggest, either for yourself or for others, something of scientific interest something that will certainly please and thrill. Here is a selection of

**EST:
1919**

Short-Wave and All-Wave apparatus that will delight the most critical.

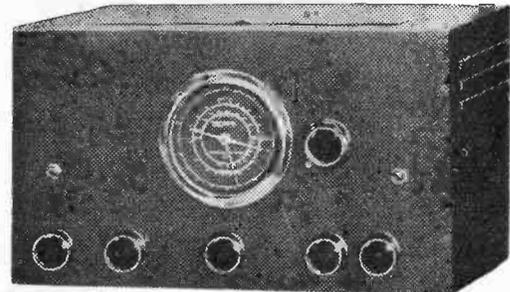
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Trophy 8 rear chassis and front views.

TROPHY "8"

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- 8 Valves, 5 Wave-bands, 43 M.C. to 545 K.C. Complete coverage.
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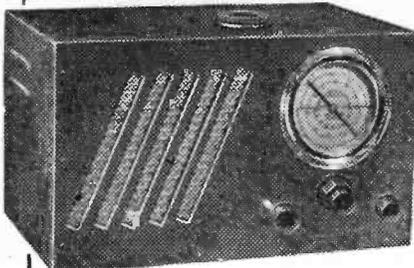
SPECIFICATION—The TROPHY 8 communication type receiver with a continuous wave range of 7-550 metres is confidently recommended to all short-wave enthusiasts. Maximum results are assured by a band-spreading tuning arrangement and by the incorporation of special refinements—appreciated by the most critical—and guaranteeing by practical and scientific methods, the reception of those highly interesting and thrilling transmissions always to be found on the Short Waves. Supplied complete in cabinet as illustrated above accurately aligned and ready for immediate use. Fully guaranteed. For A.C. mains only, 200/250 volts, 40/100 cycles. Terms: 15/6 down and 18 monthly payments of 15/7.

12 GNS. OR 15'6 DOWN

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**BATTERY and AC SHORT-WAVERS
6-550 METRES**



- Proved amazingly sensitive circuits.
- New and improved slow-motion tuning method free from backlash.
- High-fidelity incorporated speaker.
- Phone Jack

The TROPHY 3 is available for A.C. mains and battery use, employs a metre calibrated scale and is housed in a pleasing finish steel cabinet. Supplied with self-locating inductors for 12-52 metres.

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BATTERY MODEL, less batteries, Cash or C.O.D., £5 15s., or 7/- down and 18 monthly payments of 7/-.

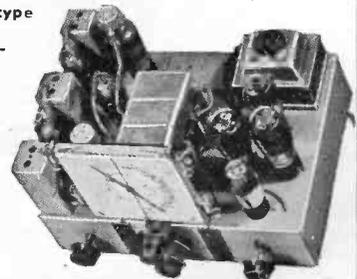
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- 9 British Octal-type valves.
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- Amazing sensitivity and selectivity.
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- 7-watts undistorted output.



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Try British—Buy British

THIS IS THE SEASON of the year for the spending of a little hard-earned money, and as regards radio enthusiasts, it is certain in what direction some at least of theirs will go.

In earlier issues, we have made it clear that our policy is not only to support, encourage and advise the radio amateur on all matters pertaining to the art, but also that we consider it a large part of our duty to do everything we can for the development of the increasingly important market which is slowly but surely growing up around Amateur Radio in this country. To this end, much work has gone on behind the scenes during the last year or so, and we are now beginning to see something towards the fulfilment of our hopes and efforts for a wide range of high-quality British apparatus, at the right price to meet competition from over the water, catering properly for the requirements of the British amateur.

Several prominent manufacturers have co-operated most willingly with us, and we have given freely what advice we could as to the design and cost of a great variety of apparatus. We should however here remark that in our opinion there is still too much equipment being offered the amateur which, being adapted for reasons of economy from designs primarily intended for other purposes or mistakenly based on some idea of making

Go all our readers at home, abroad, on the high seas and in the troubled corners of the earth, the Editor, Management and Staff of "The Short-Wave Magazine" send their good wishes for a happy Christmas and a brighter and more prosperous New Year.

a "wider appeal," is quite unsuited to his needs. The main effects of this half-hearted way of tackling the Amateur market are that British manufacturers as a body are unjustifiably held to be incapable of producing what is required, while amateurs themselves are equally wrongly blamed for not buying these unworthy products in large quantities.

But many of our people have at last seen that competition must be met by specialisation, and though there is a great deal of progress still to be made, we can truly say that a fairly complete range of British apparatus is now available, making it almost unnecessary to "buy foreign." We do agree that the price factor is not yet entirely to be ignored, but the fact remains that a given piece of equipment can be built to work rather better using all-British parts, the percentage increase in price being much lower than most people assume to be the case. Readers will have noticed that the majority of our constructional designs support these convictions.

We need only conclude by saying once more that the British amateur can best help himself in every way by buying British at all reasonable opportunities.

*Austin Foster
C.B.F.*

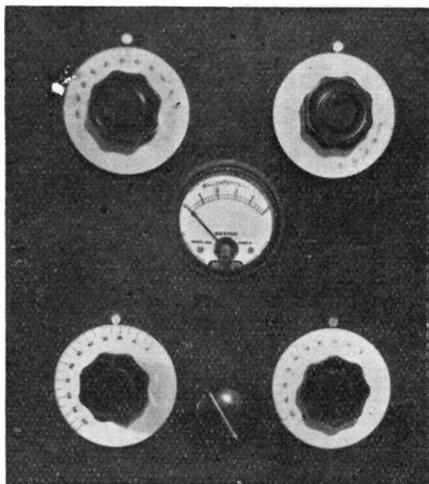
56 Mc Notes

By A. J. Devon

G5BY-G6FO 126-mile Link Maintained — Interesting Individual Reports — G2HQ's CC Equipment

SO FAR as we know, no contacts have yet materialised on the G/W week-end schedules, nor have any reports come in of DX reception either end. A station signing "W2JCY" has been heard near London, but according to our information, he was easily identified as a weak-minded pirate by the bad sending, key-clicks and similar indications of a purely local transmission.

Both G5BY (Croydon) and G6FO (Newport, Mon.) have been keeping the November watch in connection with the "Radio" Tests mentioned above and, in our last two issues, several other stations also having been heard, notably G2XC (Portsmouth) who was RST-449 at 1522 GMT on November 6, this being the third time he has been logged at Newport, 101 miles.



The compact 56 Mc CC CW/Phone transmitter built by A. W. Fawcett, G2HQ, Sheffield. Though four valves are used, the panel is less than 9-ins. square.

In connection with the G5BY-G6FO working, it is interesting to record that about half-a-dozen contacts have been made over three week-ends, while they have heard one another on various occasions when conditions were not quite good enough to get a solid QSO. G5BY is testing a multiplicity of aerial systems, including a W8JK beam, rotatable in both horizontal and vertical planes, and a 6-element Yagi array with reflectors and directors. These systems can also be used for reception, and with G5BY's 160-watts input and superhet receiver, it must fairly be said that it is he who is largely

responsible for the maintenance of the Croydon-Newport link, since he gives G6FO the best chance both ways. The equipment at the Newport station is as usual—24 watts input, multi-wave aerial and straight receiver—all of which will develop into something more ambitious as time permits. Present indications are that this will ensure almost certain working on schedule at any time, since G5BY is audible in Newport at varying strengths from early afternoon till near midnight, signal strength both ways peaking to S6-7 in the late evening.

G5BY considers that these results are due to a spell of really good conditions brought about by abnormal E layer reflection, in turn caused by the exceptionally mild weather in the early part of November. There has certainly been much QSB on nearly every contact, sometimes deep and slow, and at other times quick fading from S5 to zero, which is what makes a solid QSO almost impossible.

On November 4, when it was really warm in the south of England, G6DH (Clacton) and G5BY were QSO for the first time after trying for weeks. Contacts followed again on succeeding evenings, and G2OD (Ascot) also had his first QSO with G6DH on November 6. The distances involved are respectively 61 and 84 miles, while on that same evening G5BY was received in places at which he had not previously been heard, supporting his contention that conditions were exceptionally good that day.

● Some Station News

G6DH, Clacton, 56.2 Mc, is a very well-known UHF experimenter, now using a W8JK rotary beam and obtaining 15 watts RF output for it. G2OD on about 57 Mc has 40-watts input and a dipole, and G6QZ (Norwich) who has been active on the band for a very long time, 56.34 Mc, uses 20 watts and a 2-element W8JK. G5MA, Ashted, has a portable rig built into his car, with a generator driven from the engine and a rotatable horizontal dipole on the roof; the equipment is carried on the rear seat, with extended controls. It sounds to us something like portable gear!

Other active stations in the south are G2GG, G2LC, G5NF (who has been concentrating on 56 Mc for over a year) G8MG and G5RD. Up in the north are G2IN and G5ZI, both Southport and CC; they ask particularly for listener co-operation outside a radius of 40 miles.

In the West of England, a new station active is G6LQ (Weston) while GW8WU (Cardiff), GW5WU (Penarth) and one or two Monmouthshire people will be with us soon. G5JU and G6VF of Bristol are also regular workers on the band, and there is another group slightly further north suspected of using 'phone only with "squish."

● Individual Reports

Nearly all comment on the poor activity except in certain localised areas where enthusiasm remains high. BRS-1173, Heathfield, logged only G2AO, HG, LC, OD, UJ, XC, 5JZ and 80S, the best of these being G2XC at 63 miles. G8LY (Winchester) records usual locals though she has provided herself with a $\frac{1}{2}$ -wave vertical aerial nearly 80-ft. high, which is causing feeder difficulties.

G2XC (Portsmouth) says that with him 56 Mc conditions have been very much better during November, and he mentions three QSOs with G5BY (60 miles) since November 9, though they had never been able to work previously. 2XC has also been heard fairly consistently by G2LC (Leigh-on-Sea, 92 miles) and an attempt is now being made on G6DH at Clacton. G2XC reports N.D. on the G/W schedules, but heard W2XDG at about 1500 GMT on November 6 and 13, the American's frequency being approximately 39 Mc, which suggested promising DX conditions. 2XC also raises the question of whether the prevailing mild weather caused the general improvement.

2DDD (Littlehampton, Sussex) is another who confirms that conditions were good last month, when he logged G2MC, MV, OD, XC, 5BY, NF, RD, MA, 6FO, 8TX and F8AA, a French station at Boulogne, who verified. On November 12, from 2300 GMT, 2DDD followed both sides of the G5BY-G6FO contact, each being about RST-448.

An interesting listener report comes from R. Holmes, Painswick, Glos., whom we have mentioned before as being regularly active and getting useful results. Apart from "semi-locals" like G5JU and G6FO, he records G5XY (Southsea, 84 miles), G6OT (London, 88 miles) and G2MV (Coulsdon, 95 miles), this latter reception occurring during the total eclipse of the moon on November 7. At 1838 GMT on November 6, a heavy burst of electrical noise—presumably etheric in origin as the QRA is up a hill right out in the country—blotted out the band and was found to be tunable between 55 and 57 Mc.

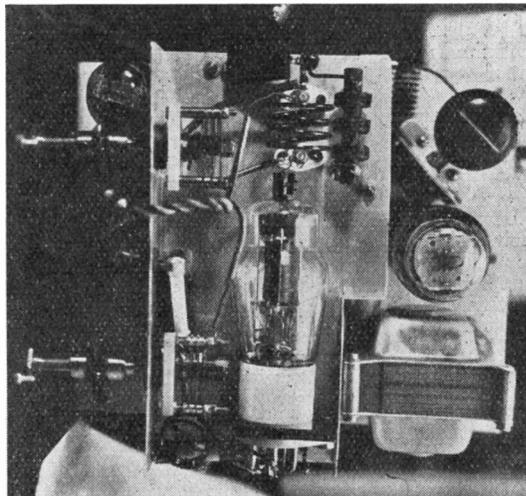
K. Ayers of Stroud, Glos. reports reception of an American police station (Boston, Mass.) at S7-8 with no QSB between 1200 and 1700 GMT on October 30, the estimated wavelength being about 6.75 metres. Here again is a suggestion that 56 Mc DX conditions must have been good at the time.

● Useful Rig

On these pages are photographs of the very neat 5-metre transportable CC transmitter designed and built by A. W. Fawcett, G2HQ, Sheffield. Measuring less than 9 inches all three ways, the circuit is 6J5G-HY60-HY60, with a 6V6G as modulator, link-coupled throughout on the RF side. A 10-metre crystal is used, with the second stage as doubler; G2HQ remarks in passing that if one has difficulty in starting 14 or 28 Mc crystals, they should be carefully removed and washed in acetone, as this failure to oscillate when new is quite common.

The 6J5G is an excellent CO, plenty of drive being available for the succeeding HY60, shown in the "innards" view mounted parallel to the front panel. Only one meter is used, that for reading the grid current in the PA. Two mA is the figure usually obtained, being enough to drive the final under modulation; neutralisation of this stage was found necessary, and achieved by twisting together two

short pieces of rubber-covered wire to the required capacity. Keying is carried out in the cathode of the doubler, and on 'phone both plate and screen of the HY60 final are controlled. As an indication of PA RF output, a 6-volt 0.3 amp bulb can be blown in a loop held near the final tank.



Inside G2HQ's five-metre transmitter. Note the screening.

The total consumption of the transmitter is 130 mA at 300 volts on 'phone, and 100 mA at the same voltage when on CW. We hope to give further details of this interesting and effective little rig in an early issue, with circuit and values, as this brief description scarcely does it justice.

At Soho Street

We have recently seen some very interesting apparatus and new equipment at Messrs. Webbs Radio, Ltd., 14 Soho Street, Oxford Street, London, W.1, including the Hallicrafters Dual Diversity Receiver—a magnificent affair, beautifully built and representing the very latest in standard American design—and the R.C.A. transmitter assemblies, incorporating 'phone/CW operation with built-in power supply in a form of box-frame construction.

Then there are the Hallicrafters Modulator Units, completely self-contained in three sizes of 15, 25 and 40 watts, costing respectively £10, £15 and £18 each and producing absolutely trouble-free audio output and having built-in mixer controls and line-switching.

Some other items worth mentioning are the Triplett thermo-couple ammeters, 45s. each in various ranges; a parcel of Weston model 301 moving-coil instruments in the 0-300 mA range only, at 12s. 6d. each and, last but not least, small tube-type neon testers for 1s. 6d.

Also available are the National 1-in. oscilloscopes, complete for £6, and another interesting line is the new McElroy Code Learning Equipment, which can be hired to responsible Clubs at 7s. 6d. per week. The output is entirely self-contained, AC operated, and gives a tape-recorded signal at any speed from five to 35 w.p.m.

HAVE YOU HEARD . . . ?

I AM UNABLE to comment at length on reception conditions during the period under review, but when I was able to listen I found them distinctly good at times; despite this many of my acquaintances say that they were variable and spasmodic!

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

● Test your skill

Last month I suggested that readers should try their dexterity by searching for several elusive stations I named. One reader, whose report will be found in this article, made a particularly praiseworthy effort, inspiring me to go further and to solicit reports on the following:—YDA, 40.49 m, CR6AA, 39.40 m, CR7AA, 48.8 m, TILS, 50.80 m, HIN, 48.05 m, XOY, 32.02 m and ZHJ, 49.51 m. The schedule of CR6AA, incidentally, is 1945-2145 Mondays, Wednesdays and Saturdays, and not as inadvertently given in our last station list, which will of course be revised next time.

● North America

Boundbrook, New York. The call of the former 17,780 kc station has been altered to W3XL, and, as many may remember, this was the call of an experimental station once heard near 46.69 m, generally collaborating in tests such as round-the-world flights, or broadcasts of outstanding importance. W3XAL has now secured new channels of 13.76 m, 21,630 kc, and 31.02 m, 9,670 kc, thus filling out the NBC's complement of wavelengths necessary to render year-round day and night service to Latin-America as well as European listeners. News broadcasts are radiated in six languages. Operation on the new frequencies has already begun, and Thomas P. Byrne reports the 31 m channel.

Ultra-high frequency reception. I am told by Bob Kenny, BSWL387 (Enfield), that reception of these stations has been remarkably good, but unfortunately, I have been without my USW receiver for some time and cannot comment upon this. My informant records W8XAU, Mutual Broadcasting System, 29,950 kc, from 1800-2100 approximately; W9XJL, Superior, Wisconsin, relay of NBC, 26,950 and W2XDV, Wayne, relay of CBS (W2XE), on 36.1 Mc. W8XAU is, of course, sister station to the 49.5 m W8XAL and which, incidentally, also now carries MBS programmes. R. Simpson (Australia) reports W6XKG and W9XUP, 25.95 Mc, W9XTC, 26.05 Mc and W9XJL and W9XAZ. On 31,600 kc, W4XCA, 8XAI, 9XUY, 9XPD and the 30,100 kc police W6XFE, XPW, XGC, XPA and 2XEM. Verifications have been received by all except W9XUP and 8XAI.

E. Hillman (London N.W.8) is anxious to know which stations are under NBC and CBC control. As far as I know, only the Boundbrook transmitters are actually controlled by the former, though W2XAD, XAF, 8XK, 1XK and a few others, derive their material from that body. The Canadian Broadcasting Corporation does not now appear to control any outlet since the demise of CRCX (for-

merly VE9GW); however, C. E. Sambrook advises that all WIXAL programmes are published in the Christian Science "Monitor." Better still, join the World-Wide Broadcasting Foundation and receive their programme booklets at fortnightly intervals.

● From the Land of the Kookaburra

The Amalgamated Wireless (Australasia), Ltd., Wireless House, 47 York Street, inform us that announcements are made from their stations in French, German, Dutch, Italian and Esperanto, in addition to English. The wavelength of VPD2, Suva, Fiji, is given as 31.44 m and schedule 1030-1200, Monday to Saturday inclusive. VK2ME, 31.28 m, will operate 0600-0800, 1000-1400 and 1400-1600 during December. The VK3ME and 6ME schedules remain as hitherto.

An extremely valuable report comes from an Australian enthusiast, R. Simpson (Concord West, NSW), in which he gives the following information:—PL6ZA, 6,410 kc, call of an expedition transmitter; VK8SA, Broken Hill, 6,690 kc, operates daily around 1000, requesting reports to Australia Inland Medical Services, Broken Hill; ZL2ZB, 6,690 kc, relaying medium-wave 2ZB, Wellington 2100-1300 and announcing as "2ZB, Wellington, conducting a test transmission on 6,960 kc. Station owned by Commercial Broadcasting Services," and XTJ, "The Voice of China," Hankow, 25.66 m, 11,691 kc, coming on the air at about 1200 with a female announcer. Two Saigon stations mentioned by this reader are one on 11,910 or 11,940 kc, between 1100 and 1300, the other being on 9,740 kc from 1200, both commencing their programmes with the "Marseillaise."

The same reporter states that a Dutch station taking the PHI programme is active in the 13 m band, also a Paris-Mondial transmitter near the same wavelength. The NIROM relay I discovered in the 49 m group and mentioned in October, was, as estimated, operating on 49.67 m, the call being YDA and not YDB as predicted.

● More News from the East

H. W. Darvill records reception of the new Manila KZIB on an announced frequency of 9,500 kc, 31.58 m, which closed at 1500. I understand that KZRM and KZEG are changing hands shortly, and that a new transmitter will be brought into use.

Indian reception is now amazingly good, both on 31.28 m via VUD3 and all of the 60 m channels, reception being at its maximum in the late afternoon. VUD3 has been excellent as early as 1430, while VUD2, 4,995 kc has also been surprisingly strong around 1700. Our Irish friend, Thomas P. Byrne, advises that a recent letter from Delhi states QSL cards are in the course of preparation and will soon be available.

HS6PJ, formerly HS8PJ, Bangkok, Siam, is now reported on 15,770 kc Mondays 1300-1500. L. P. Hutchinson says that reception is superior on the

9.51 Mc outlet, Thursday afternoons. This reader submits more valuable data as a result of my request to "watch out for these," stating that ZBW3, Hong-Kong, 31.49 m, is audible almost daily, Jely permitting, strength approaching R5; VPD2, Suva, has completely evaded him; JIB, Taihoku, 28.48 m, is logged regularly, the announcer signing off with the call "JFAK, JFAK"; JDY, Dairen, 30.23 m, heard frequently during its 1200-1300 session, with news in English at 1245; ZHP, Singapore, 30.96 m, audible when good conditions are prevalent and high speed telegraphy absent from its frequency, while KZRM is observed quite often between 1400 and 1500. The receiver employed is an all-wave SH10, the aerial a mediocre affair, and, in my opinion, the results attained extraordinarily good.

Japanese Broadcasts. H. W. Darvill (Enfield) sends the following schedules of the stations of the Broadcasting Corporation of Japan:—for Europe JZJ, 25.42 m, and JZI, 31.46 m, 1930-2100; for South America JZJ and JZI 2130-2230; Eastern districts North America JZJ 0100-0130 and 1200-1230; Pacific Coast, Canada and Hawaii, JZJ 0530-0630 and China, South Seas, etc., JZJ and JVP, 39.95 m, 1300-1430. A new type of card is now issued.

● Voices from Latin America

Listeners yet to make the acquaintance of HH2S should be glad to learn that this French-speaking

details are to be found in the Broadcast Panels of a few months back.

● Broadcast Programme Notes

W2XE advises that they will operate as follows until further notice:—

Weekdays—

1230-1500,	21,570 kc,	13.91 m	for Europe.
1800-2000,	15,270 kc,	19.646 m	"
2030-2300,	11,830 kc,	25.36 m	"
2330-0400,	9,650 kc,	31.09 m	for S. America.
0430-0530,	6,170 kc,	48.62 m	"

Saturdays and Sundays—

1300-1800,	21,570 kc,	13.91 m,	for Europe.
1830-1930,	15,270 kc,	19.646 m	"
2000-2300,	11,830 kc,	25.36 m	"
2330-0400,	9,650 kc,	31.09 m	for S. America.
0430-0530,	6,170 kc,	48.61 m	"

Readers should note the new frequencies.

W3XAL operates daily 1400-2200 on 17,780 kc; 2200-0400 on same frequency for Latin America and 2200-0600 on 31.02 for the same continent, the latter being in Portuguese, Spanish and English. A highlight to watch for is "The NBC Music Appreciation Hour," conducted by Dr. Walter Damrosch, Sundays over W3XL 1600-1700. This programme is beginning its eleventh season, and is regarded as perhaps the outstanding educational broadcast in the United States, with a school audience alone of more than six million students.

Some More Stations to be Pursued—Readers' Reports and Items of Interest

West Indian is much more powerful than ever hitherto, having presumably made an increase in power in addition to a change in frequency to about 5,945 kc. Announcements are in several languages, a four-chime signal precedes station announcements, clock chimes, unusual in character, are radiated at the hour, and an English programme from approximately 0130 onwards, including a news bulletin read by an American-voiced speaker. It will be noted that good-night greetings are made at 0130 but do not indicate the termination of the programme, neither does the playing of "God Save the King" signify that I am mistaken in thinking the programme originates in Haiti.

Other news in brief. HP5G has reverted to its official frequency of 11,780 kc; TGWB, Guatemala City is on 6,040 kc; CB1180 appears to be the "mystery" station on 11,970 kc, the slogan used being "Sociedad Nacional de Agricultura" and parent station medium-wave CB57; CB1185 relays CB138 "El Mercurio" on 11,850 kc; another Chilean near 30.8 m, believed to be in Valparaiso, heard around 2230 with bugle call signal, and a recent QSL from TG2X, "de la Policia Nacional de Guatemala," giving the details:—Power 500 watts, frequency 5,940 kc, schedule 2100-2300 and 0200 onwards; Sundays 2100-2300.

The "come-back" of the Paraguayan ZP14 is almost sensational. Some time ago I reported this rarely-heard transmission on 49.78 m; now it is received extremely well on about 11,725 kc from 2145 until 2245. The station's title "Radio Cultura" is used between each item. Additional

For up-to-the-minute short-wave information, tune to WXAD, 19.56 m, Tuesdays at 2230, or 2XAF at the same time; many excellent tips can be secured this way.

● Last-minute News

A. G. K. Leonard (Maidstone) reports a verification from XTJ, 11,691 kc, signed by H. P. Tseng, P.O.Box 90, Hankow, in which they claim that their station was the only Chinese broadcaster heard by listeners abroad. Mr. Leonard also supplies the following information:—XOZ, 19.34 m, and XOY, 32.02 m, Chengtu, broadcast in English, daily 1445-1530. ZHP, Singapore, 400 w, 30.96 m, operates Monday to Saturday inclusive 0940-1440; Wednesday 0540-0640; Saturday 0525-0640; Sunday 0340-0610 and 1025-1440. HBL every Monday on 9.34 Mc at 2345; HBP, 7.79 Mc 2345. On the first Saturday of the month HBO at 0745; HBJ 1245 and 1645. YIJG, Baghdad, Iraq, 41.67 m, daily 1330-2000; CRY9, Macao, Portuguese China, 49.3 m, 1500-1615 (a friend of the writer in Perak cannot hear this); VHSU, Port Moresby, New Guinea, 37.2 m, 1030-1300; XYZ, Rangoon, Burma, 49.94 m, which, he says, is to operate shortly. This reader enquires about Addis Ababa, 31.49 m, stating that he cannot hear it, but I know that it has been logged by listeners in Gt. Britain in the afternoon. Desmond R. Hill (Peckham) reports XEUZ, 49.02 m, closing with an English announcement at 0445; VE9HX with news at 0400 and W3XAL on its new 31 m outlet.

On The Amateur Bands

By Old Timer

WE ADDRESS ourselves this month to those who use CW on the 14 Mc band, especially in the HF portion. Have you listened between 14,400 and 14,450 kc recently, and have you heard the alarming number of stations habitually operating outside the internationally agreed limit of 14,400 kc?

We have no control over the behaviour of amateurs in other countries, but we must point out that many G's have been heard *outside* 14,000 kc, frantically calling some elusive DX, and it would appear that crystal control has *not* been used. No reputable crystal manufacturer will supply a crystal which is likely to fall outside our bands, as he works to a tolerance of 0.1 per cent, which means plus or minus 14 kc on 14 Mc, and allowance is made for this possible error. British stations are required to choose a frequency which will not fall outside the range 14,005-14,395 kc; therefore it is quite wrong to listen and, hearing W's between 14,395 and 14,400 kc, "park" your ECO on top of one of these W's and fondly imagine that you are in the British band.

We mentioned last month that the intense interest nowadays in raising new countries tends to make the amateur forget temporarily that he has a licence by which he must abide. He is tempted to squeeze a little nearer the edge than his competitor, which is dangerous unless he has positive knowledge of his actual frequency. Alas, how many of you can honestly say you know exactly when you are transmitting on 14,395 kc? Even if you possess a 100 kc bar, you must not forget the 0.1 per cent. error in original calibration which may land you several kc outside. We are only amateurs with amateur equipment; therefore, there are few of us who have laboratory measuring apparatus to determine *exact* frequency. Far better, then, to work 10-20 kc inside than to risk creeping over the edge.

● Intentional off-frequency calling

At the risk of receiving strongly-worded protests, we feel that a *small* percentage of G's deliberately tune their transmitters outside the band to raise a rare DX station. This is despicable behaviour and may well give the impression to the authorities that we are not capable of behaving ourselves on our own bands. To give a concrete example: PJ1BV and YS2LR were both working just outside the internationally agreed band; two prominent G6's QSY'd to 14,410 and 14,440 respectively and called these stations the whole evening. This is just one case of many that may be heard nearly every night.

One of the latest excuses made by off-frequency operators is rather startling, if not original. They agree at once that they were operating at the time mentioned by the complainant, but that their frequency was well in the band, and that obviously someone must be pirating their call. Off goes a "bluff" letter to the Post Office complaining bitterly of such a happening, and the GPO is probably put to a lot of trouble because of it. This would be passable bluff if only the fault was rectified at the

first warning, but the same signal (invariably chirpy) is heard the next night calling "test" outside 14,400 kc!

● Unintentional off-frequency signals

We are sure that the vast majority of signals heard off-frequency from British stations are produced unintentionally by carelessness or ignorance, and it is to such operators we address our appeal. *Please* do not risk straying from your lawful territory if you are not sure of your *exact* frequency. You may get a warning from the GPO listening post, or from some other responsible body—treat this constructively and take steps to be more careful in future. Most modern commercial superheterodyne receivers will measure the edge of the bands to within 5 kc or less, so it is risky to "chance it" when so many amateurs may hear you. If you do manage to raise something unusual by working off-frequency, you may depend there are many who have noted it, and they will form a very bad impression of your sporting spirit, because, whether it was accidental or intentional, the listening crowd will think the worst of you!

Still talking of band edges reminds us of the large numbers of amateurs who are heard calling "Test" on the extreme ends. This practice causes more QRM in the most crowded portions of the band, and does not give the operator his best chance of receiving a reply. Choose your frequency for calling "Test" at least 30 kc inside our British tolerances. Although it is not law, it is nevertheless accepted practice to use the band edges for calling-up purposes. There is another point to consider; if you call "Test" well inside, there is a good possibility of receiving replies on or near your own frequency; this has many advantages as the maximum QRM of the band edges will not be present.

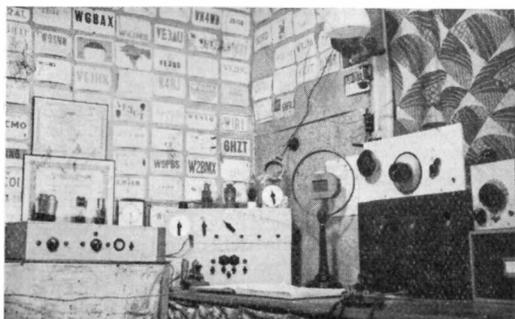
● Several crystals needed

If you use crystal control and wish to work seriously on 14 Mc, it will be necessary to have several crystals of varying frequencies available to obtain the best possible results, and to contribute your share of good ham spirit for the other users of this band. If ECO is employed (see last month's "Amateur Bands") this difficulty is solved, but the dangers of off-frequency working at once present themselves. Enclosed type crystals of reliable make will give you the necessary peace of mind.

Before we leave 14 Mc and CW, we would like to mention the letter from G3CT that appeared in last month's Magazine. He draws our attention to the relatively unpopulated state of the range 14,000-14,150 kc, due no doubt to the use of this portion by telephony stations. Are we really to believe that QRM from 'phones prevents us reading CW? A modern superhet with crystal filter will ignore the 'phones almost entirely—give this portion another trial and relieve the HF end of its present congestion.

● G2QY

This neat lay-out belongs to G. P. Anderson, G2QY of Mill Hill, and looking from left to right we see the speech amplifier; the 3-stage CC transmitter which radiates on all frequencies from 7 to 56 Mc, complete with power pack immediately



below; his home-made microphone; the 28 and 56 Mc receiver sitting on top of the normal receiver and a super-regenerative one for 56 Mc. Judging by the cards and certificates on the wall, G2QY has had his fair share of 14 Mc DX.

● The "2BI" aerial

G2SO of Leigh-on-Sea, Essex has erected the "2BI" aerial as described by G3GH in the October SHORT-WAVE MAGAZINE. The top is 33-ft. with a 47-ft. feeder coupled direct to a 6L6G tritet and '10 PA. The volts used were 350 and in one week in November he worked ZE, ZS, ZL1-2, ZBI, VU, VK, TF, FA and W's—all on 14 Mc. He feels that these results are largely due to G3GH for allowing the details of her aerial system to be published and wishes to record his thanks to her. G2SO tells us that the Southend amateurs are shortly to hold their annual "120-volt QRP Contest," and will appreciate reports on their signals.

G6AQ defends ham spirit by saying, "Mr. Spooner is of the opinion that ham spirit does not exist between amateurs of different nations. From my experience, visits from foreign amateurs to this country frequently take place and they are always 'FB' fellows. It is not the fault of the amateurs that in certain countries the art is not encouraged, the individual has no choice in the matter. Regarding religion, class or colour, these are purely personal affairs and do not interfere with world friendships.

"In the event of war, our stations would be closed and the chance to use them voluntarily as the tool of selfish nationalistic interests would be impossible. The question of patriotism does not arise, as it is human nature to defend those whom we hold most dear.

"I hope the above will correct the somewhat erroneous impression which I fear the letter of G2NS may have created."

1.7 Mc Reports Wanted

J. Morris Casey (G8JC), who is working on 1796 kc, would like reports with full details covering at least ten listening periods. Mr. Casey's address is 1 School Road, Coalbrookdale, Ironbridge, Shropshire.

Notes and News from India

Reported by VU2EU

ANOTHER VK/ZL Contest has passed and despite the bad conditions, especially during the junior section, most of the entrants appear to have enjoyed themselves. The senior section was blessed with much better conditions than the junior and it is believed that some very high scores were made, judging by the serial numbers of some of the stations heard.

The first weekend of the junior section opened with a flourish for VU stations and a number of VK and ZL stations were contacted over seven hours, but after that there was hardly anything doing until 0800 on the Sunday. Conditions during the second weekend were even worse than the first, but VU2EU managed to pile up the useful score of 2,904 points; no other VU scores are known, although a number of them were heard working in the Contest. VU2EO and VU2FZ put in a rather belated appearance during the second weekend of the junior section.

VU2ED and VU2EU have erected a 67-ft. multi-band aerial for 7, 14 and 28 Mc. Results at the former have been very satisfactory but due to trouble in the PA stage VU2ED has not been able to give it a proper trial. VU2EU is also testing 'phone, using a pair of PX4's to plate-modulate his 25L6's; he would appreciate reports on these transmissions. QSLs should be sent direct and all correct reports will be confirmed.

BERS399 has joined VU2EU in Meerut prior to his return to England early in 1939, when he hopes to be active under a G call.

● New Stations

A new station worked is ZE2JB on the HF end of 14 Mc. It appears that all the ZE1 prefixes have been used up and they have started on ZE2, but no definite information could be obtained. QSL's should be sent to:—Jamieson, Box 796, Salisbury, Southern Rhodesia.

VU2EB is back on the air again and cards should be sent c/o 1st Indian Divisional Signals, Rawalpindi. Another new station is VU2WW, while VU2KK is working some good DX with a pair of 6L6's running from DC mains. Both these stations are in Waziristan, but cards can be sent via VU2EU.

On October 9 a certain GW5 was heard calling "Test DX" at RST579. VU2EU replied, only to find on changing over that the GW5 had started to work a GW3. What a waste when DX is coming through!

W's are showing up again during the early morning and evening and a number of contacts have been made with the States. G6WY was heard calling "Test" at the unusual hour of 0840 GMT (1410 IST).

QUERIES

We have to point out once again that queries requiring a reply must be accompanied by the coupon cut from the current issue and a 1½d. stamp.

The Cathode-Ray Tube—II.

Operation — Deflector Circuit — Deflection Sensitivity

By A. F. Hollins

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

The *brightness* of the image depends upon the magnitude and velocity of the electron stream. The *sharpness* or focus of the image depends upon the ratio of the voltages applied to the first and second anodes. Therefore, since the second anode voltage (which controls the velocity of the electron stream) is normally a fixed value, adjustment is made to the brightness of the image by increasing the beam current, which is controlled by the grid bias.

However, in making this adjustment it must be borne in mind that by increasing the current density of the beam the negative space charge within the beam is also increased with the result that the spot size tends to increase as well, so that for the observation of any phenomena which requires a fine trace for its accurate interpretation, the beam current should be maintained at the minimum value consistent with the required brilliance.

● The deflector circuit

For accurate interpretation of the image on the screen, and for an exact appreciation of the magnitudes involved, it is necessary that the deflector plate characteristics should be fully understood, and it is intended for this reason to deal with these characteristics at some length.

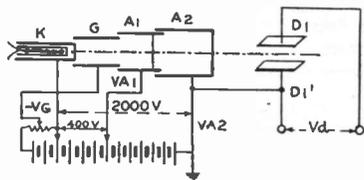


FIG. 4.

Theoretical circuit of HT connections, showing relative potential differences between the electrodes and deflector plates. Battery supply is shown for simplicity.

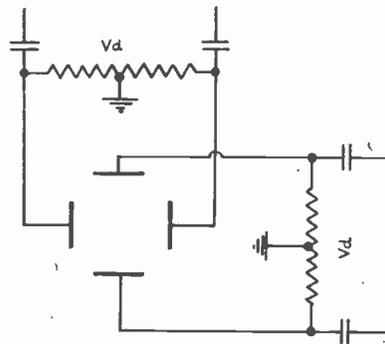
It can be stated that the deflection sensitivity of the type of tube being considered will vary inversely as the velocity of the electron stream which, as stated, is determined by the second anode voltage. That is to say that as the second anode voltage is increased, the voltage necessary across the deflector plates for a given displacement of the spot at the screen must also be increased, in approximately the same proportion.

Considering now the circuit diagram shown at Fig. 4 which in principle is a normal type of circuit in common use, it will be observed that one of the deflecting plates D1' is connected to earth and will always therefore be at the same potential as the second anode, but as soon as a voltage V_d is applied between the plates, then the opposite plate will have applied to it a voltage which is either higher or lower than the anode voltage. The electron stream

therefore in passing through this pair of plates undergoes a change of velocity, and this in turn changes the deflection sensitivity of the tube. It follows from this that the deflection of the spot at the screen is no longer proportional to the voltage V_d and the image becomes distorted.

In considering a single pair of deflector plates the above effect by itself merely causes a greater displacement of the spot from the zero axis when a negative voltage is applied to the free plate than when a positive voltage is applied. However, as the two pairs of plates are positioned at different distances from the anode, and the beam passes first through one pair and then through the other, the second pair of plates introduces a further error by affecting the velocity of the beam as deflected by the first pair, and a form of distortion is introduced which is commonly known as trapezium distortion.

In addition to this form of distortion, the use of such a circuit as that shown in Fig. 4 would influence the definition of the light spot. If the spot is correctly adjusted when $V_d = 0$ it will become ill-defined and larger for values of V_d corresponding to a wide angle of deflection.



Method of balanced circuit supply to deflector plates.

FIG. 5.

In order to overcome both of these forms of distortion, the plates should be connected in symmetrical push-pull arrangement as shown in Fig. 5 in which both plates of a pair are connected to the anode through an impedance of equal value, and oscillate in potential symmetrically about the earth potential of the anode.

Recently, the Mullard Company have introduced a special type of Cathode-Ray Tube, the design of which is such that one pair of deflector plates may be used on an unbalanced circuit without introducing appreciable distortion of the image.

● Deflection Sensitivity

The deflection sensitivity is usually expressed as the deflection in millimetres at the screen per volt DC between the plates, at a given anode voltage; but since, as has already been stated, it is inversely proportional to the final anode voltage, it may also be expressed as $\frac{X}{V_a}$ mm. per volt, where V_a is the final anode voltage. Thus tube Type E.40-G3, with a sensitivity of 0.19 mm. per volt at 800 v. anode voltage might be quoted as having a deflection constant of $\frac{150}{V_a}$ mm. per volt approx. But whichever way it is expressed, it must be remembered that the figure given should refer to a specific pair of plates, since the deflection sensitivity is different for each pair, the plates further from the screen having the higher sensitivity.

To consider a practical case, supposing tube type E.40-G3 is connected up and is operating at a deflection sensitivity of .3 mm. per volt. Fig. 6 shows what happens under operating conditions.

With the plates all connected together to the second anode, the spot should be in the exact centre of all four plates. Now, on connecting a battery of

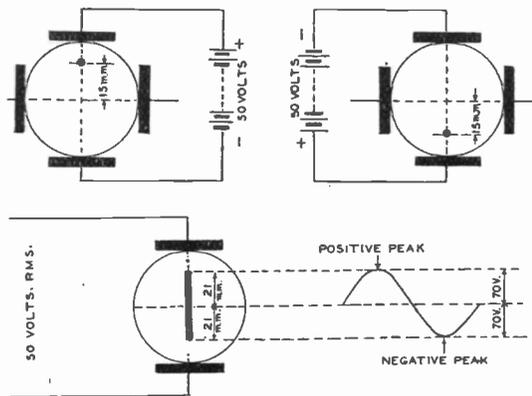


FIG. 6.

Deflection characteristics.

Showing relative movement of spot by DC and AC.

say 50 volts between the vertical plates the spot will move towards the positive plate, the amount of movement being proportional to the applied voltage; on reversing the battery the deflection would be in the reverse direction, and in the same proportion, so that the spot would first move a distance of $50 \times 0.3 = 15$ mm. from the centre of the screen, in one direction, and on reversing the battery, 15 mm. in the opposite direction.

If, now, instead of using a battery an AC voltage of 50 volts is connected to the plates, the spot will move rapidly to and fro at the periodicity of the mains and since these alternations cannot be followed individually by the eye they appear on the screen as a line. Now the important point to remember about this line is that its length is proportional to the *peak* value of the voltage: hence, since the deflection takes place alternately in two

directions the length of the line will be approximately $1.4 \times 50 \times 2 \times 0.3 = 42$ millimetres.

From the above, the following data becomes available, where D = screen diameter in inches and S = sensitivity in mm. per volt.

$$\text{DC voltage required per inch deflection} = \frac{25.4}{S}$$

$$\text{RMS voltage required per inch deflection} = \frac{25.4}{\sqrt{2} \times 2S}$$

volts, so that the RMS voltage required for full sweep of the tube = $\frac{D \times 25.4}{\sqrt{2} \times 2S}$, or approximately $\frac{D \times 9}{S}$.

In dealing with an irregular waveform, such as for instance the output from a gramophone pickup, it is the peak voltage which is of interest and the peak voltage necessary per inch deflection = $\frac{25.4}{2S}$.

Obviously, in estimating the length of line which would be produced by a given voltage the reciprocal of the above figures would be used.

(To be continued.)

* * * *

EDITORIAL NOTE.—It is intended in this series of articles on the cathode-ray tube and oscillographic work in general to cover those practical aspects of C.R. tube applications which are of interest from the amateur point of view.

A great deal of extremely useful and interesting work can be done with a simple oscilloscope, even without a time-base, and its application is by no means limited to the measurement of the depth of modulation of one's carrier. Not only every stage of the transmitter, but much of the receiver circuit, can be tested and once the principle of operation of cathode-ray equipment has been grasped, it is possible to devise methods of using it to tackle particular problems and to apply it to purposes hitherto unrealised.

While much can be done on a small tube without a time-base, the real value of an oscilloscope in the strict sense of the term lies in using a fairly large tube with its associated time-base. The former point is evident when it is remembered that many tests involve actual measurement of the image on the screen; thus, the larger the scale, the greater the accuracy.

Articles to follow will deal with the interpretation of simple images and the arrangement of time-base circuits, leading up to the design and construction of a complete oscilloscope for use in the amateur station, with a careful summary of the work which can be done with it. Many amateurs have already found out for themselves that oscillography applied to radio is a study in itself, and it can be truly said that every up-to-date amateur should be equipped with a C.R. tube unit as surely as he has installed his frequency meter and other monitoring apparatus.

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Transmission for Beginners—10

More about ECO—Modulation Experiments—Monitoring

By A. A. Mawse

THERE ARE two matters to be concluded this month: The first being final notes dealing with ECO operation as outlined in article 9, followed by initial experiences in modulating—working to the theoretical circuit and introduction, which were also dealt with in November.

● More about ECO

As progress is made along the lines we are following it becomes more apparent than ever that the written word is of itself often insufficient as an explanation—because of the hundred-and-one little touches and tests that can only be learned by experience. The novice who is in the happy position of working with an "Old Timer" will know that long before the aerial is connected there is a preparatory period of methodical monitoring, testing, etc., so that when the stage of making QSO's is reached (which is even then very far from finality), full attention can be given to the contact, with no apologies required as the transmission proceeds, nor questions of the other station such as "What is my frequency?", or if it happens to be telephony, "Do you think I'm over-modulating?" With proper attention to the monitoring side, and even with the simplest equipment, it is possible to go on the air knowing exactly how the transmission should sound at the other end, the only information required about the signal at a distant point being its strength.

Such preliminary adjustments are still more important where ECO is used. See that everything is earthed up carefully then let us note one or two indications before leaving ECO for a while.

Set the transmitter for CO on 7 Mc first and listen to the note from the monitor or frequency meter (which should be "warmed up" for a period beforehand) with the object of getting the crystal-control characteristic firmly in mind. Now switch to ECO and tune the cathode to the crystal frequency so that a quick change-over will show quality comparisons. As the whole process of tuning and so forth has been dealt with earlier we will not here talk about the getting of a clean note.

Tune the monitor to silent point (zero beat) and listen for creep—this setting of the monitor should be really silent—and if there is a tendency for the "edge" of the note to be heard as the transmitter is keyed, then the frequency is shifting slightly and the effect is a chirp. If, however, the zero beat setting shows the signal to be clean cut, everything is as it should be. The effect of instability may be obtained by placing one's hand near the cathode condenser or coil, which, incidentally, also shows how this side of the circuit affects the frequency.

To sum up, the aim should be to obtain as good a note on ECO as on crystal.

● Tuning the PA

Arrange the transmitter for ECO/PA (3.5, 7, 14 Mc) and plug the key into the PA plate jack so that the ECO side is oscillating continuously. Listen for silent-point on the monitor and then, by the very slightest of touches, with the key down, bring the PA dead in tune with the drive side. When this is done move the monitor just off zero and with key up listen to the ECO; then by keying the PA both notes should be equally pitched. There is a "pulling" effect between the tuning of the two tanks, but this draw does not occur until the two circuits are very near resonance and is hardly discernible by ear. Place the key back in ECO screen, the meter in PA plate and then, when the frequency is changed by adjustment of the cathode tuning, the PA will automatically follow, due to the fact that resonance setting of the PA and ECO tanks is much flatter than the cathode side of the ECO. There is, of course, a point reached when moving the cathode setting too far away results in a drop in RF output due to the tank sides getting out of resonance—but it should be possible to move at least plus and minus 20 kc.

● Low-Power Modulation

There is very little to say about the practical side of the circuit given last month. The whole arrangement worked out exactly as suggested and according to the theory then given, although PA plate current had to be brought down to 20 mA, which figure showed four watts input, making possible some interesting 'phone tests. Here the 'phone monitor became extremely useful, and with the AA load on, the BC set downstairs, tuned to the 7 Mc band, also served out the signal.

The notes last month on checking for the depth of control should be re-read. Because you hear a very loud signal on a local receiver, it does not necessarily mean that you are getting even fairly deep modulation.

Bias on the PA was reduced to -30 volts to compensate for the drop in HT, and the components shown in the circuit diagram, Fig. 2 on p. 10 of the November issue (Varley "Standard" Choke and CP62 resistor, Eddystone RFC, Dubilier LSA 2 mF condenser) were temporarily mounted upon the amplifier chassis.

As the pentode output valve of the two-stage amplifier will not, as expected, modulate more than a four- or five-watt carrier, it has been decided to add a modulator stage proper, to be driven from the amplifier, the output of which will then fully modulate a ten-watt carrier. This is to be a separate unit and details will follow next month.

1000 Volts 250 Milliamps

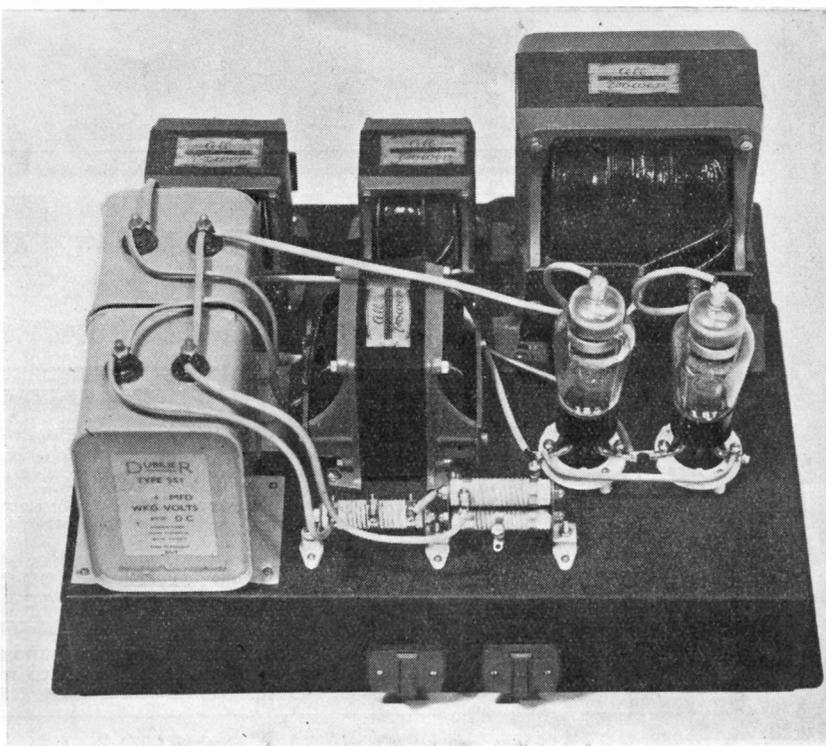
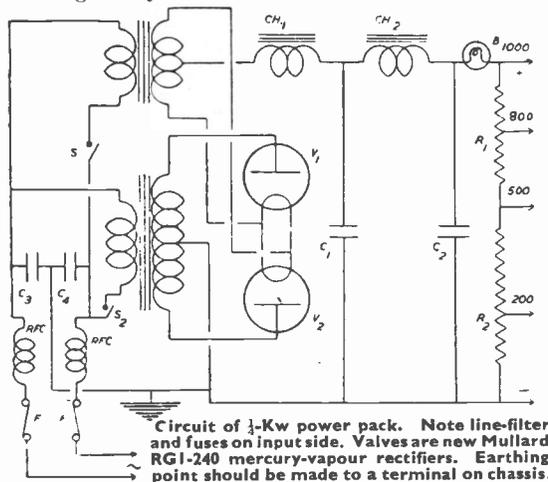
*Ample Smoothing —
PDC Output — Good
Regulation — Variable
Taps*

By "Tester"

THE POWER PACK described here is a useful unit for a variety of purposes, from running a 100-watt PA stage or high-power modulator to operating a cathode-ray tube, though in the latter case its current output capabilities are of course rather wasted.

As can be seen from the photograph and circuit diagram, the bleeder consists of a pair of power resistors in series, so that the output voltage can be tapped down as required, while the rating of R1 and R2 is such that useful current loads can be put on the bleeder at intermediate voltages without overloading it. R1 is 20,000 ohms, Bulgin 40-watt type, and R2 a tapped resistor of the same value and make, rated 30 watts. These resistors are provided with locking clips and terminals, which can be set in any position, hence different voltages can be taken off, at loadings up to 20 watts or so for R1 and 10 watts for R2. Where it might be desired to obtain still greater outputs at voltages lower than the maximum, it is only a matter of putting in a bleeder of higher wattage rating, allowing about 20 watts for bleeder dissipation, i.e., this load is always present as a steady draw.

The transformers and chokes are by Messrs. All Power, who turn out a splendid job well up to rating and rigorously tested for insulation, which is so



important for high-voltage apparatus. The circuit arrangement is quite conventional in its main details, but note the fuses and filter on the input side, also the fuse bulb B in the HT positive lead. It is advisable to mount the latter in the run of the wiring, as its insulation from the chassis—with the ordinary type of holder—presents some difficulty. A pilot-light on the LT side is impracticable for the same reason, since there is a peak voltage higher than the output for which allowance must be made.

Rectification is by mercury-vapour rectifier, using the new Mullard RG1-240 valves, which are generously rated and do very well in this service.

● Important !

When using mercury-vapour rectifiers of any type, it is *essential* to switch on the LT first, and let the valves run for a few minutes before applying HT. i.e., switch S must be closed first, then, a little later, S2. When shutting down, HT should come off before the LT. It is also advisable when using new valves—or if the pack has been standing idle for some time—to give them a run of a quarter of an hour or so on LT only.

The unit should be handled with respect, and the bleeder examined from time to time—not with the HT on—to make sure it has not broken down, otherwise the smoothing condensers cannot discharge. The latter are Dubilier type 951, 4 mF capacity, rated at 2000 volts DC working.

Other parts to mention are the chassis, a Scott-Sessions product 16-ins. by 12-ins. by 3½-ins. deep, the input choke Ch. 1, 2.5 henry 250 mA, the smoothing choke Ch.2, 15 henry 250 mA, LT transformer 2-0-2 volts 7 amps, and the main transformer 1250-0-1250 volts 250 mA. C3, C4, can be 0.1 mF condensers of the ordinary rating, RFC's 200 turns of No. 16 on 2-in. diameter Paxolin formers, and the fuses F, F, Bulgin 1.5 amp. in their type F.11. fuse-holder. Switches can be any suitable for the mains voltage, such as the ordinary "5-amp." type, with a Clix plug and socket to bring the mains.

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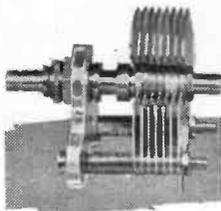
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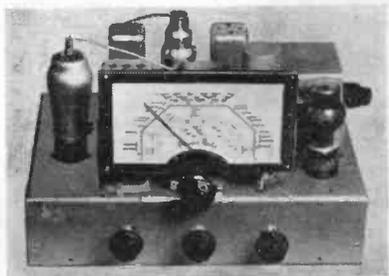
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A 5-Valve All-wave Superhet Receiver chassis with moving coil speaker. Wave-range 16-50, 200-560 and 800-2,000 metres. Output 4½ watts. Fully illuminated scale with Station Names and Wavelengths. Automatic volume control. Tone control. Provision for gramophone input. Extension speaker sockets. International Octal valves. Complete with valves and speaker ... **£6-6-0.**

A 6-Valve All-wave Superhet as above, but with R.F. Amplifier Stage, 4-wave-bands from 12 metres upwards, 10½ in. Moving Coil Speaker. With valves and speaker ... **£7-19-6.**

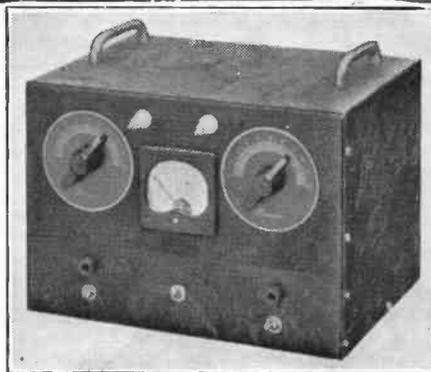
PREMIER L.T. TRANSFORMERS

All Primaries tapped 200-250 volts. Between winding insulation 1,000 volts.

2.5 v., 8 amps CT. ...	8/6
4 v., 5 " CT. ...	9/6
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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
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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

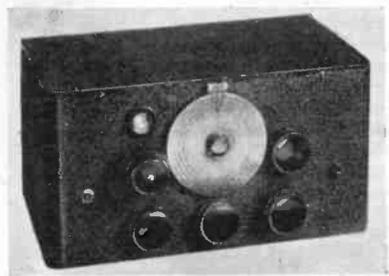


The NEW PREMIER 10-15 WATT ALL-BAND TRANSMITTER

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 modulator, 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 and 14 mc. operation ... **£10-10-0**
 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
- Iron-cored IF's
- Phone Jack
- Over 4-watts Output
- Illuminated Band-Spread Dial

Provision for single wire or Di-pole 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**

CORRESPONDENCE

The Editor invites comment on the views expressed.

Far North

You may be interested to know that my station is the only one in Orkney and I believe the most northerly amateur QRA in the British Isles. I am on 220-volt DC mains and the rig is 6A6-6A6 on 7064 kc, the best contacts to date being W1-2 with a $\frac{1}{2}$ -wave Zepp fed Hertz. Nearly all my QSOs are over distances exceeding 300 miles, and the average works out at 500-600, all on 7 Mc.

I am of course definitely QRP, but I can understand the desire of many people to increase power to 50 watts when I try and make a 7 Mc QSO from here on a Sunday morning!

The receiver is a Murphy D36 with electrical bandspread, which oscillates for CW reception by lifting the first screening can a couple of inches! I shall be on 'phone shortly, and all reports of *value* will be acknowledged.—J. CRITCHLEY GRAHAM, GM3TR, Air Ministry Control Station, Wideford Aerodrome, Kirkwall, Orkney.

Refutation

With reference to the report of receiver tests at G2ZV in your November 56 Mc Notes may I, as the designer of the resonant-line 3-stage set mentioned, offer a few observations. The tests were carried out on CW signals from G2OD, and as 2DDD's 1-v-1 has an Acorn RF stage, it is only to be expected that signal strength would be better; my third stage is optional quench, so it was a comparison of 0-v-1 against 1-v-1. I was not present at the tests in question, but so far as I know no experiments were made on signal/noise ratio or stability.

If any of your readers consider building a resonant-line 56 Mc receiver, I would advise them to give it a reasonable trial as considerable practice is needed before maximum results can be expected.—G. HOOK, 2CIL, 195 Crawley Road, Horsham, Sussex.

Piracy

I am continually receiving cards from stations which have obviously worked a pirate using my call, since I have been inactive since July and will not be on again till the New Year. As I cannot notify the victims individually owing to the numbers involved, I should be glad if you would publish the facts.—G. BLACKALL, G3LI, 7 Queens Road, Shipley, Yorks.

Is it fair?

In your October issue, there were roughly 50 columns of reading matter, of which only five were devoted to the BCL, amateurs, experimenters, and constructional articles claiming the rest. Is this fair to those of your readers not interested in the "dah-dit-dah-dit" nuisance? By the way, I hope you have not forgotten the suggestion to print "Guide to the World's SW Broadcasters" in booklet form.—T. P. BYRNE, 54 Lower Kevin Street, Dublin, I.F.S.

To A. A. Mawse

I was interested in A. A. Mawse's November article, because I use the system of ECO switching and drive suggested by him. But I very much disagree with his statements regarding 'phone with ECO, and with the transmitter arrangement I operate (6L6-89-P/P RK25) I will disprove practically everything he says if he cares to make a schedule on 7 Mc for any Saturday or Sunday. The ECO will be tuned to the crystal frequency, leaving him to guess which system of control is being used. The average depth of modulation is about 85 per cent.

While I do agree that there *are* many very poor 'phone transmissions with ECO drive, "pernicious practice" is another matter.—JAMES TROY, GM8RJ, 35 Hermiston Avenue, Springboig, Glasgow, E.2.

[While we thank GM8RJ for his very sporting offer, and fully accept his contention as to the performance of his own rig, the fact is that he has missed the point made by A. A. Mawse that modulation should not be attempted with a two-stage ECO-driven transmitter; our correspondent has a buffer stage, with which, as clearly implied in the article, 'phone work is possible when the dangers of instability are understood and precautions taken against them. It is very evident that telephony with ECO requires a good deal of care, whatever the transmitter in use. But it is the exception which proves the rule, and GM8RJ is one of these in that his equipment works well where other similar ones might not.—Ed.]

Echoes of a Famous Incident

I was interested to see in November "Have You Heard?" that a correspondent mentioned having met a lady at Georgetown, British Guiana, who was acquainted with the staffs of the local BC stations, whom I also know. We lay in the harbour at Georgetown for some time, having a stamp (designed by the crew) printed for taking mail to London, where the ship was subsequently open for public inspection.—G. D. ELLIOTT, Engineer "Girl Pat," Castlefin, Co. Donegal, Ireland.

Amateur Emergency Communication

It is high time everyone realised that the only way to avert a certain form of trouble is to be prepared for it. Armistice Day means little or nothing to the younger generation, so stuffed with Hollywood excretions that it is beginning to believe that, if the British Army was in the Great War at all, it was one glorious "binge" jollified by sing-songs, mademoiselles and other similar amusing diversions. The needless horror, misery and destruction—far more real—is forgotten when youngsters are only told the wrong side of the story.

No amateur free from other Service commitments should hesitate to show his willingness to be trained for either the R.N.W.A.R., C.W.R. or your proposed E.C.S., all of which will contribute towards "peace in our time."—N. P. SPOONER, G2NS, White Cottage, Rowena Road, Southbourne, Bournemouth.

The Other Man's Station

G5OH

IN THE very early days, Bournemouth gave birth to a famous BBC station. It also saw, in 1921, the beginnings of the urge in R. P. Heatley, G5OH, 26, The Triangle, who startled the town with a valve amplifier and is still as glad to welcome visitors as he was then.

After a spell of commercial experience which took him all over the world operating many diverse types of gear, he settled down to Amateur Radio as G5OH, using a PX4 in a Hartley circuit.

A process of evolution through transmitters of all kinds has brought G5OH to the very fine rig shown in our photograph, consisting of 6L6-TZ20-860 in the rack-and-panel assembly on the right, jacked for keying or metering in any stage, and with the modulating equipment on the table alongside. A crystal microphone feeds into a five-stage speech amplifier having an audio output of 6 watts; this can be applied either for grid control of the 860 final or for plate-modulating the TZ20 buffer. In the latter case, the PA is run in Class-B, with audio and RF drive in combination. For direct plate control of the 860, the audio amplifier already men-



tioned pushes a pair of zero-bias 203Z's in a Class-B unit, giving about 300 watts of audio.

The operating table shows that G5OH checks up properly—which in fact he would need to do on such a complex high-quality rig—with an oscilloscope, also used for getting pictures of incoming transmissions, while the receiver is a Hallicrafter Super Skyrider with a 2-v-1 as stand-by. Though many aerial systems have been tried, the usual ones are either a Zepp-fed Hertz or a Windom; the tuning network can be seen half-way up the window.

Separate power supplies are used for each stage of transmitter and modulator units, the finish is battleship-grey with glass sides to the rack, and break-in operation is provided for by keying the CO.

Some Peto-Scott Products

The new slow-motion dial developed by Messrs. Peto-Scott Co., Ltd., 77 City Road, London, E.C.1, for their Trophy range of receivers is a useful piece of equipment which can be obtained as a single item. A composition rubber band drives a train of split gears, which ensures complete freedom from back-lash, positive action and a powerful drive, wear being compensated for automatically; two-speed pointers revolve against a circular scale. The construction is very solid, and we can unhesitatingly recommend this dial as a sound job. With finer pointers and a really accurately divided scale with closer markings, at its price of 12s. 6d. it would challenge anything yet produced in the way of slow-motion controls.

For those wanting a reasonably-priced microphone capable of good speech quality, the Peto-Scott instrument represents value for money at 25s. It is supplied complete with cable and matching transformer, is of transverse-current type and therefore sensitive, while its finish will enhance the appearance of the operating room. On test, speech reproduction was found to be very good with the absolute minimum of carbon "background." An excitation voltage of 9v. is recommended and can usually be taken from a bias battery.

The Magazine Certificate

We have decided to inaugurate a Magazine Award in the form of a Certificate of Merit, to be granted to the winners in contests we may organise, for outstanding contributions to the paper, for technical and experimental work generally in any sphere of Amateur Radio whether published or not, and for important services to the Amateur cause.

The value of the Certificate will lie not in its intrinsic worth or beauty of appearance, but in the fact that an Award will only be made where the recipient shows exceptional ability in one or other of the categories mentioned.

The granting of the Certificate of Merit will be at the sole discretion of the Editor, and a list of holders will appear in the Magazine from time to time.

Read "The Short-Wave Magazine" regularly for the latest news

The Two-Band Two

By

Austin Forsyth, G6FO

(Editor)



DESCRIBED AND ILLUSTRATED here is a two-stage transmitter which, called the "Two-Band-Two," can be operated on any frequency, including those used by the R.N.W.A.R. and C.W.R. Though 7 and 14 Mc working is discussed in detail, it is only a matter of selecting crystals and winding appropriate coils to get output on any band from 1.7 to 56 Mc.

The points to watch in this connection are that values have been arranged to give optimum performance on the two most popular bands—hence there will be a falling off in RF efficiency at the HF and LF ends of the Amateur range—while the transmitter should not be expected to work really well on more than two bands from one crystal, though the first stage *will* give fourth-harmonic drive, i.e., quite good 28 Mc output is obtainable with the PA operated as a straight amplifier, using a 7 Mc crystal with V1 quadrupling.

It is necessary to reiterate here, emphasising the foregoing remarks, that it is not possible to design a transmitter which will give absolutely level performance throughout the whole Amateur range, because each band has its own optimum L/C ratio on the tank side, while the same value of by-pass condenser will not be equally effective at all frequencies. Therefore, we are—as always—involved in the blessed state of compromise in order to obtain good average results.

● Circuit and Design

It will be seen that the circuit arrangement is quite straightforward, with variable capacity coupling (C6) between driver and amplifier, a feature which readers will have noticed we favour. It is true that on 28 and 56 Mc link-coupling between stages is better, but for working over the range 1.7 to 14 Mc, we have never been able to get improved drive with link-coupling as compared with capacity, provided that in the latter case leads are kept short and the grid side of the PA made as low-loss as possible; also, arranging matters for capacity coupling means that one tuned circuit is eliminated.

The driver side is shown connected for tritet working, but straight CO is arranged for by shorting out the cathode circuit, while ECO can be used by removing the crystal, plugging in a .0001 mF condenser in place of it, and replacing L1 with a coil having the cathode tap near the earthy end. The plug-in ECO coil and condenser is shown in the under-chassis photograph. Four-pin formers are used for both coils L1, which have their outsides across the filament pins. The cathode tap is taken to the grid pin of the holder and in the ECO coil, the tap is brought out to the grid prong. In the tritet coil, the grid and the appropriate filament prongs are wired together on the former itself, hence changing from tritet to ECO is simply a matter of plugging in the required coil.

● Components and Construction

The parts are all standard British high quality components, and can be relied upon in every respect. V1 is the very latest version of the Tungston APP4g—improved type with ceramic base—and the PA valve V2 the new Mullard TZ08-20, a triode which can be driven to 40-50 watts input and in this transmitter runs at a comfortable 25 watts when properly loaded and with 450-500 volts on the plate. The actual input can be varied over wide limits by adjustment of C6.

Looking at the heading photograph, the controls along the front of the chassis are cathode tuning, driver tank tuning (with the control knob for C6 between them), the four jacks—the meter being plugged into the driver plate jack J2—and the 0-50 mA Turner 2-in. instrument, this range being just right for the current values encountered; if necessary, it could be made to read double in the PA plate by means of a suitable shunt across J4.

Above the chassis, left to right, are the cathode coil with its ends brought to a terminal saddle just in front, shorted for CO working with an aluminium strip or wire loop; the Q.C.C. crystal holder and mount; APP4g driver stage, with the tank coil L2

APP4g-TZ08/20 — Incorporated LT and Metering — Compact Adaptable — All British

just behind; the Cyldon .0001 mF plate tank condenser C8 with its dial on a shortened Eddystone extension control (not showing in the view); the TZ08-20 PA valve behind; the neutralising condenser C9 just visible; and the very neat Denco coil assembly, L3 on the PA tank side.

As photographed, the transmitter was set up for 14 Mc operation with the driver in tritet, but the main condenser reading is nearer minimum.

The under-chassis view shows the placing of all components, and also the arranging of the four Clix "All-in" type terminals and the mains inlet. The Eddystone flexible coupler facilitates the placing of C6 right under the PA valveholder, and the resistor network R3-R6 is worked into the run of the wiring, with one end of R3 supported by a midget s/o insulator. The wiring is in Bulgin "Quikwyre," with 2 mm. systoflex sleeving where extra insulation is necessary, while low potential leads are bunched and bound.

The chassis is earthed at one point only, all the "earth returns" being made to the centre-taps of the LT transformer. This improves output and stability by preventing varying RF potentials across different parts of the chassis. Condensers C1 and C5 on their extension controls come close to their respective coils, and the condensers themselves are mounted on Eddystone pillar insulators with Meccano brackets. Two Denco RF chokes are used on the driver side, and an Eddystone choke in the grid of the PA.

Only eight leads pass through the chassis, and these are protected with Bulgin rubber grommets set in 1/4-in. diameter holes, with a larger one for that in the front panel.

Dubilier type 620 mica condensers, 1000 volts DC test, are used at C4 and C12, the cheaper 500 AC test type at C2, C3, and C7, with T.C.C. type M at C10 and C11. The jacks are Bulgin close-circuit, insulated from the chassis with countersunk bushes of the same make.

The ECO fixed capacity is a T.C.C. type M mounted on a pair of valve-pins, the centreing of the holes in the stiff tags of the condenser being just right for a snug fit in the Q.C.C. crystal holder.

● Adjustment and Keying

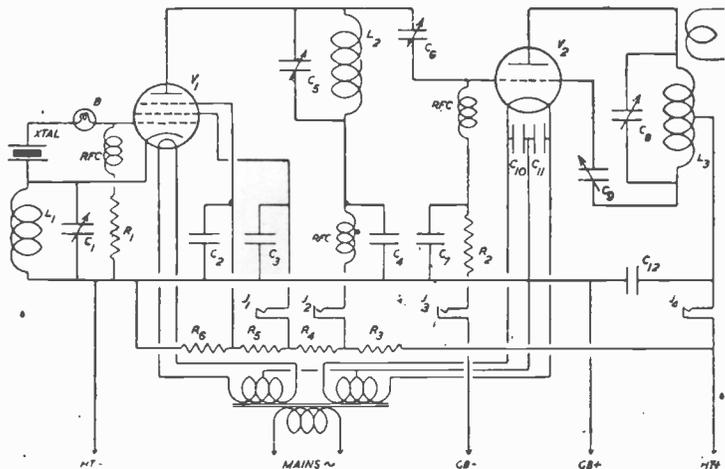
For 7 Mc operation, plug in the appropriate coils, join the terminals of the cathode-shorting "switch," and insert a blanking plug in J4. With the meter jacked in at J2, swing C5 till the crystal takes up and set the condenser so that on keying in J1, the crystal follows accurately. During this adjustment, C6 should be about two-thirds in mesh. Then plug the meter to J3 and note PA grid current; having previously set the PA bias at twice cut-off—which can be calculated by dividing the amplification factor of the TZ08-20 (25) into the plate voltage (say 500) giving a figure of 20 volts for cut-off; the bias voltage required for normal Class-C operation is therefore -40 volts.

Adjust C6 till the maximum grid current reading is obtained consistent with keeping the driver side "off the edge," and then neutralise the PA by swinging C8, noting the point at which the grid current dips, finally varying the neutralising condenser setting till there is no flicker of the grid meter needle as the PA tank is tuned backwards and forwards through resonance.

To bring the PA into action, pull the blanking plug out of J4, replace it with the meter, and tune to dead resonance (minimum plate mA).

For 14 Mc working, the driver stage is connected tritet by putting in the cathode coil and removing the shorting link, while the 14 Mc tanks are inserted at L2 and L3. Again with the blanking plug at J4 and the meter at J2, swing the cathode condenser C1 till the meter needle falls back, and then tune further away from this point towards the minimum setting of C1. The tank side of the driver is tuned to 14 Mc by noting the plate mA kick and checking with the absorption wavemeter, after which jacking the meter in at J3 will show grid current. This should be brought to a maximum by suitable adjust-

Complete circuit of the "Two-Band Two." Variable capacity coupling is used, giving smooth control of PA input. V1 is the new ceramic base APP4g, and V2 a Mullard TZ08-20. Keying is in the screen jack J1, and a small amount of positive voltage is applied to the suppressor-grid of the APP4g.



VALUES AND LIST OF PARTS FOR THE "TWO-BAND TWO"

C1—160 mmF, Eddystone, 1131.
 C2, C3, C7—.002 mF, Dubilier 620.
 C4, C12—.002 mF, Dubilier 620, 1000 v. Test.
 C10, C11—.002 mF, T.C.C., type M.
 C5—100 mmF, Eddystone, 1130.
 C6—50 mmF, J. B. double-spaced.
 C8—100 mmF, Cyldon T.R.1.
 C9—Neutralising, Eddystone, 1088.
 R1—25,000 ohm, 1-watt.
 R2—5,000 ohm, 3-watt.
 R3—6,000 ohm, 10-watt, Short-Wave Radio.
 R4—25,000 ohm, 5-watt.
 R5—40,000 ohm, 3-watt.
 R6—10,000 ohm, 2-watt.
 Valves, Tungstram APP4g, Mullard TZ08-20.
 4-pin holder, Eddystone 949.
 Four Clix "all-in" terminals.

Two 4-pin and one 7-pin Clix chassis-mounting holders.

One Clix type M plug and socket.

Four Bulgin jacks, J.7.

Three Bulgin plugs, P.38.

Q.C.C. crystal and holder.

One T.C.C. type M condenser, .0001 mF.

Eddystone extension controls, dials, flexible coupler, frequentite terminal saddle, insulating pillars, small s/o insulators, type 1022 RF choke.

Peto-Scott Aluminium Chassis, 14-ins. by 9-ins. by 4-ins. deep. Denco 7 and 14 Mc coils and one mount, two Denco RF chokes. All-Power LT transformer, 2-0-2 volts 4 amps, 3.75-0-3.75 volts 3-amp. Raymart coil formers. Turner model 909 0.50 mA meter.

ment of the driver side controls. Then neutralise the PA as before, and tune to dead resonance with the meter plugged to J4.

In ECO, the crystal mount is removed, the .0001 mF fixed condenser inserted across the crystal holder, the ECO coil plugged in at L1, and C1 adjusted till grid current is obtained with the other

controls as set for crystal drive. This will locate the right ECO drive frequency straight away, and further adjustments can be made in conjunction with the frequency-meter monitor.

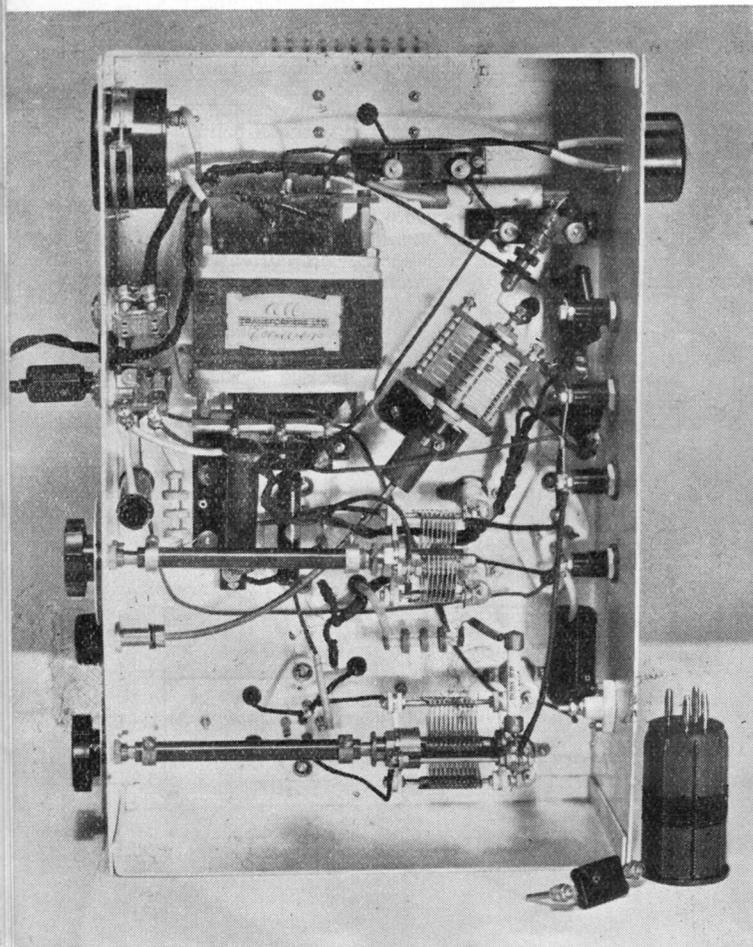
If the transmitter is built as illustrated, with the specified coil values, the note on ECO is almost indistinguishable from crystal—Yes! The driver tank C5/L2 should not be tuned to dead resonance, as this will tend to roughen the signal, and the aim should be to get first absolutely .PDC output, with the amount of drive a secondary consideration. Actually, on ECO with the cathode on 7 Mc—as in this case—the available drive is higher than with tritet operation. This is usual.

For 7 Mc ECO-driven output, the cathode side must be on 3.5 Mc, involving an 18-turn coil, tapped 3 turns from the earthy end. All other adjustments are as before.

By keying in J1, only a very small amount of power is broken, and clean clickless keying is a simple matter with the most elementary of filters. One point to watch here is to make sure that complete RF cut-off is obtained, i.e., with the key up the crystal should not go on oscillating, though there will be slight plate current. If cut-off is not complete, it can be made so by tuning C5 a *very little* off resonance, which will not affect the drive to any noticeable extent. Alternatively, reduce excitation by de-tuning C1 still further; this is the better method.

(Please turn to page 36.)

In the sub-space of the "Two-Band Two," showing lay-out of parts and general arrangement of wiring. Note the flexible coupler controlling the grid-excitation condenser C6. The coil and condenser in the foreground are for ECO operation.



Conditions—The Month's Survey

THE VERY LARGE sunspot mentioned in last month's survey (it was among the dozen largest ever recorded) disappeared over the sun's west limb on October 18. On October 10 its area was 2900-millionths of the sun's visible hemisphere. Although it was spectrohelioscopically examined on several days, very little activity was noted. This is interesting, for it probably accounts for the fact that no abnormal magnetic storms occurred during its transit, and that radio conditions remained quite stable.

They continued generally good until October 24, the 21 Mc American broadcast stations usually being strong signals and a certain amount of activity being noted in the 28 Mc Amateur band.

Several small sunspots crossed the central meridian between October 23 and 25, and, perhaps due to this, a deterioration set in on October 24. Although daylight reception continued fair to good, flutter fading was much in evidence after dark, and on some evenings nothing very intelligible was heard above 9 Mc by 2200 GMT.

This poor period continued until October 29, which day marked the beginning of an improvement. By October 30 conditions were very good and on October 31 the 26 Mc American broadcasters did not fade out till well after dark, and commercial stations on 21 Mc were good signals at 2230 GMT.

● UHF possibilities

It is interesting to note the *very* high frequencies which are optimum for daylight communication at this time of the year. Calculation from the noon critical frequency of the F2 layer shows that the maximum usable frequencies during the first week of November were of the order of 40 Mc, while, in practice, even higher frequencies might have yielded results.

Similar conditions prevailed until November 6, when a further deterioration occurred. As the sun was generally obscured by cloud at this time and observation not possible, no reason can be assigned for this. Several days of relatively poor conditions followed, particularly as far as evening reception of American stations, both amateur and broadcast, on the higher frequencies was concerned.

A notable feature of this period was the very good reception of South Americans on the 14 Mc amateur band, and of broadcasters on the 11 Mc and 9 Mc band. We think this is due to the fact that the optimum frequency for the transmission path to South America during our evening is a good deal higher than that for North America. When conditions are such that the optimum frequency for North American reception is moved far towards the low frequency end of the spectrum in the early evening, that for South America comes nearer to 11 Mc.

Conditions were good again on November 10, and on this day another very large sunspot made its meridian passage. Again it had not been observed to be spectroscopically active, and, although conditions on November 11 were sub-normal, possibly

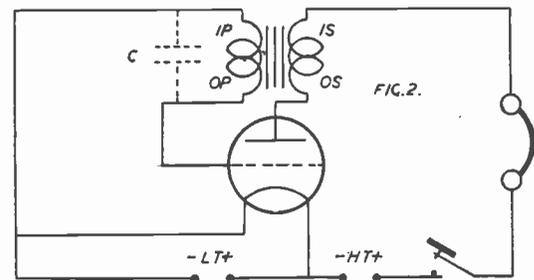
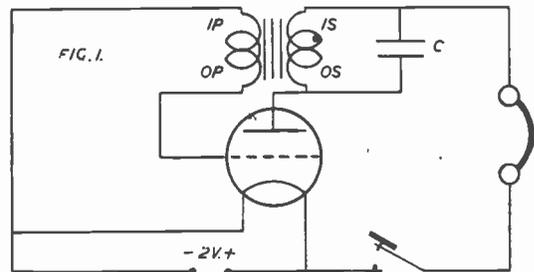
(Continued in next column.)

Still More Morse

By R. R. Haggard, 2BTF

When practising Morse a low-frequency oscillator, or "audio howler," will be found much better than a buzzer, as it can be made to give a note very similar to a CW signal. This is an important advantage when used in conjunction with the "learn by listening" method.

Two suitable circuits are shown. In Fig. 1 both LT and sufficient HT are obtained from the two-volt filament accumulator or dry battery. Though the HT is so low it is not difficult to obtain oscillation with a suitable valve, and the output is quite



sufficient for 'phones. It is best to try all the battery triodes available, to see which gives the best note, while the LF transformer can be the odd one to be found in every junk box. The pitch of the note can be varied by trying different condensers at C, or across IP and OP, as shown dotted.

Leads should be as short as possible, and if there is difficulty in making the valve oscillate, a small amount of HT can be added from a separate battery as shown in Fig. 2; in most cases a grid bias block will be sufficient.

due to its presence, the deterioration could hardly be called severe.

A small *magnetic* storm occurred on November 14 and the last two days of the period covered by this survey have been notable for the setting in of poor conditions shortly after dark, flutter fading being very prevalent. Possibly this condition was caused by the meridian passage of a number of small spots following the leader spot just mentioned.

Speech for Eighteenpence

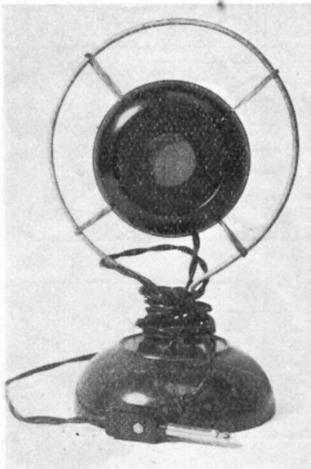
A Simple Microphone for the Home Constructor

By H. J. Hallet, G3CA

THE TRANSVERSE-CURRENT MICROPHONE described here can be made by any amateur, and requires the very minimum of skill and tools.

The body consists of a bakelite stamp-damping container which is obtainable, price 3d., from any Woolworth Stores; after removing the rubber sponge, four holes should be drilled right through in the small lower well. These should be spaced an equal distance apart in the form of a square, and countersunk on the inside.

Brass 4.BA screws are put through the holes, with their heads fitting the countersinking, held in



The home-made
microphone
complete.

position with nuts on the lower side, which now becomes the back of the microphone. When putting the nuts on, two strips of brass (or wire) should be arranged to connect electrically each diametrically opposite pair of screws, care being taken to see that the two pairs are mutually insulated. One screw on each should be left long enough to take terminals, to which the leads of the completed instrument are connected.

Returning to the front of the case, the shallow well, which is about 1/16th-ins. deep, should be filled—not packed tight—with carbon granules, and

a 2-in. diameter mica disc 1/1000th of an inch thick stuck over the well with a trace of "Durofix." Next, a disc of ebonite or plywood is shaped to fit inside the larger well, with a central 1-in. diameter hole in it. This ring is also stuck and pressed in tight to hold the mica diaphragm firmly in place.

A small disc of close-mesh wire gauze is laid on the ebonite ring, and a second similar ring placed over it. In the writer's case the two ebonite discs required were shaped up on a lathe, but there is no reason why they should not be cut out with a fret-saw. The wire gauze is obtained from a Woolworth's 3d. tea-strainer! However, they failed with carbon granules and mica sheet, which are available at a total cost of a shilling in the quantities required from a good dealer or disposals supply house.

Thus a microphone for about 1s. 6d.

● The Frills

If the reader is lavish with his finance, a very efficient stand can be made for another sixpence. This involves a further visit to Messrs. Woolworth's for a 3d. bakelite bowl which, when inverted, forms the base of the stand. Two holes are drilled in it, about one inch apart, and a circular frame formed with heavy-gauge iron wire, shaped to the required diameter. The two ends are bent down as supports and threaded with a die.

The stand is assembled by pressing each leg into the bakelite base, secured with a nut above and below, and the microphone is suspended by rubber bands. For this, it is necessary to drill four equidistant holes in the rim, the bands passing through these and round the frame of the stand.

EDITORIAL NOTE.—The completed instrument described above and illustrated here has been tested by us and was found to give quite good speech quality and to be reasonably sensitive. To get the best results with the minimum of "carbon hiss," some care is necessary with matching into the first stage of the amplifier, while various values of excitation voltage should be tried. The model shown had an average DC resistance of 600 ohms, so that four volts is ample. As a piece of home-constructed apparatus, easily and very cheaply made but yet working well, it is extremely effective and a tribute to our contributor's ingenuity.

Outstanding Value at 99s. 6d.

We have space here to mention only briefly two items which will interest many readers. The first is a 3-in. oscilloscope, with built-in power supply and 50-cycle sweep, complete in a neat crackle-finish cabinet. The deflector plates are brought out to side terminals and the design is such that effective screening is achieved. This instrument will do any amount of useful and interesting work on a transmitter, receiver or power unit, and is quite the cheapest oscilloscope of straightforward type now on the market.

The other piece of equipment is a complete single-

valve 25-watt CW transmitter, with incorporated power supply, meter, valves, coil and crystal, suitable for operation on any band 1.7 to 14 Mc, as specified. The parts are all assembled on a metal chassis, only the wiring being left to the purchaser. Full instructions are provided for this, and the transmitter can be connected in about three hours.

The RCO 3-in. Oscilloscope and the type CW.25 Transmitter are both products of Messrs. Radiomart, G5NI (Birmingham), Ltd., 44 Holloway Road, Birmingham, 1. Both are priced at £4 19s. 6d. only, and excellent business is being done in them.

... HERE AND THERE ...

Christmas Pudding

"Dear Editor,—On attempting to neutralise a new transmitter for the first time, a handful of bird-seed shot out and a card telling me I was impatient and optimistic fell into my lap. I carefully checked over the starting-handle, gas-regulator, baffle-plate and a whistle-filter (CW only), but everything appeared quite in order. I applied HT again, whereupon I was presented with a plate of burnt-out flash lamp bulbs on a flexible steel arm. Closer inspection revealed a bird's-nest in the tank coil. Has any other reader had a similar experience?"

[NO!—ED.]

British Valve Developments

Once again we are glad to be able to announce a new addition to the Mullard range. The TVO3-10 will be available shortly at a competitive price; as it is a husky version of the RK.34, a low-loss twin-triode of countless applications, many transmitters will be interested in the TVO3-10, which is particularly suitable for UHF work.

The new Tungram series of valves for amateur transmitters, data sheets on which are now in course of preparation, show a total of no less than 34 different types which not only meet the imported article on price but also include all the worth-while equivalents. Except in those types where filament or heater leads only are brought through the base, all these valves have ceramic bases. The applications of many of them will be described in forthcoming issues, and in the meantime readers can obtain full information by writing the Technical Service Dept., Messrs. Tungram Electric Lamp Works, Ltd., 82-84 Theobalds Road, London, W.C.1.

We are sure that readers will not only share our gratification at this positive evidence of the intention of leading British firms to come into the Amateur market in the manner for which we have been campaigning for many months, but also that they will support the British product now that it is readily available at the right price.

The Audio Side

Among amateurs of long standing, Messrs. R. A. Rothermel, Ltd., Canterbury Road, London, N.W.6, have been known for many years as suppliers of high-grade apparatus. The lines of particular interest now are Brush microphones and Centralab resistors; in the former, three new types are available with improved inserts, and prices have been reduced. The low-impedance model HM crystal microphone can be operated on a long cable without loss.

The Centralab booklet, free on request, will be most useful to all interested in 'phone, as it gives a great deal of sound information on LF circuits.

The February 1.7 Mc Tests

Entries so far received for the 1.7 Mc Trans-Atlantic Tests arranged for February next show much greater interest than last year, and it only remains for Old Man Conditions to give us his support too.

In order to focus more attention on the 1.7 Mc band to make the February Test Fortnight really

interesting, we have asked all European societies whose amateurs are licensed for the band to give us their co-operation in publicising the Tests for, as we have repeatedly pointed out in the Magazine, it is easy to work Europeans on 1.7 Mc when they do show up. At the moment, we cannot say how much support we shall have from the Continent, but the "regulars" will certainly be there, so that plenty of unusual contacts should be made even if the W's do not come over.

If you would like to take part, either as transmitter or listener, let us have that postcard now.

New Crystal Units

The New Malden firm has just brought out a new range of crystals and mounts; some of the former will give as much as 10 watts of RF on the fundamental and 6 to 8 on the second harmonic. Others represent an advance in accuracy and an improved temperature coefficient, while the mounted 100 kc bar is ground to within 25 cycles of the fundamental frequency.

The new Type U mount is a particularly neat piece of work; designed to fit a standard valve socket, it is only 1½-ins. in diameter by ½-in. deep, with ground stainless steel electrodes and a turned Keramot body. The price is 6s., slightly less if supplied with a crystal.

Messrs. Quartz Crystal Co., Ltd., Kingston Road, New Malden, Surrey, are now producing frequency control units which are above competition in design, accuracy, finish and price—and that goes for the whole world.

Correction

We much regret that in the November advertisement of Messrs. Woden Transformer Co., St. John's Square, Wolverhampton, we gave an incorrect price for the 500-0-500 volt, 150 mA instrument. It should be 26/6.

Rueda Del Oeste Again

We now hear from Mr. H. O. Crisp, Elstowe House, Pear Tree Green, Itchen, Southampton, as well as from several other readers who are members of the Western Association—represented in this country by Mr. Crisp—that it has not after all gone into liquidation. It seems that through the wicked machinations of certain ill-favoured persons of South American nationality, lying rumours were circulated that M. Felix Gunther, LU8AB, was giving up. These rumours involved documents and forged signatures, with every appearance of being authentic, so that Mr. Crisp asks us to correct his previous information with this notice.

More Pudding

"Dear Editor,—Knowing you are interested in wireless, here is an incident which occurred to me recently. I was adjusting my set preparatory to receiving a message when my arm came in contact with the lead-in. A spark thereupon passed from my finger to the nearest earth, with a noise like a large fuse blowing. Is this unusual and does it mean I was tuning-in to a powerful station?"

[Oh . . .—ED.]

Listeners'

DX Corner

By
The DX Scribe

The receiving position looks comfortable, and Gordon Lane, 31 Marriott Road, Coventry, uses the top 4-valve receiver for the short waves and the middle one is re-ramped for broadcast reception.



WE WILL BEGIN this month with a short discussion on logs. There are several suggestions we want to put to you, and some questions we would like answered. First, there is no doubt that our "Calls Heard" page is popular—so popular, in fact, that it is impossible to publish *all* the different logs we receive. We hope you understand that if your own is not included, it does not mean that it is a poor effort—far from it, but we just can't stretch space.

You will remember that we intend to publish calls under the headings of the six amateur bands, 1.7 to 56 Mc, choosing the best few submitted for each band. Now, the question we want answered is whether you want Set Listening Periods to be continued? We have had so many entries for the October SLP that we feel that you must decide if these are to go on. Please make sure when writing on other matters to say either "SLP—yes" or "SLP—no" and we will take a count and decide that way.

● Separate sheets, please

There has been an increasing tendency to put the results of listening on three or more bands on one sheet; will you kindly use *one sheet only for each band or listening period*, as this will help the Editorial Dept. Don't forget to write your name, call (or number) and address at the top of each page.

We are glad to find that the logs for 1.7 Mc have increased considerably, and many readers mention that amateurs always seem to appreciate the co-operation and reports of the SWL on this band. It is a good frequency on which to practise code too, as the QRM is less than on other bands and the sending is usually not too fast and fairly steady. Talking of "fists" brings us to the letter from D. C. Gordon (2FBT), "Verites," Charterhouse, Godalming, Surrey; he wishes to draw swords with 2AUK by saying, "I am afraid that I disagree with 2AUK's remarks on the subject of American amateur sending. It would appear that some of the W's sit down to dinner with a bug key beside them and just thump out anything in any old rhythm, whilst G's never really 'let it rip' even on a bug, and with a few exceptions, spacing is fairly good." What do you think, you speed merchants? Finally, 2FBT has a card from MX2A sent via MX2B.

Our prophecy that 28 Mc would produce all the rare American States during the month has come true. Besides these W's, 'phone has been heard from VK2GU and VK2HF, both on about 28250 kc, while 2AOU, Martin Bourke of Jersey, reports that he has logged AR4FT (a mysterious Syrian), FB8AA, J3FJ, VQ3TOM, XZ2EX, 7 VK's, 5 ZE's, and 7 ZS's, on CW. Further up the frequency scale we learn from Bob Everard that he received WQOE in Cleveland, Ohio, on approximately 41.5 Mc, quite near the Alexandra Palace sound transmissions, at S8-9 'phone.

● What is QRP (cont.)

Bob Everard considers that stations using up to 40 watts should come under the QRP class, even though your Scribe thinks that 10 watts should be the limiting input, but he is willing to stretch a point to Bob and allow up to 20 watts, who says that a station situated at 4,000 miles distance using 40 watts will probably have difficulty in forcing his way through QRM; but we still can't understand what QRP has to do with QRM! Either a station is QRP or he is not, and QRM will wipe out "kilowatters" as well. 20 watts to a W is "flea power," but to a G it is not considered as low power; we rate 1 watt as "flea power" and the 25-watt permit is known as a "high-power licence." Finally, Bob mentions hearing TA3JD in Ankara on 14 Mc several times. Has anyone else received this station?

Realising that QSL'ing information is appreciated by all ardent SWLs, we propose regularly to run a paragraph with the calls of the rarer stations who have obliged. S. F. M. Edwards has received

cards from K6OQE, W6NLS, W5BB, W5ENK, KA1YL, VK3HC and ZS6AA (28 Mc). C. G. Tilly of Bristol has been fortunate with CO2WW, 2RC, 7EV, ZS1AX, KA1BH, YV5AE, KAT7E, VO2N, VP4TK, VU2FS, VQ2HC, XU8RJ, XE2FC, W's 9EOZ (N.D.), 7APD, 7EYD, 60CH, 6CQS, 7EGV, 9WJJ (Col.), 7GPY, 6MWD, 60I, VK's 2NO, 2TI, 3BM, 2NQ (15 watts), 2DI, CE2BX, VP6FO, PY's 2KT, 1HJ and ZB1R. S. B. Osborn of London, N.3, from W6GSL, ZD2H, ZD4AB, ZL4FT, VK5LL, 3EH and ZS5BK. N. I. Neame, 39 College Place, Brighton, 7, from PK1VY, 1GL, 1MX, VK3KX, 2VV, VE5OT and CN1AF. Roger Legge, Junr., of Binghamton, New York, from LX1AI, PZ1AA, VP7NU, 7NS, K5AH, PY8AD, VS2AE, CE3BK, EASAB, TG5, making 113 countries verified on 'phone. We suggest that Roger Legge and Bob Everard correspond!

Continuing, C. A. Betts of Birmingham has QSLs from HC1JW, 1FG, KA1ZL, LU8DR, CO2SH, 2WM, TF2Z, OA4C and HR5C. I. W. K. Smith of New Malden from ZS6S, OA4AW, and PY2CK. Leslie Morgan of Bournemouth from XE1LK, VR6AY, PY2LM, YV1AP and NY2AE.

● **Postage rates**

I. W. K. Smith forwards some useful postal information and in view of the fact that the sending of stamps with reports instead of IRCs is proving increasingly popular owing to its lower cost, we are printing these rates below, all of which are from the country of origin to the British Isles.

Postcard rates:—Argentina 110 c., Australia 1d., Bolivia 17.5 c., Brazil 500 reis, Br. Guiana 3 c., Chile 120 c., China 17.5 c., Colombia 8 c., Costa Rica 15 c., Canada 3 c., Cuba 3 c., Dominica 5 c., Ecuador 15 c., Japan 7 sen, Kenya 15 c., Mexico 15 c., Paraguay 200 c., Peru 10 c., Uruguay 8 c., Venezuela 25 c., Egypt 4 mill., U.S.A. 3 c., and letter rates:—U.S.A. 5 c., U.S.S.R. 50 kopek, Malta 1½d., Dutch E. Indies 15 c., S. Africa 1½d., and Australia 2d. If readers know of other rates not mentioned above we shall be pleased to pass them on. Those who report transmissions from U.S.A. frequently will find it pays handsomely to make a friend in that country and exchange 1½d. for 3 c. stamps.

We often refer to the CW DX to be heard on 7 and 3.5 Mc, and to give variety from listening on 14 and 28 Mc, we suggest that those who can read the code see what stations outside Europe they can receive. Martin Bourke reports W1, 2, 3, 4 and 8 on 3.5 Mc and CM2PF, PY4BA, LU3FK, K5AM, XE1NN, PY2HH, 2AP, 2GD, 4TM, 1DH and LU9AH on 7 Mc. On 14 Mc Martin has heard CP1AA, 14430, EL2A 14320, VP8AD, VQ8AI 14300, ZB2A, CR6AI, OX7GL, HH4AS 14400, YS2LR (QSL via W5FNX), VP2LC (St. Lucia), VR4BA, VP1ZA, and VK9BW (New Guinea). This shows how a knowledge of the code will bring your country total up considerably.

● **Record HAC**

We have some entries for this record business and Conrad Tilley submits a 13-minute effort which includes VK3HG, W3ZX, CT1PM, VQ4KTB, PY2LM and JZK between 20.05 and 20.18, but we feel that to be a true record we must only consider amateur stations. S. B. Osborn submits an HAC in 33 minutes on 28 Mc, the following stations being logged between 11.05 and 11.38—HI7G, PY2CK, VU2DR,

F8WK, VK2TC, and CN8MB, only HI and CN being on 'phone.

C. Tilley has now heard 99 countries on telephony and had 76 verified—we hope the total reaches 100 by next month. He says that the QRA of HK3CG is Box 290, Bogota. R. W. Iball has heard LDUC, the "Wyatt Earp" of the Ellsworth Antarctic Expedition. P. Sawyer, 100 North End, Croydon, submits a 3.5 Mc log, but as it only contains Europeans we are not publishing it and suggest he listens in the early mornings between 05.00-07.00 for North American DX. Leonard F. Crosby, 7 Fleetwood House, Darvall Square, East Hill Estate, Wandsworth, London, S.W.18, would like details of "CL7PX" but we are quite sure that this should read CO7CX on 14,050 kc. Leonard would like to correspond with another SWL of his own age, i.e., 15-16. A query comes from S. B. Osborn, who heard "OX4C" and is wondering if this is a Greenland station. This call should read OXVC and is that of a Danish salvage boat stationed at Gibraltar; operation is confined to 14 M \ddot{c} after normal commercial operating hours are over.

Mr. Osborn remarks on the large number of VE4, 5, and W7 stations heard between 1800 and 2000 GMT during the month, and asks why these should suddenly come through at this unusual hour. The reason is that the North Pole is now in darkness and as the signal at that time would be travelling through a very dark path, propagation conditions approximate to what they are in early summer mornings. It will be found that VE5, K7, K6 and many signals that have to travel near or over the North Pole will be heard during the winter just after sunset, but they will disappear as soon as complete darkness falls across the whole path. Mr. Osborn has now heard about 100 countries on 'phone and CW.

● **S. Africans on 28 Mc**

R. H. Garland, Crowndale, Hainault Road, Chigwell, Essex wonders where the S. Africans are to

DX FORECAST FOR DECEMBER 1938

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	1700-0800	0100-1800	
Western States of U.S.A.,	...	...	...	...
K7, VE4, 5 and XE ...	0000-0800	1800-2100	1500-1730	
		0600-0800		
Central America	2200-0800	1800-0800	1100-1600	
South America.				
All	2100-0800	1900-0800	0700-0900	
(Note:— S. America is frequently heard when U.S.A. signals are absent)			1100-1600	
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, 17 ...	1700-0900	0800-2000	0800-1500	
Asia.				
J, XU, MX, VSI, 2, 3, 6, 7, UO, FI, HS, etc.	1800-2100	0800-1000	0800-1030	
		1400-1700		
YI, ZC6, VU (north), U8, 9	1700-2200	0800-1000	0800-1200	
		1400-1800		
Oceania.				
VK, VK4 (Papua), VK9 ...	1900-2100	1400-1700	0900-1200	
		0700-1000		
ZL, VR2, 4, 6	1900-2000	1600-1800	1000-1130	
	0600-0800	0700-1000		
PK, KA, K6 (Guam) ...	1900-2100	0700-0900	1000-1130	
		1400-1800		

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

DX CORNER

fact every country except U.S.A. operates chiefly over this frequency range, but ZS 'phone is not so well received in Europe as in U.S.A., though quite a few can be logged on CW. Of course, ZE's come through quite well but they are further north. B. A. Willis, The Embassy Hotel, Bayswater Road, W.2, suffers severely from ignition QRM on 28 Mc, but manages to hear quite a lot on his Class B one-valver. He queries "VP9BA" but we feel sure this should read TG9BA in Guatemala City, especially as the time was 11 p.m. on 14 Mc. He also wishes to convey through the Corner his thanks to VU2EU for the card.

H. O. Crisp, Elstowe House, Pear Tree Green, Southampton, is the acting delegate for the Rueda del Oeste, and heard ZL4CF and ZS4H on 14 Mc 'phone. Unusual stations noted by K. Brunston of Broad Hinton, Wilts, include YI2BA (Eddie Behnan, Port Directorate, Basrah, Iraq), VQ8AI, G8MF (C.I.), YS2LR, CP1AA (who QSLs) on 14 Mc and PK1PK on 28 Mc. S. Burrage, 25 Grosvenor Road, Forest Gate, E.7, was quite shocked when he saw transmitters for sale in a London radio store for inputs between 100 and 250 watts, and is under the impression that to use one of these would be breaking the law! For Mr. Burrage's information there are many G's licensed to use 250 watts, and some even up to 1 kw. He mentions hearing "FN5NW" but this ought to read SM5NW; we should be interested to have further details of his reception of CR6AA in Goa.

Our old friend G. W. Barron (2DSN) of London, N.20, has now heard 103 countries, 96 being on 'phone and 34 on 28 Mc. His latest catches include K5AF (believed to be the first Panama Canal Zone 'phone), and VQ2FJ. K7FST* was also logged and can be QSL'd at Kotzebue, Alaska; he is *not* now in Wrangell I. G2NS has his pet aversions as well, and he has made full arrangements to have the following shot at dawn: (1) a local ignition specialist, (2) One Continental microphone manufacturer, and (3) two Russian commercials. We think he has made a mistake in No. 2 which should read "spitch machine deviser."

Gordon Birrell of Dundee wants to know what is usually to be heard on 28 Mc between 09.00 and 12.00; the answer is VK's, ZS's, LU's, PY's, almost all of Africa and Asia, in fact, everything but U.S.A. and Canada! We acknowledge an excellent 14 and 28 Mc log from him for which unfortunately we have not been able to find space.

● The 1.7 Mc Carriers

The most sensible suggestion so far as to probable cause of the cluster of unmodulated carriers in the centre of 1.7 Mc comes from Harry Marsden, 2DLM of Wembley Park. Harry suggests they originate from a beacon station, possibly Wick Radio. We think this is nearer the truth than our suggestion of spurious harmonics from Radio Normandie.*

Philip Shaw, Caldecote Manor, Peterborough, thinks he heard an "OY" in "OY1BE", but we think this was LY1BE in Kaunas. "VQ1DA" noted on two occasions also mystifies him, but apart from the fact that we feel that this is not the correct call

* [This cluster of beats is heard all over the country.—ED.]

we cannot supply a probable answer. S. F. M. Edwards has now obtained his AA licence—2FQX—and heard ZA1CC again, but his card was returned from Tirana marked "unknown." Roger Legge of Binghamton, New York, reports some interesting 'phones: CP1BA 14030, TG9BA 14020, ZL2BE 14210, ZL2BT 28350, ZL3BV 28300, TG9AA 28400, and K5AH 14270 kc. W. Nicholson, Caimmick House, Brisco Road, Carlisle, heard W2GIZ calling G7DV, the latter being on CW. Needless to say, this is a case of someone with a peculiar sense of humour! We are frequently asked what serial number will come after the G3's are used up. We don't know, but are prepared to guess G4!

H. Owen, 2 Campion Avenue, Bashford Park, Newcastle, Staffs, endorses the remarks made by Alan Owen that amateurs should announce their frequencies where known, especially on 1.7 Mc. He has evolved a report sheet with room for 15 separate transmissions, having columns for date, time, whom working, RST, QSB, QRM, condx, weather, and a further one for comparative reports of other stations heard in the same country. He designs his own cards by hand in green ink. He also asks what we consider constitutes DX on frequencies other than 14 Mc. We still think that anything outside Europe is DX on 28, 7 and 3.5, and all European countries on 1.7 Mc.

● Reports to Newly-Licensed Stations

C. A. Betts, 19 Wychall Lane, Birmingham, 30, rightly points out that reports to stations who have just commenced their transmitting life will be of real use and a service to them, certainly bringing back a card. Mr. Betts says that W5FKQ wants reports from Europe on his 14182 'phone and will QSL all received. Leslie Morgan of Bournemouth is very pleased with a one-valver he built for 28 Mc, as he has heard W7ACD* in Idaho, ZE1JZ and all W districts. John Brodie, 79 Parish Road, near Pontypridd, Glam., has now heard 72 countries, the latest being ZE, ZL4GM, K7FST and ZA1CC, but we don't think you ought to count the last one—at least, not until someone gets proof!! W. H. Morley, School House, Shrewsbury, Salop, has received a card from VQ4KTB marked "No. 17" and is rather mystified as to whether only 16 other cards have been sent. We think that 4KTB must have put out several hundreds, as most of our regular QSL fiends report that they have received one! C. J. Potter (BRS3035), 183 Dale Street, Chatham, Kent, had a QSL from LA1G and on it was written, "Please publish that I do not QSL SWLs."

● A Challenge

L. J. Orange, secretary of the Peckham and District Radio Club, throws an open challenge to any other SW club for a listening contest. The DX Scribe has agreed to judge the entries. Up Clubs, and at 'em!

A few reports, also suggestions for making QSL cards, are held over till next month, so if your query has not been answered, it will be in January.

Happy Christmas and a Prosperous New Year to you all from your Scribe.

The following are thanked for logs which we are unable to include in the next page. Also, most of those who do appear sent other lists: G. W. Barron, Whetstone; C. A. Betts, Birmingham; R. T. Blackmore, Exeter; E. J. Bradford, Ashby-de-la-Zouch; K. Bunston, Broad Hinton; A. H. Dyer, Torrington; J. M. Graham, Glasgow; G8VN, Rugby; L. V. Mogford, Glasgow; J. Robertson, Glenfaig; C. Ross, Fife; P. Shaw, Peterborough; J. Stewart, Dumbartonshire; J. Swynsbourne, Woldingham; P. E. Taylor, Barnet.

CALLS HEARD SECTION

GENERAL 56 Mc

SLP 1, OCT. 23, 14 Mc
0700-0830

G. F. KEEN, 2B1L, 20 St. Leonards Rd., West Hove, Sussex. HF Pen Det-ten (battery, originally Eddystone "All-World Two"). 14 Mc Windom. CW—VK2ADE, AG, HF, HN, 3FF, GP, HK, IG, OK, WL, WR, ZR, 7YL, LJ, ZL1MR, MW, 2KE, QA, ZD1AB. CX1BG. YI2BA. IEM. IEN. IEO. EA2XC. YL2AA. LY1KK. TF3X. ES5C. PA00B. OH1NW, NP, 2PS. HB9AK, CE. ON4AM, FF, MN, UL. YR5CI, CF. LA7A, IG. SPIKM, LS, YX, 2GW. F3JQ, 8SJ. D4AFF, LEU, YCF, 3CSC, GLU. SM5MP, WZ. OZ3V, 4M, 5Z, 7C. G2DW, I.K, OT, 3BI, BU, RV, 5BD, IV, MY, RV, 6AH, GH, MK, PR, 8RO, PT, IW, OM, AV, UD. CM30M, 6MO.
*Phone—LU4BC. ZB1E, L. HIMV, MT, F3JQ, UE. G2UT.

I. C. FLETCHER, 4 Cyril Road, Bexley-heath, Kent. Super Skyrider (5x16). 20-metre doublet, 24 feet high, duc W—E.
*Phone—LUI1DJ. VK3WA. CW—CX1BG. EA2XC. PY2AK. VE3ALD. VK2HF, 3BC, GP, HK, IW, NM, TB, WL, XU, 4LT. YI2BA. ZL1MR, 2FA, OU, QA, 4FV.

PHILIP MALVERN, G8DA, 10 Selkirk St., Cheltenham, Glos. 1v-1 battery with 20-metre Zepp. (66-ft. long). Magnetic elements slightly disturbed and 6 groups and 50 spots reported at Mt. Wilson Observatory, USA.
*Phone—F3JQ, 8QD. G2JM. CM5NW. I1ND, LUI1DJ. OZ5BW. SM5SI, 7YA. VK3WA.
CW—EA2XC. ES5C. G3PG, 5RV, 6GH, ZO. HB9CE. K7FST. OH2PS. PA00B. VK2AO, DG, 3CX, HK, IW, 7KV. YR5ML. ZL1LS, MK, 2FA, OU, QA, 3RU.

D. R. HILL, 81 Rye Hill Park, Peckham Rye, S.E.15. Home-made 0-v-2. 30 ft. vertical, 45 ft. at top.
CT1AY. F8SH, 8AH, G2MI. LU2EC. PY2JU, 4BI. VP6MR, 9L. VK2AHA, CI, NQ, OQ, YL, 3MM, HG, KX, MM, WA. W2IXY, 6AHP, GCT, KR, 7AMQ, BVO.

SLP 2, OCT. 23, 28 Mc
1600-1800

K. SLY, 2FAU, 16 Buckland Avenue, Slough, Bucks. Pen-v(Pen)-1(Pen). 66 ft. inverted "L."
*Phone—G5TP. 6GS. VE1DR. WIDIK, EER, GXY, IDI, IGD, IKS, IOZ, IPA, JUJ, KIJ, 2AMM, BHB, DO, DOZ, DR, FCV, IDI, ISY, KPX, KSA, 3ASZ, BBO. BDU, BOZ, CWG, EGA, GHS, GWI, HQJ, UX, 4ASE, AUU, AYP, BTV, CFJ, CPB, CYV, DRZ, DV, DXM, EEE, EGG, EGJ, EGT, EPS, EQM, EXF, FBB, FBI, FT, 5EEL, EKN, FXD, GMR, 7DPT (Port. Mass.), 8AHC, EBS, DST, FGP, GST, MCD, POP, RCX, 9CHI, CSI, DRQ, PBE, PJX, QCL, QJS, UDV, UYI, UWY, VQJ, WAL, ZNX, ZTO, ZYE, YR5CL.
CW—VE1EA, 3ARK. W4ECI, 8CKY, 9RBI.

S. L. F. EDWARDS, Hornsea, Yorks. 66 ft. inverted L. Peto-Scott D.P. Communication.
*Phone—CN8AJ, AV. H17G. TI2AC, RM. VE1CL, 3AQ, KE, ANF. WJ1NX, EER, DAY, HVS, WV, APQ, DIK, 2LHQ, BR, AUF, JCY, 3HQJ, BDV, GUF, EOZ, EGA, UX, BBO, HCS, 4PHI, DRZ, CPB, DSY, EEJ, DXW, EQB, EJQ, EXF, FT, EOZ, AUU, DV, 5EB, GRI, EEL, EGA, GMR, CXH, EKF, EJO, 6IKQ, NKF, 7DPT (port-

able, WI), SEBS, POC, DST, 9AGO, ZKL (Dak.), RRX, UQJ, RUK, GUJ, CSI, PBY, WYQ (Col.), ZYE, ZNX, DAX, XE2FC. YR5PB.

B. A. WILLIS, Park House, Tonbridge School, Kent. "Class B 1-valver." 50 ft. inverted L, pointing NNW (30 ft.) and SSE (45 ft.).
*Phone and CW—VE1CL. W1AKS, BGY, CUO, HWH, IKS, JNK, JUJ, KIK, KIJ, KOE, 2AOG, CYV, CUQ, DOZ, DR, DWN, IF, 3AFZ, CWG, EAZ, EGA, HQJ, OAZ, UX, 4DOC, DV, DXW, EGT, EXF, FRR, GRV, GV, 5CFH, 6NLS, HFF, POZ, 8MLR, PHQ, PJM, 9BAS, FGO, JCU, MLR, PHQ, PJM, PJX, PYB, TCI, UCV, USJ, USR, VQN, YMG.

R. H. GARLAND, Chigwell, Essex. 3v. battery.
CN8AJ, AV. G2MV, 6WU. W1AEP, EAY, HVS, HWU, IKS, IXP, JNX, LBB, LKM, WV, 2AOG, BLS, DR, IPI, ISY, ITN, LHO, 3CDT, EGA, EOZ, GHS, GVZ, HQJ, UX, 4CYV, DXW, EGD, EGJ, FBB, FRR, FT, DXM, 6AM, PDB, 8FGJ, POP, RIS, RTX, 9CSI, DRQ (Col.), NNO, WAL.

SLP 4, OCT. 29, 1.7 Mc
2300-2400

H. OWEN, 2 Campion Avenue, Basford Park, Newcastle, Staffs. Eddystone "All-World Two." 33 ft. ENE—WSW, 25 ft. high.
CW—G3GH, UR, 5RX, 6PA, 8NC, TR. *Phone—G5CZ, 8JM.

FROM OVERSEAS

ROGER LEGGE, 20 Beethoven Street, Binghamton, N.Y., National SW-3. 28 Mc (21.8.38—11.10.38).
*Phone—G2NM, KG, PU, ZV, VG, 5LI, BM, 6BW, DH, NF, AG, QS, 8DM, TD, MA, MU, JQ. GW5KJ. GM6RC. E16G, 9J. ZL2BT, BE, 3BV. VK2GT. ZEIJZ. ZS1AX, 6A, ED, DW. SUIRO. VP3AA. TG9AA. TI2RC, 3AV. YV1AQ, AP. LUI1DJ, 7AG, 8AB. H17G. K4FGS, ENT, 3EZR. PY3EN.
14 Mc (25.7.38—11.10.38).
*Phone—G2NO, ZO, IW, UT, DS, OV, AI, TR, LK, KG, GS, FC, 3LJ, LN, LV, HI, PS, RI, MI, DO, CP, GQ, 5LI, ML, VD, LL, ZP, DY, BT, BJ, NJ, TP, 6LV, UX, IA, KS, PY, AG, GO, GF, LW, 8AU, CO, NV, TB, GB, HN, TD, FQ, DN, IK, MF, DM, QH, SB, UR, IX, JF, QY, CI, UJ, RX, WV, MX. G18UW. GW2IP. GM2MP, 6RG, 8HP. E16F, 4L.
VK2BK, NS, HF, AFR, AGU, UC, VU, WC, YO, ZC, ADK, YL, YX, A1Z, TC, MH, VA, AHP, DA, BQ, CP, QR, WA, AGJ, DI, BZ, HX, 3EH, PB, ZX, GP, HG, SB, IG, OI, EK, BZ, PH, 4H, UL, VD, IIN, AP, JU, WU, 5BW, BF, 6HT, 7KZ.

CP1BA. CX2CO, 1AA. OA4M. CE3AT. HC1JW, JB. HK1EF, GC, 3GP, CG, LC. YV1AQ, AP, 4ABG, AX, 5ABA, ABQ, 6AM. PY1CK, FN, DW, 2ER, CK, KP, 3DU, DZ. VP1BA, 6FO, YB, MR, 7NS, NU. PK1VY, 6XX. KA1CS, FH, HS. LU4CZ, 2EC, 9BV, 5AN. K6KRG, KMB, 5AH. TG9BA, TG5. ZS1AX, 5AB. CN1AF, 8AN, MA. SUIRO. YN1OP. H19U. ZL2BE. ZB1L. HA7P. SV1KE. OZ5CN. SUIAX.

GEORGE DOWNER, 13 Colman Avenue, Homebush, N.S.W., Australia. 0-v-1. 14 Mc—Sept.
*Phone—G2NM, TR, LS, PU, AK, 3HI, 5WA, OV, 6DT, WX, 8HN, DM, AL, NJ. CW3KY. CM5NW. G15ZY. E12L.

S. B. OSBORN, 51 Eversleigh Road, Finchley, N.3. Duding last 2½ months. 0-v-1 (Pen). 80 ft. horiz. and 20 ft. vertical.
*Phone—G2MC, NHP, 5BY, CI, RD, RV, VG, 6CL, GR, OT, XM, 8IX, KZ, MG, TX.
ICW and CW—G2DN, HG, JK, MC, OD, QY, XC, ZVP, 3CU, OO, 5BY, CD, FG, MA, NF, RD, RE, RV, VT, 6FO, FU, OT, PK, VX, XM, 8IX, TX.
Harmonies—G2QY, 3GC, MS, TJ, 5NM, 6CO, ZO, 8DR, NV.

28 Mc

BOB EVERARD, "Belle Vue," Nelson Park, St. Margarets-at-Cliffe, Near Dover, Kent. 10.10.38—8.11.38. Sky Champion.
*Phone—XE1GB. PY2CK, MI. LUI1DJ, 4BC, 7AG. VK2GU, ABT, 4AP. PK1VY. VP3AA, 9L. ZS1AX, 2BT, AF, AL, J, 4H, 5T, 6EG, DYK, W, H, S. ZEIJZ, JR, JA. FA3JY, HC, 8CF. CN8AV, AB, MI, AJ. SUIGP. H17G. TI2RC, FG, 3AV. YV5AG, 1AQ. W5HDH, 6PDB, NLS, NLP, GRI, NHB, LWN, PSP, LIP, DEP, FFN, AM, PPK, MWD, AK, EOW, KR, HUM, NIO, NOG, OVQ, 7GGG, BJS, COV, 9UXI, DRQ, USI, DHO, DUU, ZNA, UEE, ZYE, WOA. VE1GD, BW, ALM, 3ANF, KE, AQ, AFI, 4IF, JJ, QO, 2CA, KX, IN, AA, BV, 1DR. G2VG, 5BM, 6LK.

14 Mc

B5WL319, Bristol, 6. "Everyman 4." NSE. 7.10.38—10.11.38.
CE1AH, AO, 3AA, AT, BK, CH, DW, CN1AF. CO2CC, HF, JJ, JV, LY, MA, RH, SV, WM, 7AB, CC, EV, VP, 8AH, BC. CX1AA, 2AK. FB8AB, AH. FT4AK, AU. F18AC, H12K, 3N, 5X, 7G. HK1CC, 3CG. K4EMG, 5AH. KA1BH, FT, 3KK, 7EF. LU1CA, 2A, DJA, DR, EC, 4A, BC, CZ, 5AN, 7PC, 8AB, AC. OH2OI. PY1BJ, FR, GR, GU, IM, 2AG, BA, CK, DU, DV, HF, IT, JC, KP, KR, MI, MK, 3AW, DZ, EN, 4CB, CT, 6AG, 7AI. SUIAX, GZ, KG, MW, RH, RO, TM, WM, 2JR, 8MA. TF3C. TG9AA, BA. TI2AV, EG, RC. VE3AF, EO, HJ, MD, MS, QI, RR, YW, 4NI, SS, WJ, 5ABD, IF. VK2AGU, VA, 3BM, BZ, HG, IG, JG, TL, WA, 5SW. VP1BA, 2AT, 3AA, 4TK, 6FO, LN, MR, TR, 7NS, 9G, L. VQ2F, HC, 4KT, VR6AY. VS7GJ, RA. VU2CA, FO, PS. W5ECT, ZS, 6NYD (Portable, Hawaii, K6), OI. XE3AR. XZ2DY. YV1AA, AP, AQ, 4AE, AN, 5AA, AD, AK, ABQ, ABY, 6AM. ZB1E, I, R. ZE1JA. ZL2BE, 4GM. ZS1AX, BL, 2AV, N, 3P, 5D.

1.7 Mc

BRIAN W. WARREN, G6CI, 19 Melville Road, Coventry. 0-v-1. 66 ft. inverted L. 18.9.38—16.10.38.
G2BI, NV, AK, RI, MK, 3PH, MC, HI, FM, KD, SB, GH, LZ, PZ, TP, DV, ZN, UJ, 5UA, UM, LO, GN, QY, HS, QK, CZ, RY, GT, 6ZQ, DP, NB, GO, LF, VD, GM, SQ, ZR, 8MW, RF, NC, GQ, SZ, FU. G18LF, VP, UF, ML, GG, DT, TR, PX, VN, LZ, SR, GI. CM6RZ, NM, PA, WY. CW2BG, JL, ZQ, OU, UJ, 5BI, BK, PR, RO, UQ, BH, RX, JU, 8Y, CC.
G5UM, Welwyn, Herts. Between Oct. 16 and 23. 1v-2.
CW—G2CF, IC, NJ, OU, 3GH, HA, IZ, MD, PD, SY, TI, UB, AO, 4GN, HS, IL, KT, LO, QK, RX, 6NB, VD, VC, WY, ZX, 8GI, IJ, IV, NC, PW, TL, VN. CW5BI. OZ7BR.
*Phone—G2PO, 3OA, SI, 5CD, MM, RD, 6FI, PA, ST, SY, UT, 8DS, JM. CM6SR. CW2BG.
Asterisk denotes QSO.

CLUB ACTIVITIES

ASHTON AND DISTRICT AMATEUR RADIO SOCIETY, Commercial Hotel, 86 Old Street; alternate Wednesdays; 6d. per meeting; K. Gooding (G3PM), 7 Broadbent Avenue.—A library has been formed and W. P. Green appointed librarian; well-known handbooks have been obtained. On October 30 a party of 15 visited Rochdale, and aided by splendid arrangements made by G3BN inspected the up-to-date equipment at the "Empire." After tea G3BN and G6QA were visited. A visit to the B.B.C. Moor-side Edge Station has been fixed for December 17. The chairman (G5PX) is arranging to give slow Morse on 1870 kc every Thursday at 11 p.m., whilst members bringing 'phones may assist learning at the regular meetings.

BOLTON Y.M.C.A. RADIO SOCIETY, 125 Deansgate; Friday evenings; Association fee, 7s. 6d.; Wireless Section, 2s. 6d.; N. D. Whitehead.—The Society holds a group transmitting licence under G8WY, having three operators. The equipment is a 10-watt transmitter: crystal oscillator, power amplifier coupled to a Zepp aerial. Contacts are mostly CW. The building of a frequency doubler is in process. The receiver is 0-v-I (mañns). During the winter session members are to give a series of lectures on "Amateur Radio."

BRADFORD RADIO SOCIETY, Cambridge House, 66 Little Horton Lane; S. Hartley, 7 Blakehill Avenue, Fagley; 2s. 6d.—Dec. 20; "Alternating Current, Theory and Practice" has been chosen as a title by Mr. Bateman for his lecture, which will be of an elementary nature.

BRIGHTON BRANCH (2FNZ) W.F.S.R.A., 2 Cheap-side, London Road; alternate Fri. 8 p.m.; Fred R. Jupp, 2FAD, 12 Brading Road.—The CO/PA transmitter of 2FAD was demonstrated on Nov. 11. An electron-coupled frequency meter/monitor constructed by 2DGR was used for checking. The following day members paid an interesting visit to the Southwick power station.

DEPTFORD MEN'S INSTITUTE S.-W. RADIO CLUB; Tuesdays, 8 p.m.; 1s. 3d. per term of about 13 weeks; G. Edwards.—Recent lectures: "Measuring Instruments," by Avo, Ltd., and "Electrical Interference," by Belling-Lee, Ltd. The Morse class continues to make progress, and an "Eddystone" SW receiver is now in use. With the acquisition of some new apparatus, the transmitter is in "a state of rebuild." Of individual interest is the acquisition by 2DKX of a "National 80x" receiver which he demonstrated to the club, both the performance and the interior workmanship proving interesting to those who have been using "straight" receivers of the home-built type.

DULWICH RADIO CLUB, 329a, Upland Road; W. J. Bird, 2BKK.—An enjoyable evening was spent at Peckham and District Short-Wave Club H.Q.; a National communication receiver was demonstrated, and members were interested in the method of coil-switching. The A.R.R.L. "Old Reliable Three" has been giving a good account of itself on the 10-metre band—on Nov. 6, using a six-foot length of copper tube, signals from all quarters of the globe were received at midday.

EASTBOURNE AND DISTRICT RADIO SOCIETY, Science Room, Cavendish Senior School; T. G. R. Dowsett,

48 Grove Road.—G. Parr of the Edison Swan Electric Co., Ltd., recently gave a lantern lecture and demonstration on "The Cathode-Ray Tube and Its Applications." He explained the many uses the tube could be put to, such as: the purity and measurement of AC waveforms, phase relationship between two waves, measurement of modulation of transmitters, aligning band pass coils, measurement of heart beats, which require an amplification of a million to get good deflection on a seven-inch tube, (measurement of the strength of muscles needs even more amplification), measurement of pressure in various kinds of apparatus, etc., etc. Mr. Parr also described time-base circuits and pointed out certain snags; television was also dealt with, and by use of the lantern, picture faults were pointed out, together with the ideal.

EDGWARE SHORT-WAVE SOCIETY, Constitutional Club, Edgware; Wednesdays; F. Bell, 118 Colin Crescent.—The meeting exciting most interest recently was when G2QY explained his 5-metre apparatus and the aerials used during tests. Half the club decided to build receivers for the Atlantic tests, and a discussion was held on November 30. Lectures by Messrs. Cossor and Dr. Stephans of T.C.C. proved of interest. All tickets have been sold for the Club's first Annual Dinner. Membership has now reached 40. 2DLV has obtained his full licence (G3VW).

ENFIELD RADIO SOCIETY; A. E. Dempsey, 50 Chase Side Avenue.—Many interesting experiments have been carried out last month on 2FBG's transmitter under supervision of G5DJ. Weekly Morse class now being held regularly with good attendance. Society anxious to co-operate with others, secretaries please note.

EXETER AND DISTRICT WIRELESS SOCIETY, 3 Dix's Field, Southernhay; Mondays, 8 p.m.; 5s., Juniors (under 17) 2s. 6d.; W. J. Ching, 9 Sivelil Place, Heavitree.—Once again a varied programme is reported including a visit to Exeter Electricity Showroom; F. Thorn has given a most interesting demonstration on some of the new season's radio sets; then V. Searle, M.Sc., of the Physics Department of the University College of the South-West spoke upon "Pioneers of Radio" and dealt mainly with the theorists and their ideas, which led to practical application; at the next meeting F. W. Saunders (G3MU) demonstrated his receiver and amplifier, then gave in detail construction of each piece of apparatus; members were able to hear the excellent quality of the equipment. An animated discussion followed as to the merits or demerits of transformer coupling and this evening was voted one of the most successful "round table" talks of the session.

GLASGOW SHORT-WAVE RADIO SOCIETY, 104 Renfrew Street; Friday, 8 p.m.; 5s.; James Neilson, 305 Crofthill Road.—Instruction on short-wave radio reception and transmission is given, including Morse; ample opportunity is available for all interested. Beginners are cordially invited.

GLOUCESTER RADIO CLUB; G. G. E. Lewis, 30 Kitchener Avenue.—On November 23 a demonstration of all-wave receivers was held. December 7 is reserved for a discussion on "Aerials and Coils, Receiving and Transmitting," and the Christmas Party will take place on the 21st. In the New Year, a "Hat-Night" will be held on January 4, when members will be required to extract a question from the hat and speak on that subject. A "Junk-

Auction" (January 18) and Club Birthday Party and Supper (February 1) are arranged.

ILFORD AND DISTRICT RADIO SOCIETY; St. Albans Church Room, Albert Road (near Town Hall); Thursday; C. E. Largen, 44 Trelawney Road, Barkingside.—At the November 3 meeting, Mr. Darvell demonstrated his 4-band, 7 valve Superhet, followed by discussion. On November 10 Mr. Menage, of Messrs. Rothermel, Ltd., gave a lecture; he dealt with the manufacture and application of piezo-electric crystals in a masterly manner. The various ways in which the crystals may be used for speakers, pick-ups, microphones, deaf-aids, etc., impressed members as a wonder of the age. The latest Ilford "Bulletin" is to hand and, besides setting forth the many facilities available to members—QRA Service, Library, Loan of Apparatus Service, Transmitter, etc., etc., there is a technical section. We dare not advertise it more, lest "S.-W.M." sales are adversely affected!

IRISH AMATEUR RADIO SOCIETY, 83 North Circular Road, Dublin; Wednesdays; D. McNeill, 12 Merrion Road, Dublin, C.2.—The Club Room is open every Monday, Wednesday and Friday at 8 p.m. A 2-valve receiver has been temporarily loaned to the Club. Morse is practised from 9.30 to 10.30 every Wednesday. A series of lectures for beginners will shortly commence.

KING'S LYNN S.-W. CLUB, Adult School, New Conduit Street; Fridays; G. Rodgers, 112a, High Street.—A lecture by W. G. Nixon (G.E.C.) was well received by members and public. The president, Mr. H. W. Young (Chief Constable), took the chair. The lecturer outlined the advance of radio, showing how interdependent this was on improvements in valve design. The progress of valve development through the years following the war was also outlined. The lecture was illustrated by a film. A. Chilvers reports G3SZ as his call and is active on 40 metres.

MAIDSTONE AMATEUR RADIO SOCIETY, The Clubroom, 244 Upper Fant Road; P. M. S. Hedgeland (2DBA), 8 Hayle Road (Maidstone 4142); alternate Tuesdays.—Dec. 13, "The Commercial Applications of the Piezo-Electric Crystal," by H. G. Menage, of R. A. Rothermel, Ltd.; Jan. 3, "Some Stepping Stones in Speaker Progress," a non-technical lecture by G. S. Taylor, of the Whiteley Electrical Radio Co., Ltd.; Jan. 10, The Second Annual General Meeting. A booklet containing full details of how to join, the objects, subscriptions, and rules of the society, will be sent to anyone interested.

NEW MALDEN RADIO SOCIETY, The Village Restaurant, Malden Road; monthly; J. D. Kingston (G3VK), 51, High Drive.—The first meeting (November 14) with an attendance of 23, including 12 full licences and 5 AA's, consisted of a discussion on the relative merits of straight and superhet receivers; G8TX, G3FU, and 2DBY demonstrated their receivers, and during the evening 8TX made a special transmission. Next meeting: December 12.

PECKHAM DISTRICT S.-W. CLUB, The Windsor Castle, Cator Street; Thursday, 8 p.m.; L. J. Orange, 11 Grenard Road.—An AA licence has been

granted (2FOZ) and work started on a transmitter. A three-stage rack is being built, the power pack has been designed by 2DJN (350 volts with various LT's), this will also be used for a receiver to be built. Arrangements have been made for an aerial array. Two more members are applying for AA's.

SOUTHPORT AMATEUR TRANSMITTERS' ASSOCIATION; R. Rogers (G6YR), 21 Chester Avenue.—All members report considerable activity. G2IN and G5ZI are making headway on 56 Mc CC. The new shack has been built and a photo is promised.

SURREY RADIO CONTACT CLUB, "The Alhambra," Wellesley Road, W. Croydon; first Tuesday, 8 p.m.; A. B. Willsher (G3IG), 14 Lytton Gardens, Wallington.—Early in November the secretary of the R.S.G.B. (J. Clarricoats) spoke to members on "Amateur Radio, its History and Growth," commencing with a description of the earliest days of Marconi and others, who were classed as the first amateurs. He then described the post- and Great War eras. After the war names such as Admiral Jackson, Sir Oliver Lodge, and Erskine Murray laid the real and lasting foundations of amateur radio, and the speaker then gave account of the recent Cairo Conference. The Annual Dinner will be held on December 6.

SUSSEX S.-W. AND TELEVISION CLUB; C. J. Rockall, "Aubretia," Seafield Road, Rustington and E. C. Cosh, "Anslyn," Mill Road, Angmering (Joint).—Dec. 6, address by the Mullard Wireless Service Co., Ltd.; Dec. 20, Standard Telephones and Cables, Ltd. Recently affiliated to R.S.G.B.

THORNTON HEATH, SHORT-WAVE RADIO AND TELEVISION SOCIETY OF, St. Paul's Hall, Norfolk Road; Tuesdays, 8.15 p.m.; R. E. Dabbs (G2RD), 4, Nutfield Road.—On November 7 E. J. Pickard (G6VA) of Webbs Radio, gave a talk and demonstration of the popular Sky Champion and its associated plug-in R meter. USW interest still proves strong and the following week two members (G2RD and G2DP) gave a joint talk. The 29th was the occasion of a talk on "Five-metre Experiences," by W. H. Allen (G2UJ), of Tunbridge Wells. Faraday House has been visited. The "straight or super-het" discussion mentioned last month showed a preponderance of support for the latter. A strong programme is fixed for December.

WILLESDEN AND DISTRICT S.-W. SOCIETY, 31 Willesden Lane; 6d. per week; G. H. Talbot, 5 Linden Avenue, Kensal Rise, N.W.10.—2ATV has constructed a 3-valve receiver for the Club and tests are being made. At the last general meeting the possibilities of publishing a club magazine, and obtaining an AA licence for the club were considered. 2ATV has now completed his Tx. Headquarters are open every evening except Thursday and Sunday from 6.30 to 10 p.m.

WORTHING AND DISTRICT S.-W. CLUB, The Literary Institute, Committee Rooms, Montague Street; 1s. 3d. quarterly; alternate Thursdays, 7.30; D. Boxall, "Braeside," Greenlands Road, Durrington.—December meetings, 8th and 22nd. Details of meetings and also of weekly Morse practice may be had from the secretary.

Read "The Short-Wave Magazine" regularly

THE TWO-BAND TWO *Continued from page 26.*

Some other ends to be gathered up are as follows: Wire the PA tank circuit so that the plate end of the coil is towards the meter, then the neutralising condenser is not in the field of an opposing voltage; use the extension control on C8—it reduces hand capacity very considerably, both sides of the condenser being "hot"; modulation can be plugged in at J4; the cathode tuned circuits are arranged to be "high-C" so do not dispute the coil values, while lighter wire is used for the ECO coil in order to flatten the resonance peak, thus improving stability; do not allow more than a half-glow to appear at the bulb B, which should be a 60 mA "red top."

The appended short tables of coil data and other information will supplement this description and show what readings are to be expected.

No-load Voltage with circuits at resonance. HT supply 460 volts.

	<i>APP4g.</i>		<i>TZO8-20</i>
<i>Sup.</i>	<i>Screen</i>	<i>Plate</i>	<i>Plate</i>
40	180	300	460 volts

Coil Data. Raymart threaded formers for L1, L2. Denco standard coils at L3.

	<i>ECO</i>	<i>Tritet</i>	<i>7 Mc</i>	<i>14 Mc</i>
L1	10 turns No. 26 tapped 2½ turns from earth end.	10 turns No. 18	—	—
L2	—	—	15 turns No. 18	7 turns No. 18

Wire is enamelled, and all windings follow threads.)

Current readings and condenser settings. Drive frequency 7185 kc.

<i>Band</i>	<i>Tritet</i>	<i>C1</i>	<i>ECO</i>	<i>C1</i>	<i>C5</i>	<i>C8</i>	<i>Total PA mA at</i>
7 Mc	—	—	—	Co29°	43°	25	4
14 Mc	32°	—	—	14°	15°	23	3
14 Mc	—	—	55°	14°	15°	21	3

PA grid current against double cut-off and 5,000 ohm leak.

CO	7 Mc	13 mA
Tritet	14 Mc	11 mA
ECO	14 Mc	12 mA

Amateur Radio in the RAF

There are naturally many members of the Royal Air Force who are holders of transmitting licences or interested in Amateur Radio.

Their organisation, which has official encouragement and support, is well-established and has an ever-growing membership. The journal of the R.A.F. Amateur Radio Transmitting Society, "QRV," is a 40-page duplicated production which, though it is not printed, contains excellent articles of considerable practical value and high technical interest.

The headquarters of the Society are at Cranwell, where the RAFARTS transmitter is installed and operated under call G8FC. The local group have exceptional facilities and are very active, and one of their objects is to maintain communication from Cranwell with member-groups at R.A.F. stations all over the world.

While membership is necessarily confined to those connected with the Service, Auxiliary and Dominion Air Force personnel are eligible, as are members of the Civilian Wireless Reserve.

Correspondence should be addressed to the Hon. Secretary, N. Davis (G6TV), R.A.F. Amateur Radio Society, Electrical and Wireless School, Royal Air Force, Cranwell, Lines.

VALVES T20, TZ20, 17/6. T40, TZ40, 24/-. 866, 10/-. 866, jnr., 7/6. RCA 955 acorn, 25/6.

IMPEX First grade American. 5Z3, 53, 59, 79, 89, 46, 83, 5/6. 6L6, 6V6, 25L6, 6A6, 6K7, 6N7, 6C5, 6/6. 80, 4/6. 50, 10, 8/6.

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All parts can be supplied separately.

35-in. Racks	£1 2 6	7-in Panels	3 0
10½-in. Panels	4 6	3½-in. Panels	1 6

Chassis and brackets, 5/6.

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Sky Champion, £15 15s.

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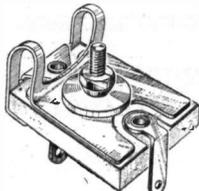
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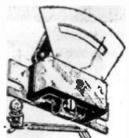


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- 2 A maximum of three lines only will be allowed, including name and address.
- 3 Trade and Box Number advertisements cannot be accepted.
- 4 We reserve the right to refuse any advertisement.
- 5 We cannot act as an intermediary for an advertiser in this section.
- 6 Advertisements must reach this office not later than the 15th of the month preceding the month of issue.

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WANTED—5 mF Tx, cheap, and 10 m Tx, also 5 m Batt. Op. RX.—G8TL, 10 Chepstow Crescent, Ilford.

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STERLING Radio Manual, 2nd ed., exchange for Xtal holder, Morse key, etc.—Cross, "Sleepy Hollow," Down Road, Portishead, Som.

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B.T.S. 4-valver, 9-96 m, cost £9 10s.; Ultra-short 3-valver, 4-8 m, cost £2, less valves, offers?—BSWL 437, 40 Station Road, Wigston Magna, Leicester.

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ARRL 1936 Handbook, 3s.; 1937 ed. 3s. 6d.; Foundations of wireless, 3s.; Wireless for the Man in the Street, 2s. 6d.—G3SS, 256 Stockfield Road, South Yardley, Birmingham.

SALF—Heayberd Transformer (500v. secondary, 4 LT's), never used, 14s. 6d.; Pathe Home Cinema and films, cost £7 10s., sell 40s.—G2YV, Trumwyn, Cannock, Staffs.

WANTED—DC Elimintaor, 150 volt, in good condition.—P. Boylan, 19 Quay Street, Skerries, Co. Dublin.

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WANTED—1936, 1937, "QST," "Radio," "T. R. Bulletin," complete, also Eddystone 1013. Exchange for components.—94 Grasmere Road, Birmingham, 21.

SALE—Eddystone All-World Two, little used and in original box, £3. Ekco AC 18 Eliminator, 9s. 6d. "Radio" 60 amp. hr. Acc., 5s.—A. Goodall, Cleadon, Sunderland.

WANTED—1 or 2 mA meters, any type, 0 to 50 or 0 to 100 scales. Must be cheap.—2F10, I. Frank, 4 West Albert Park, Liverpool, 17.

HIGH QUALITY Transf. 550-0-550, 175 mA, shrouded, 5 volt, 6.3, 7.5, CT, 22s. 6d.; Three MA Meters (50, 100, 150). 2 3/4 inch, flush, 9s. 6d. each.—G8DC, Stoneyholme, Burnley.

4 EDDYSTONE coils, 6-pin (LB, Y, R, G), base, 2 v. holders, 2 b'set and b'spread; 6 pillars (1 1/2-inch) all for £1.—Stocks, 10 Bywater Street, Leeds, 11.

Owing to space considerations we regret that a few advertisements are being held over until next month.

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.	M.	KC.	CALL-SIGN, LOCATION, SCHEDULE.
13.92	21,550	GST, Daventry.	25.42	11,800	DJZ, Zeesen, 2150-0350.
13.93	21,540	W8XK, Pittsburgh, 1100-1300.	25.42	11,800	COG1, Matanzas, 1200-0500.
13.93	21,530	GSJ, Daventry, 1045-1700.	25.42	11,800	OER3, Vienna, possibly discontinued.
13.94	21,520	W2XE, Wayne, Sa, S 1300-1800; weekdays 1230-1500.	25.42	11,800	JZJ, Tokio, 2030-2200.
13.95	21,500	W2XAD, Schenectady, 1300-1700.	25.45	11,790	W1XAL, Boston, 2145-2330.
13.97	21,470	GSII, Daventry, 1045-1350, 1400-1700.	25.47	11,780	HP5C, Panama City, 2300-0300.
13.99	21,450	DJS, Zeesen, 0505-1600.	25.47	11,780	OFE, Lahti, 0605-1705.
14.23	21,080	PSA, Rio de Janeiro, F 1750-1800; 1st Th of month 1615-1700.	25.49	11,770	DJD, Zeesen, 1535-2125, 2150-0350.
15.77	19,023	H88PJ, Bangkok, M 1300-1500.	25.51	11,760	OLR4B, Prague, see OLR4A 25.34 m.
16.23	18,480	HHB, Radio-Nations, S 1545-1630.	25.51	11,760	XETA, Monterrey, 1830-2030.
16.84	17,810	TPB3, Paris-Mondial, 1430-1600.	25.51	11,760	TGWA, Guatemala, temporarily discontinued.
16.86	17,790	GSC, Daventry, 1045-1350, 1400-0130.	25.53	11,750	GSD, Daventry, 0600-0815, 1720-2100, 2320-0130, 0220-0420.
16.87	17,780	W3XAL, Boudbrook, 1900-0400.	25.55	11,740	COCX, Havana, 1300-0600 (0500 Mondays).
16.88	17,770	PHT2, Huizen, S 1125-1430, M, T, Th and Sa 1225-1430.	25.55	11,740	SP25, Warsaw, 2300-0200.
16.89	17,760	DJE, Zeesen, 0505-1050, 1300-1500, 2150-0350; S 1610-1725.	25.57	11,730	W1XAL, Boston, Th and Sa 0100-0300 (Pan-American programme).
16.89	17,760	W2XE, Wayne, temporarily discontinued.	25.60	11,720	CJRX, Winnipeg, 2300-0500; S 1800-0300 (M).
17.33	17,310	W2XGB, Hicksville, believed to be discontinued.	25.60	11,720	CR7BH, Lourenco Marques, 1710-2100; S 1500-1900.
19.52	15,370	HAS3, Budapest, S 1400-1500.	25.61	11,718	TPA4, Paris-Mondial, 0000-0215, 0230-0500.
19.56	15,340	DJR, Zeesen, 1300-1400, 2150-0350.	25.62	11,710	YSM, San Salvador, temporarily discontinued.
19.56	15,330	W2XAD, Schenectady, 1715-2300.	25.63	11,700	SPB, Motata, 0620-0700, 1600-2115.
19.60	15,310	GSP, Daventry, 2115-0130.	25.64	11,700	HP5A, Panama City, between 1640 and 0300.
19.61	15,300	YDB, Bandoeng, 0630-0700.	25.64	11,700	CB1170, Santiago, 1600-2000, 2200-0500.
19.62	15,280	LKU, Buenos Aires, believed temporarily discontinued.	25.65	11,690	"Radio Boy Landry," Saigon, 0100-0600, 1030-1400.
19.63	15,280	DJQ, Zeesen, 0505-1600, 2150-0350.	25.66	11,685	XGJ, Hankow, 1200-1230.
19.64	15,270	W2XE, Wayne, Sa, S 1830-1930, weekdays 1800-2000.	25.70	11,676	IQY, Rome, 1837-1935, 2000-2030.
19.66	15,260	GSI, Daventry, 0220-0420, 0600-0815, 1720-2100.	26.01	11,530	SPD, Warsaw, as SPW 22 m.
19.67	15,243	W1XAL, Boston, 1730-2000 ex. Sa; S 1400-1500.	26.31	11,400	HBO, Radio-Nations, temporarily discontinued.
19.68	15,243	TPA2, Paris-Mondial, 0900-1400.	27.17	11,040	CSW2, Lisbon, evenings.
19.70	15,230	OLR5A, Prague, Sa, S at 2200, occasionally 1255-1555 and/or 2255-0155.	27.27	11,000	PfP, Bandoeng, see YDC 19.8 m.
19.71	15,220	PCJ2, Huizen, T 0630-0800; W 1430-1630.	28.30	10,600	ZIK2, Belize, S, W, F 0145-0200.
19.72	15,210	W8XK, Pittsburgh, 1300-2100.	28.48	10,535	JIB, Taihoku, around 1400.
19.74	15,200	DJB, Zeesen, 0505-1600, 2150-0345; S 1610-1725.	28.93	10,370	EAJ43, Tenerife, between 1935-0100.
19.75	15,190	OFE, Lahti, unused at present.	29.04	10,330	ORK, Ruysselde, 1830-2000.
19.75	15,190	ZBW4, Hong Kong, not used at present.	29.24	10,260	PMX, Bandoeng, as YDC 19.8 m.
19.75	15,190	TAQ, Ankara, 1630-1200.	29.35	10,220	PSH, Rio de Janeiro, M, T, W, Th and Sa, 2300-2400; T 0030-0130; F 2300-0030 (Sa).
19.76	15,180	GSO, Daventry, 0600-0815, 2115-0130; Sp. and Port. News 0130-0200.	30.12	9,980	COBC, Havana, S 1155-0500 (M), weekdays 1155-0515.
19.76	15,180	RW96, Moscow, mornings and afternoons.	30.22	9,925	JDY, Dairen, Manchuria, 1100-1300.
19.78	15,170	OZH, afternoons.	30.43	9,860	EAG, Madrid, evenings.
19.79	15,170	TGWA, Guatemala, weekdays 1745-1845; S 1745-2215.	30.51	9,833	COCM, Havana, S 1300-0200 (M); weekdays 1300-0430.
19.79	15,170	SM5SX, Stockholm, 1600-2200; S 1400-2200.	30.52	9,830	IRF, Rome, 1710-1800, 2300-0025, 0030-0200.
19.79	15,170	XEWV, Mexico, temporarily discontinued.	30.80	9,740	CSW3, Lisbon, evenings.
19.80	15,160	VUD3, Delhi, 0130-0330.	30.90	9,710	COCQ, Havana, S 1155-0530 (M); weekdays 1200-0600.
19.80	15,150	YDC, Bandoeng, weekdays 0330-0700, 0930-1530 (Sa until 1630), 2300-0030; S 0030-0700, 0930-1530.	30.93	9,700	"Radio Martinique," Fort-de-France, 1615-1745, 2300-0100.
19.82	15,140	GSP, Daventry, 1045-1350, 1400-1700, 2115-2300.	30.94	9,690	LRA1, Buenos Aires, M to Th 2300-0200; F 2100-2200 and 2300-0200 (Sa); S, M and Holidays 0000-0200.
19.83	15,130	TPB6, Paris-Mondial, 0700-1000.	30.94	9,690	TIANR11, Heredia, 0200-0300.
19.83	15,130	W1XAL, Boston, S 1400-1600.	30.95	9,690	ZHP, Singapore, 0940-1440, also Sa 0525-0640; S 0340-0640.
19.84	15,123	HVJ, Vatican City, 1530-1545.	30.95	9,685	TGWA, Guatemala, 0300-0430.
19.84	15,120	SP19, Warsaw, 2300-0200.	31.02	9,670	W3XAL, Boudbrook, 2200-0600.
19.85	15,110	DJL, Zeesen, 0505-0700, 1300-1400, 1535-2125; S 1100-1300.	31.06	9,660	LRX, Buenos Aires, 1430-0330; S until 0430.
19.89	15,050	RKI, Moscow, S 1800; 0600 onwards with RW96.	31.09	9,650	CS2WA, Lisbon, T, Th, S 2000-2300.
20.04	14,970	LZA, Sofia, 1100-1230, 1800-2015; S 0600-2230.	31.09	9,650	W2XE, Wayne, 2330-0400.
20.08	14,935	PSE, Rio de Janeiro, W 2100-2110; Th (ex. 1st of the month) 2000-2030; Sa 2000-2030; 23rd day of the month 2100-2130.	31.11	9,645	HH3W, Port-au-Prince, 1800-1900, 0000-0200 (or 0230).
20.38	14,720	RWG, Moscow, irregular.	31.12	9,640	CX48, Colonia, 2330-0500.
20.64	14,535	HBJ, Radio Nations, S 1845-1930; M 0630-0645.	31.13	9,636	LR03, Rome, until 0200.
22.00	13,635	SPW, Warsaw, 2300-0200.	31.13	9,636	JFAK, Taihoku, 0600-0730, 1300-1525; S 1300-1515.
24.52	12,230	TFJ, Reykjavik, S 1840-1930.	31.15	9,630	HJ7ABD, Bucaramanga, 1600-1800, 2300-0330.
25.00	12,000	VZSPS, Moscow, between 1100 and 0315.	31.21	9,612	HJ1ABP, Cartagena, between 1200-0330.
25.03	11,991	RR6, Vitoria, Spain, between 0900 and 2400.	31.23	9,607	HP3J, Panama City, 1700-1830, 2330-0330.
25.08	11,962	CB1180, Santiago, between 2100 and 0430.	31.23	9,606	ZRK, Klipheuvell, S 0830-0930, 1030-1200, 1400-1645; weekdays 0445-0550, 0520-1230, 1400-1645.
25.08	11,962	H12X, Trujillo, W and Sa 0100-0315.	31.25	9,600	NEYU, Mexico City, around 0100.
25.17	11,920	TI2XD, San Jose, 1600-1830, 2200-0400.	31.25	9,600	RW96, Moscow, 2300-0130 (or later).
25.21	11,900	CD1190, Valdivia, 1600-1900, 2100-0000, 0100-0400.	31.28	9,595	PCJ, Hilversum, S 1825-0225 (M); T 0000-0130, 1845-2050; W 0000-0315; Th 0000-0300.
25.22	11,887	TPA3, Paris-Mondial, 0600-0900, 1515-2200.	31.28	9,590	VUD2, Delhi, 0130-0330, 0630-0830.
25.24	11,855	TPB7, Paris-Mondial, 0230-0500.	31.28	9,590	VUD3, Delhi, 1330-1730.
25.26	11,870	W8XK, Pittsburg, 2100-0300.	31.28	9,590	VK3ME, Perth, M to S 1100-1300.
25.29	11,860	GSE, Daventry, 0600-0815.	31.28	9,590	VK2ME, Sydney, S 0600-0800, 1000-1600.
25.31	11,855	DJP, Zeesen, 0015-0350.	31.28	9,590	W3XAU, Philadelphia, 1600-2400.
25.34	11,840	OLR4A, Prague, 1835-2130, occasionally 1255-1555 and/or 2255-0155 (this session sometimes taken by OLR5A-OLR5B).	31.32	9,580	VLR, Melbourne, S 0500-1230; weekdays 0225-1330; Sa until 1400 and 2200-0330 (S).
25.36	11,830	W2XE, Wayne, Sa, S 2000-2300; weekdays, 2030-2300.	31.32	9,580	GSC, Daventry, 0220-0420.
25.38	11,820	GSN, Daventry, temporarily discontinued.	31.35	9,570	KZRM, Manila, M to F 1000-1400, 2130-2300; Sa 1000-1500, 2130-2300; S 0900-1600.
25.38	11,820	NEBR, Hermosillo, 1700-2100, 0200-0400.			
25.40	11,810	LR0, Rome, between 0910 and 1800.			

(31.36—62.50 m Stations were given last month).

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S.-W.M. 12/38.

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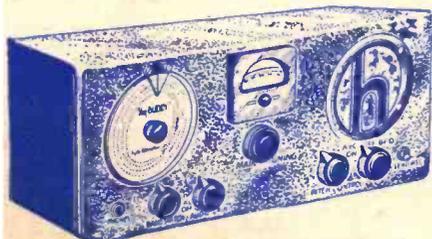
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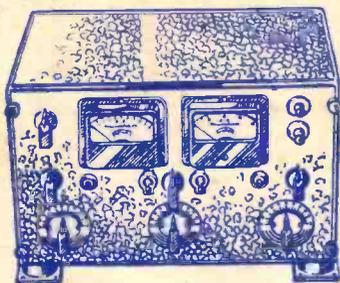
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