R.S.G.B Bulletin

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

Vol. 31 No. 5 | NOVEMBER, 1955 | Price 2/6 Monthly

SEE THE LG300 MK II FOR YOURSELF

complete with matched Power Unit / Modulator

at the R.S.G.B. AMATEUR RADIO EXHIBITION* STAND No. 7

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- 813 P.A.—150 watts with complete reliability
- 3.5, 7.0, 14, 21 and 28 Mc/s bandswitched
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- Built-in heater transformer
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- Identical styling to LG300 Mk II
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They provide the essential clarity of reception when listening to Radio and T.V.

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(4)

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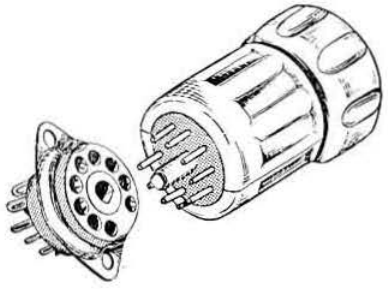
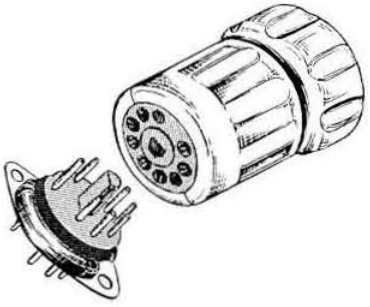
A range of miniature 9-way plugs and sockets based on the B9A (Noval) Valveholder.

Current rating ... 3 amps per contact
Voltage rating ... 500 volts between contacts



STYLE 1 Plug for use with standard B9A Valveholder. Moulded in woodflour or nylon loaded PF. With or without cover and cable clamp.



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Plug and socket for connector use. Locating spigot on plug engaging hole in socket assists blind insertion. Moulded in nylon loaded PF with or without cover and cable clamp or with saddle for chassis mounting.

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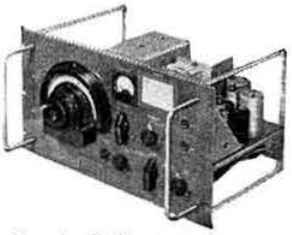
RECEIVER TYPE 1132



11 valve Superhet. Frequency coverage 100-125 Mc/s. Valve line up: R.F. Amplifier VR.65 (SP.61), Frequency changer VR.65 (SP.61), Local Oscillator VR.66 (P.61), Stabiliser VS.70 (7455), 3 x I.F. Amplifiers VR.53 (EF.39), B.F.O. VR.53 (EF.39), Detector VR.54 (EB.34), A.F. Amplifier VR.57 (EK.32), Output VR.67 (6J5). Switchable A.G.C. and A.V.C. Variable B.F.O. Circuits diagrams with units. Easily converted to cover Wrotham Band with no alterations to wiring. Conversion Slugs and instructions, 2/6 extra. Size 19" x 10" x 10" Standard Rack Mounting.

£3. 7. 6. *Packing and carriage* 15/-, 10/- *returnable on packing case.*

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This includes infra red image converter cell with a silver caesium screen which lights up (like a cathode ray tube) when the electrons released by the infra red strike it. The unit is supplied in wooden carrying case size 11×5×9in. **15/-** post paid.

BC-610 TUNING UNITS

BC-610 Tuning Units **12/6d.** post paid.

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Easily converted to 2 metres or 70 cm. In Copper-plated metal case 3½" x 4½" x 5½" with dial calibrated 0-100 and 80 V Neon Tube. Coverage approx. 190-210 Mc/s. New. **6/6** each post paid.

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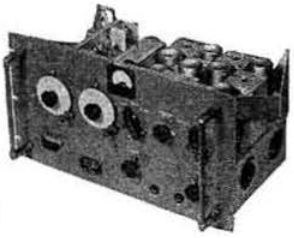
Size 2½" x 2½" x 3" **10/-** plus 1/6 p.p.

2 METRE RECEIVER TYPE R 1392

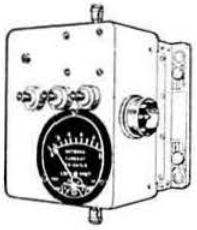
Air Tested
15 Valve Superhet

Frequency 95-150 Mc/s
(2 to 3 metres)



Valve line up: 1st and 2nd R.F. Amp VR.136 (EF.54), 1st Local Oscillator VR.65 (SP.61), 2 Oscillator Multipliers VR.136 (EF.54), 3 I.F. Amp V.R.53 (EF.39), A.G.C. 6Q7, Output 6J5, Muting VR.92 (EA.50), Noise Limiter VR.92 (EA.50), B.F.O. 6J7, Mixer VR.136 (EF.54), De Mod. 6Q7.
Slow motion Tuning over 95-150 Mc/s or can be Crystal controlled. Power supply required: 240-250 volts at 80 mA 6.3 volts at 4 amps. Size 19" x 10" x 10" Standard Rack Mounting.

£6. 19. 6. Complete with valves and circuit diagram, checked and Air Tested. *Packing and postage* 17/6, 10/- *returnable on packing case.*

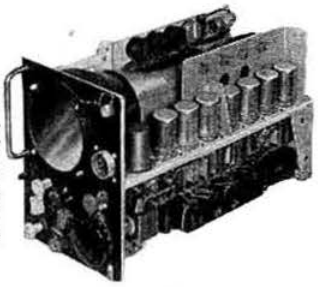


ANTENNA RELAY UNIT

U.S. manufacture, containing change-over relay, 2½in. panel mounting meter (measuring aerial current) with separate thermo-couple, vacuum condenser 50 pF. 7.5 K.V. contained in metal case 3½×4½×3½in. with ceramic stand off terminals.

8/- post paid.

TYPE 62 INDICATORS



Ideal for conversion to oscilloscopes, T.V. units, etc. Containing V.C.R.97, 12 VR.91 (EF.50), 2 VR.54 (EB.34), 3 VR.92 (EA.50), 4 CV.118. Slow-motion dial, 13 Pots and scores of useful components. Size: 8½" x 11½" x 18". New in wooden packing case.

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Plug and socket, 3 pin, waterproof, 5 amp. Suitable for caravan or trailer. **1/6 per pair** post paid.

Jones type plug and socket 6-way. **1/9 per pair** post paid.

Selenium Rectifiers 125V, 80mA Chassis cooled 1 in. x 1 in. x ¼ in. **4/3** post paid.

Microphones E.M. with switch. Boxed, new **1/6** p.p.

Alarm Bells, U.S. manufacture, 24V d.c., 3½ in. dia. Stout aluminium casting. New, boxed 6/- p.p.

Rectifier Unit, containing half wave 12V ½A selenium rectifier 1 in. dia. housed in Bakelite case, size 2½ in. x 1½ in. x 1¼ in. **1/3** p.p.

Yaxley type Switch, Base mounting 2 pole, 5-way, 4 bank, 6 in. spindle. **3/-** p.p.

Aerial Rods, 12 in. x ¼ in. sections, copper plated. **2/3 per doz.**

Cathode Ray Tube type 3BP1, with mu-metal screen and base, 3 in. short persistence tube. **22/6** p.p.

Hand Generator (ex-Dinghy Transmitter) 28V, 175A and 300V 40mA output. Containing useful reduction gearing, housed in strong aluminium casting. Can be used for hand bench grinder, basis for megger, etc. Generator can be converted to mains motor. **15/-** p.p.

Mains Motor, 220-250V a.c./d.c. Spindle ¼ in. extending 1 in., ⅞ pulley with v groove at ¼ x ⅝. Overall length 8½ in., dia. 3½ in. Base plate 4 in. square, 4 hole fixing. **15/-** p.p.

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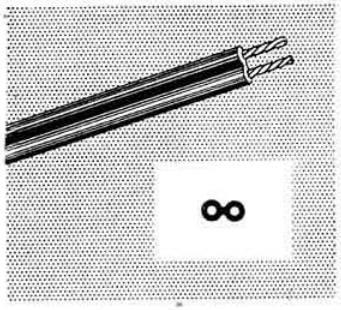
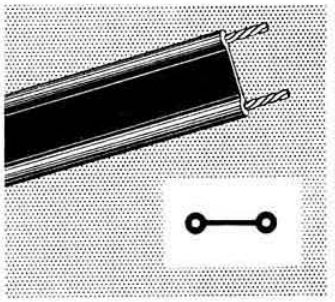
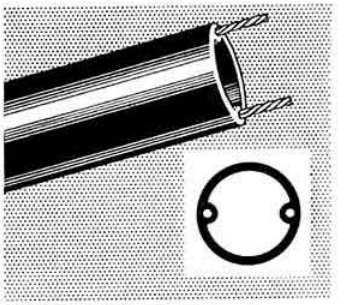


K.24.B 150-ohms nominal impedance, figure-8 section twin; capacitance 10.6 mmf/ft; Attenuation at 50 Mc/s, 2.1 db/100 ft; power rating at 100 Mc/s, 300 watts.

K.25.B 300-ohms nominal impedance, flat ribbon-type twin; capacitance 4.6 mmf/ft; Attenuation at 50 Mc/s 1.0 db/100 ft; power rating at 100 Mc/s, 500 watts.



British Pat. No. 668,206



K.35.B 300-ohms tubular twin feeder with stable characteristics in varying weather conditions. Capacitance 4.0 mmf/ft; Attenuation at 50 Mc/s, 0.92 db/100 ft; power rating at 100 Mc/s, 550 watts.

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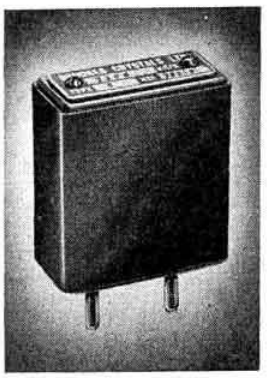
BROOKES *Crystals*



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Illustrated is a Type S Crystal unit from a range covering 100 kc/s to 15 Mc/s.

- *Black bakelite case.*
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- *Two 1/4" dia. pins spaced 1/2" centres.*

ALL Brookes Crystals are made to exacting standards and close tolerances. They are available with a variety of bases and in a wide range of frequencies. There is a Brookes Crystal to suit your purpose—let us have your enquiry now.

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G4GZ's bargains

RCA AMPLIFIERS Type M1-11220, 12 watts output. Valve line up 2 6L6, 4 6J7, 1 5U4G, 190-250V a.c. input. Supplied brand new, less valves, **£9.19.6** each.

TRIPLETT MULTI-RANGE FOUNDATION METERS, scaled for volts, mA and ohms. 2½" rectangular dial f.s.d. 400 micro-amps. Complete with engraved top plate. Brand new, only **27/6** each.

MICRO-AMMETERS 0-250, 2½" round, plug-in type, **22/6** each.

SPECIAL VALVE OFFER. TT11's and EL32's, 3 for **9/6**, 12 for **30/-**.

CRYSTALS STD. ½" spacing, frequencies between 2287 and 8885 kc/s (no Ham bands). All used but O.K. 3 for **10/6**, 7 for **21/-. Our selection of frequencies only.**

" PANL " Crackle paint. Black, brown and green, **3/6** tin.

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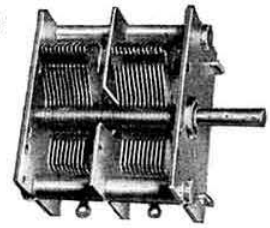

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M.E. Gang Condenser. 3 gang. 75 p.f. .. 18/3d. each (Catalogue No. 4674).
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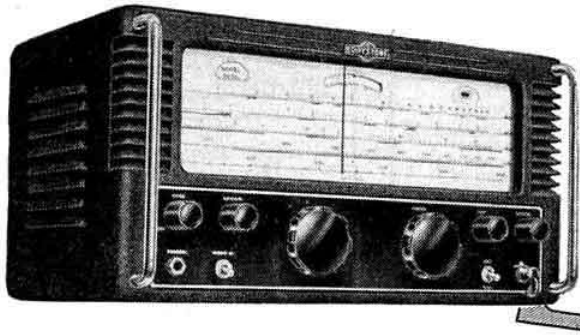

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Containing VCR97 with Mu-Metal Screen 21 valves :— 12-EF50, 4-SP61, 3-EA50, 2-EB34. Plus Pots., Switches, H.V. Cond., Resistors, Muirhead S/M Dial, Double Deck Chassis and Crystal.
BRAND NEW ORIGINAL CASES..... **67/6** Carr. **7/6.**

MUIRHEAD Slow motion drive 48-1 diameter 3 ins. **10/–**
MUIRHEAD Precision slow motion dial and drive with cursor type D132A **12/6**

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21.1 Mc/s	21.5 Mc/s	22.9 Mc/s	26.0 Mc/s
21.2 ,,	22.0 ,,	23.2 ,,	26.1 ,,
21.4 ,,	22.8 ,,	23.4 ,,	26.4 ,,

27 Mc/s

All Brand New **7/6** each

FT241A 200 Kc/s **10/-** each FT241A 465 Kc/s **10/-** each
Crystal Holders f r both Types 1/3 ea h.

U.S.A. INDICATOR UNIT Type BC929A

In black crackle cabinet 14½ in. x 9 in. x 9 in. Complete with 3BP1 C/R Tube, Shield and Holder, 2-6SN7GT; 2 6H6GT; 1 6X5GT; 1 2X2; 1 6G6, V/controls, condensers, etc. Ideal for 'scope. Brand new. **65/-.** Carriage Paid

BC966A I.F.F.

Containing 13 valves, 3-7193, 7-6SH7, 3-6H6 metal, 18 V dynamotor and fan output 450 V 60 m/A with three speed geared motor plus 4 relays, condensers and resistors. In good condition, **35/–.** Carr. **5/–**

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BRAND NEW
79/6

PYE 45 Mc/s. STRIP TYPE 3583 UNITS

Size 15 in. x 8 in. x 2 in. Complete with 45 Mc/s. Pye Strip, 12 valves, 10 EF50, EB34 and EA50, volume controls, and hosts of Resistors and Condensers. New condition. Modification data supplied.
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U.S.A. Altimeter containing 13 valves, 3-12SJ7, 4-12SH7, 1-12H6, VR150/30, 2-955, 2-9004, plus 4 relays, magnetic sounder condensers and precision resistors. Also 12 V dynamotor, output 285 V 75 m/A. Brand new original cartons **65/–**

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EVERSHED WEE-MEGGER 0-20 meg. 250 V.....	**£8**	**0**	**0**
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All in new condition and guaranteed

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Junction Box 2/6 extra

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Vibrator Trans. 12 V, 250 V, 80 mA	**8/6**
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Vibrators 6 V 7 pin synchronous...	**12/6**
Vibrators 12 V 6 or 7 pin synchro.	**12/6**
Vibrators 2 V 7 pin synchronous	**7/6**

INDICATOR UNIT TYPE 182A

Unit contains VCR517 Cathode Ray 6 in. tube, complete with Mu-metal screen, 3 EF50, 4 SP61, and 1 5U4G valves, 9 wire-wound volume controls and quantity of resistors and condensers. Offered BRAND NEW (less relay) at **67/6.** Plus **7/6** carr. "Radio-Constructor" 'scope circuit included.

EF50 (VR91A)

The selected EP50, Red Sylvania, original boxes, **10/-** each, **90/-** for ten.

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American 4-pin U.X. base, GS18, 71A and 868. Brand new. **17/6.**

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VCR97. Guaranteed full T/V picture (carr. 2/-)	**£2**	**0**	**0**
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MU-METAL SCREENS for VCR97 or 517. P.P. 1/6...		**10**	**0**
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3BP1 Brand New	**£1**	**10**	**0**

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R.S.G.B. BULLETIN

Devoted to the Science and Advancement of Amateur Radio

Vol. 31, No. 5 **November, 1955**

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ASSISTANT EDITOR: JOHN A. ROUSE, G2AHL
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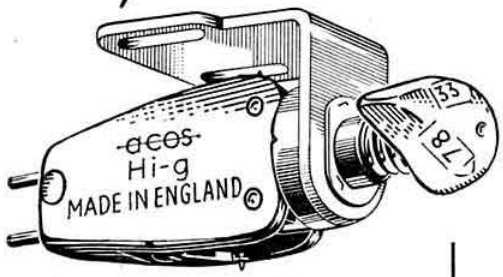

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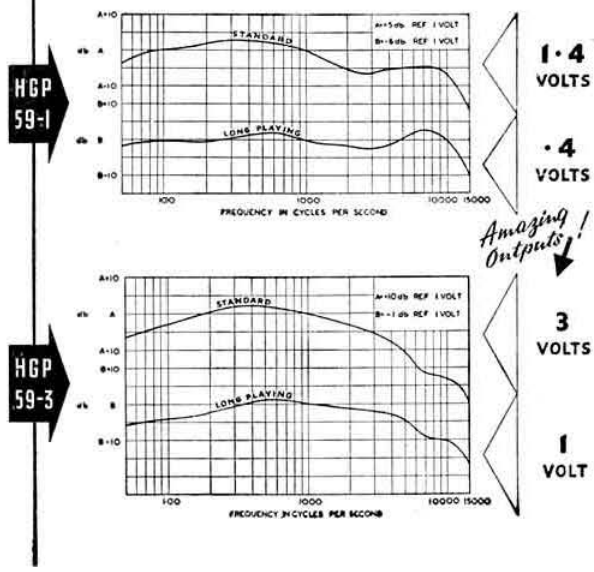

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Current Comment

The Turn of the Tide

ONE of the most important documents of our Society year occupies its accustomed several columns in the present issue. It is the Annual Report of the Council for the 12 months ended June 30, 1955, and it is accompanied by that equally important document, the Audited Accounts.

"How is the Society doing?" This, probably, will be the first question members ask themselves on reading these two documents. This year the answer is a heartening one. The tide appears to have turned, and there is a useful excess of income over expenditure. This is not to say that the tide is flowing in healthily, for this excess must be set against the deficits of previous years. The fact that an improvement *has* been shown is surely the most practical vindication there could be of the wisdom of increasing the subscription rate. On various occasions the excellent value for money for the present subscription level has been mentioned here, and it is to be hoped that what little intransigent opposition still exists to the increased subscription will die a natural death.

The tide has turned, and the thing to do now is to ensure that it shall flow increasingly in members' favour. To cut out the fancy metaphors and to get down to blunt statement, the Society must get the money in. A great deal of unavoidable expenditure lies immediately ahead. For one thing, there must be adequate representation of the British Amateur Radio Movement in international counsels. Inevitably a statement like this will evoke the occasional spiteful comment: "More trips for the boys"; but the truth of the matter is that the R.S.G.B. is looked up to for leadership and example by a great many societies overseas, and it must be represented. What is more, its close liaison with the G.P.O. ensures that at future International Amateur Radio Union conferences the weight of British opinion can be exerted with powerful influence in maintaining the world-wide Amateur Radio movement as we know it at present. Those who imagine that this sort of work can be done by the private, unorganized individual radio amateur are woefully uninformed or intentionally myopic.

Another urgent task which will find favour with all members is that of improving the BULLETIN. Already this magazine is acknowledged to be the best of its kind in Europe, but it could be made even better if more pages were added to accommodate those technical articles for which its readers clamour. As the Society's Official Organ it has an important duty to publish essential items of topical news which, while it maintains its present average size, must be at the expense of general articles. Without doubt, all members would like to see the BULLETIN made bigger, but more pages mean more pounds.

A year or so ago a suggestion was made here that every member should endeavour every twelvemonth to enroll at least one further member into the Society. This should still be the target for future years. Although, as the Annual Report discloses, something like five out of every eight transmitting amateurs are members, there are nearly three thousand who do not belong. Some hundreds of these will be inactive for one reason or another, but there are hundreds more who are sufficiently reasonably minded to agree that there are decided advantages in membership if those advantages are set out before them by fellow amateurs who are members. It cannot be denied that there is a corpus or rump of radio amateurs in this country who like to think they are "anti-R.S.G.B.", or subscribe to the conspiracy of silence that pretends there is no R.S.G.B. at all! These perhaps might well remain outside; but the other hundreds ought to come in. Both they and the Society will benefit. There is an old trade union argument which goes: "You should belong. Look at the advantages we are getting for you! It is not fair that those who do *not* belong should have them!" It is not an argument that has ever been used here, if only because it denies a man's freedom *not* to belong if he believes otherwise. Nevertheless, in a hobby organization such as ours, the non-member should be asking himself: "Can I afford not to belong?"—J. H.

Probationary Period—Morse Restrictions Lifted

JUST before this issue went to press on November 11, 1955, the G.P.O. advised the Society that the P.M.G. had decided that he will no longer require newly licensed amateurs to confine their activities to Morse working during the first year they hold a licence. This arrangement becomes effective immediately and letters will be sent in due course to the amateurs concerned amending their licences. It will no longer be necessary for amateurs to submit logbooks to the G.P.O. for inspection.

The G.P.O. emphasise that there can be no relaxation of the Morse qualifications required before an amateur licence is granted and that applicants for such licences must continue to satisfy the P.M.G. that they can send and receive signals in the Morse code at the rate of 12 w.p.m.

The P.M.G. regards this concession in the nature of an experiment and reserves the right to reimpose restrictions on the use of telephony by newly licensed amateurs if, in his view, such a course is necessary or desirable.

Members may like to know that this very important concession has been brought about as a direct result of discussions between representatives of the Post Office and the Society.—J. C.

The Britannia

Part II—The Construction of a Communications Receiver for the Amateur

By A. D. ODELL (B.R.S.20655)*

LAST month, some of the factors influencing the design of a receiver suitable for general short wave reception and, more particularly, amateur operation, were discussed. Consideration of these factors led to a basic superheterodyne circuit incorporating one r.f. and two i.f. stages and having a sensitivity of the order of 10 microvolts and a bandwidth of 5 kc/s. This month a practical circuit based on the above design is discussed together with some details of the construction.

R.F. Circuits

Fig. 3 shows the r.f. mixer, and oscillator stages. Variable bandspread of the type described in Part I is incorporated. As previously suggested a commercial coil unit is employed in order to minimise the design and constructional work. A turret-type unit was chosen in preference to the normal switch-type for two reasons. In the first place low distributed capacities are possible. This is particularly important in view of the inevitable increase in strays resulting from the inclusion of the variable-bandspread system. Secondly, elimination of a considerable amount of wiring and the generally cleaner mechanical arrangements facilitate maintenance and allow additional coil ranges to be added without difficulty. The actual turret employed is a modification of the Maxi-Q CT7 from which the normal broadcast ranges have been omitted. The resultant frequency coverage is from 1.5 to 30 M/cs and therefore includes all h.f. amateur bands. However, in view of the fact that the constructor might wish to add the medium waveband at a later stage this range was tested in the prototype. The CT7 turret is designed to operate in conjunction with a tuning capacity swing of approximately 300$\mu\mu$F, but in this receiver it was considered advisable to employ a condenser giving a slightly larger swing in view of the larger stray capacities previously referred to. To compensate for this the inductance values must be reduced, but this does not require any modification to the coils since sufficient range of inductance variation is provided by the adjustable dust cores.

One of the requirements of the r.f. stage is that it should provide sufficient amplification to raise the input noise to a level greater than the mixer noise; to maintain this gain constant over the whole of the frequency range constitutes something of a problem. It is well known that the stage gain of a pentode is approximately the product of mutual conductance and load impedance. The mutual conductance is constant, but the load impedance varies widely with changes in frequency and L/C ratio of the mixer tuned circuit. At the l.f. end of the highest frequency band the dynamic impedance of the mixer tuned circuit will be low enough to need a high slope pentode to secure the required gain. On the other hand at the h.f. end of the broadcast range the dynamic impedance may reach such a high value that instability results. For this reason a resistance of

*31 Edison Road, Welling, Kent.

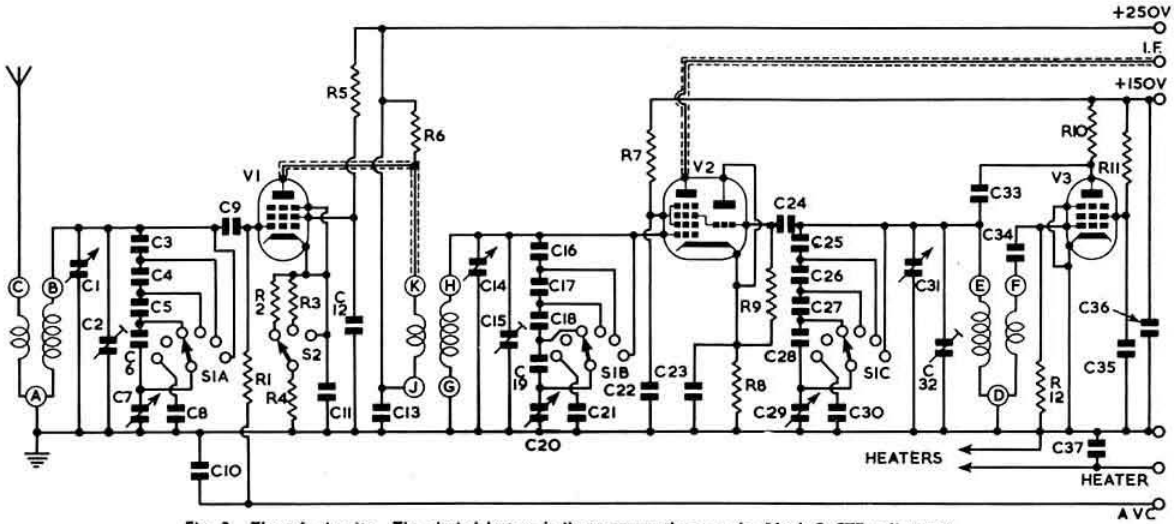


Fig. 3. The r.f. circuits. The circled letters indicate connections to the Maxi-Q CT7 coil turret.

C1, 14, 31, 3-gang tuning condenser, 380$\mu\mu$F each section, Jackson Bros. type LE4595.
C2, 15, 32, Air-spaced trimmer, 20$\mu\mu$F, Cyldon type 18/4/20.
C3, 16, 25, 100$\mu\mu$F silver mica ± 10 per cent, T.C.C. type 101 SMP.
C4, 17, 26, 68$\mu\mu$F silver mica ± 10 per cent, T.C.C. type 101 SMP.
C5, 18, 27, 39$\mu\mu$F silver mica ± 10 per cent, T.C.C. type 101 SMP.
C6, 19, 28, 27$\mu\mu$F silver mica ± 10 per cent, T.C.C. type 101 SMP.
C7, 20, 29, 3-gang bandspread condenser, 75$\mu\mu$F each section, Jackson Bros. type MG4674.
C8, 21, 30, 12$\mu\mu$F silver mica ± 10 per cent, T.C.C. type 101 SMP.
C9, 24, 100$\mu\mu$F mica, Dubilier type 635.
C10, 13, 36, 37, 0.001μF mica, Dubilier type 635.
C11, 12, 22, 23, 35, 0.01μF 350V paper non-inductive, Hunts Midget Mouldseal.
C33, 34, 50$\mu\mu$F mica, Dubilier type 635.
R1, 220,000 ohms ½ watt, Morganite.
R2, 100,000 ohms ½ watt, Morganite.
R3, 2,200 ohms ½ watt, Morganite.
R4, 120 ohms ½ watt, Morganite.
R5, 33,000 ohms 1 watt, Morganite.
R6, 1000 ohms ½ watt, Morganite.
R7, 10,000 ohms 1 watt, Morganite.
R8, 470 ohms ½ watt, Morganite.
R9, 47,000 ohms ½ watt, Morganite.
R10, 22,000 ohms 1 watt, Morganite.
R11, 100,000 ohms ½ watt, Morganite.
R12, 27,000 ohms ½ watt, Morganite.
S1, 3-bank 1-pole 6-way ceramic bandspread switch, AB Metal Products type HC.
S2, 1-pole 3-way rotary switch.
V1, 6BA6, Brimar.
V2, 12AH8. Brimar.
V3, 6AM6, Brimar.

1000 ohms (R6) is connected across the primary winding of the mixer tuned circuit. This has been found in practice to be high enough not to affect the gain when the valve is working into an unfavourable load, but at the same time low enough to limit the gain as the anode impedance rises.

The r.f. amplifier screen is returned to the 250 volt positive line through a series resistance. This gives the valve a long grid-base and reduces the control exercised by the a.v.c. If tight a.v.c. control is applied to the r.f. stage the signal-to-noise ratio of signals of intermediate strength may be adversely affected, but the above arrangement is a convenient alternative to the technically better solution of a separate a.v.c. line having a larger delay. The mixer is conventional. The local oscillator employs a high-slope r.f. pentode operating in a tuned anode circuit from a stabilized positive supply. Good performance from the local oscillator is fundamental to the overall efficiency of the receiver and the component values indicated in Fig. 3 were arrived at after a considerable amount of experiment. The reactance of the power supply leads becomes sufficient at 30 Mc/s to cause slight instability resulting in erratic operation of the oscillator. To prevent this, small mica bypass condensers are included in the r.f. unit, the bulk of the decoupling capacity being provided by 0.1μF condensers located elsewhere in the receiver.

I.F. and A.F. Circuits

These circuits are detailed in Fig. 4 where each stage is shown in a separate compartment formed by broken lines. This does not imply any necessity for complete screening; it is intended to indicate that each stage can be constructed as a unit incorporating the particular components included in its appropriate box. It is more convenient to mount the gain controls (R18 and R29) and the a.v.c. switch (S3A) on the front panel and appropriate tag points should be provided. Screening should be employed on the leads to the a.f. gain control.

The i.f. stages are conventional. The screen of the first stage is supplied from the stabilized line via a low resistance voltage divider, while the screen of the second stage is taken to the full h.t. supply line through a series resistance. This has the effect of providing a much better control on the first stage than the second, where the reduction in screen current resulting from an increase in negative bias will cause the screen voltage to rise and thus partially offset the decrease in gain. As a result the second stage is always giving some gain; this reduces distortion which might otherwise become serious on strong signals. The manual i.f. gain control does not reduce the overall receiver gain to zero, but if required this can be provided at the expense of smoothness of control by increasing the value of R18 to 10,000 ohms.

A separate double-diode is employed to provide detection and a.v.c. rectification as opposed to the normal practice in which these functions are combined with a.f. amplification. The use of a separate valve gives greater flexibility and facilitates variation in the arrangement of subsequent stages. The a.v.c. delay is accordingly derived from its own voltage divider and in the basic version of the receiver a value of 10 volts has been chosen. This gives a good a.v.c. characteristic and adequate audio output for most purposes, but if greater output is required it can be obtained by in-

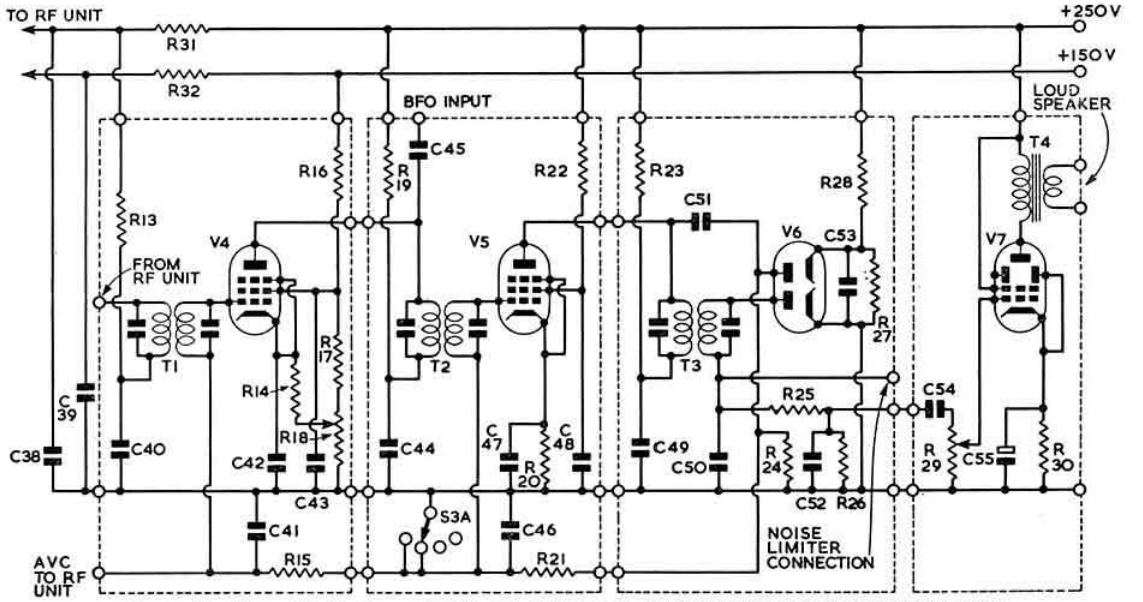


Fig. 4. The intermediate frequency, detector and output stages. The dotted lines indicate separate sub-chassis.

C38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 53. 0.1μF 350V. Hunts Mouldseal.
C45, 2$\mu\mu$F, T.C.C. type SCP.
C50, 51, 52, 100$\mu\mu$F mica, Dubilier type 635.
C54, 0.01μF 350V, Hunts Midget Mouldseal.
C55, 25μF 50V wkg., T.C.C. Micropack type CE18D.
R13, 19, 23, 2,200 ohms ½ watt, Morganite.
R14, 20, 1000 ohms ½ watt, Morganite.
R15, 4,700 ohms ½ watt, Morganite.
R16, 5,600 ohms ½ watt, Morganite.
R17, 18,000 ohms 1 watt, Morganite.
R18, 5,000 ohms wirewound potentiometer, Colvern type CLR4001/22.
R21, 1 Megohm ½ watt, Morganite.
R22, 33,000 ohms 1 watt, Morganite.
R24, 470,000 ohms ½ watt, Morganite.
R25, 26, 100,000 ohms ½ watt, Morganite.
R27, 10,000 ohms ½ watt, Morganite.
R28, 220,000 ohms ½ watt, Morganite.
R29, 1 Megohm carbon potentiometer, Erie type SKC8061A.
R30, 270 ohms 2 watts, Morganite.
R31, 32, 1000 ohms 1 watt, Morganite.
S3, 2-pole 4-way rotary switch.
T1, 2, 3, 465 kc/s i.f. transformers, Maxi-Q type IFT6A/465.
T4, Output transformer, 5000 ohms to 3 ohms, Elac type T74042.
V4, 5, 6BJ6, Brimar.
V6, 6AL5, Brimar.
V7, 6BW6, Brimar.

creasing R27 to 22,000 ohms. The values of the detector load resistances are rather different from those normally employed, and have been chosen to facilitate the addition of an automatic noise limiter requiring full d.c. detector output plus a low impedance point at half amplitude. The output stage is conventional.

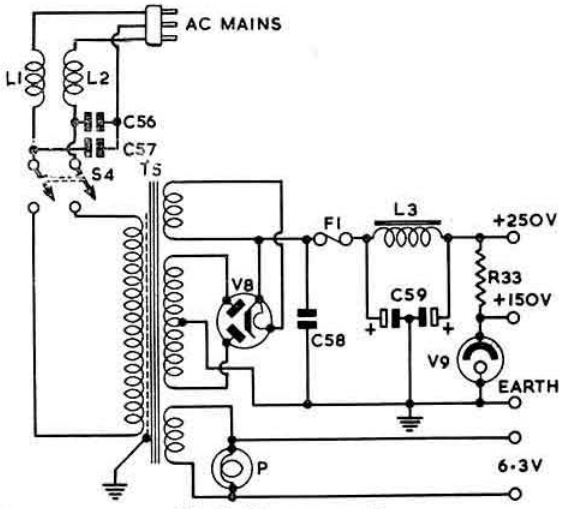


Fig. 5. The power supply.

C56, 57, 58, 0.1μF 600V wkg., Hunts Mouldseal; C59, 16 + 16μF 450V wkg., electrolytic, T.C.C. type CE35PE; F1, 150 mA fuse; L1, 2, Mains filter choke, Maxi-Q type MFU1; L3, 20H 120 mA smoothing choke, Gardners Radio type C234 Avon; P, Pilot lamp, 8V 0.3 A; R33, 3,900 ohms 6 watt, wire-wound, Welwyn; T5, 250–0–250V, 120 mA, 6.3V 5A, 5V 2.5A, Gardners Radio, type R109 Avon; S4, double pole single throw on/off toggle switch; V8, 5V4G, Brimar; V9, VR150/30, Brimar.

Power Supply and B.F.O.

The circuit of the power supply is shown in Fig. 5. The transformer specified provides rather more h.t. and l.t. current than the receiver requires, and the excess is made available for operation of a converter or v.f.o. A mains filter unit is incorporated and a 5in. Elac loudspeaker is mounted in the power supply cabinet.

The b.f.o. employs a triode-connected high-slope pentode in the well-known Clapp oscillator circuit as shown in Fig. 6. Stability is aided by the use of silver mica condensers in the tuned circuit and by employing a stabilized supply voltage. Output is taken from the grid, which is a point of fairly low impedance in this type of oscillator.

Construction

As mentioned previously in the description of the i.f. and a.f. circuits, each stage is mounted on a separate sub-chassis, wired as a unit, and then bolted in the appropriate position on the chassis framework. The sub-chassis have been deliberately chosen on the large side to facilitate construction and to cater for a variety of shapes and sizes of valves and other components. It should not be inferred from this that direct substitution of a different component or, more particularly, a different valve is permissible without the necessity for any other changes. Fig. 7a shows the general layout of the receiver and indicates the positions of the various stages. Some of the units come into the category of "extras" and will be described in a future article.

The chassis framework is built up from six pieces of metal. These are as follows: two angle brackets 12$\frac{1}{2}$in x 4$\frac{1}{2}$in with flanges on the right-angle edges; two flat trays 9 in x 3in with flanges on all sides; one strip 17in x 3in with a flange on one of the long sides; and one piece of $\frac{1}{2}$in angle 17in long. All flanges are $\frac{1}{2}$in. The overall size of the chassis is 17in by 12$\frac{1}{2}$in and the general construction can be deduced from the photograph shown in Part I. The two angle brackets are mounted in a similar position to that normally adopted for a conventional chassis, with the flanges directed inwards. The trays are mounted vertically with the short ends bolted to the front panel and with the flanges directed outwards; they are so positioned that their upper flanges are level with and parallel to the flanges on the adjacent angle brackets. The strip is mounted

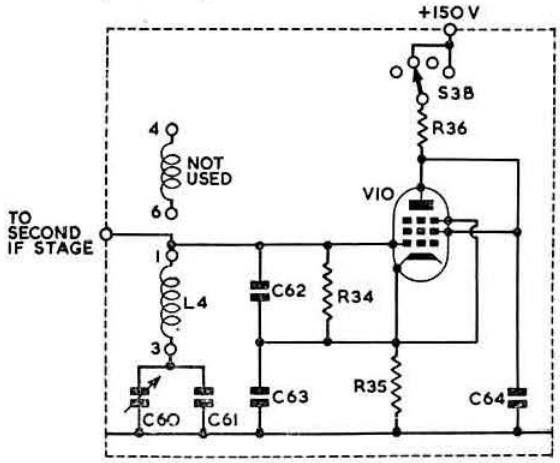


Fig. 6. The b.f.o. unit.

C60, 30$\mu\mu$F trimmer, Cyldon type 18/5/30; C61, 200$\mu\mu$F silver mica, T.C.C. type SMWN; C62, 63, 1000$\mu\mu$F silver mica, T.C.C. type SM2N; C64, 0.1μF 350V wkg., Hunts Mouldseal; L4, 465 kc/s b.f.o. coil, Maxi-Q type BF02/465; R34, 100,000 ohms $\frac{1}{4}$ watt, Morganite; R35, 10,000 ohms $\frac{1}{4}$ watt, Morganite; R36, 47,000 ohms $\frac{1}{4}$ watt, Morganite; V10, 6AM6, Brimar.

parallel to the panel with its face secured to the rear ends of the flat trays. Its flange is uppermost, is directed towards the rear, and at the extreme ends is flush with the undersides of the angle bracket flanges to which it is secured. The angle piece is secured underneath the extreme ends of the angle brackets to provide a $\frac{1}{2}$in flange directed towards the panel and level with the flange on the strip. The result is a framework giving a 2$\frac{1}{2}$in gap between flanges on three sides of the rectangle. Finally, two small brackets are mounted at the rear corners to provide support for the power socket and input terminals. The sub-chassis are of two sizes, 4$\frac{3}{8}$in x 3$\frac{3}{8}$in and 2$\frac{3}{8}$in x 3$\frac{3}{8}$in. The smaller size is used only for the noise limiter to be described later.

The r.f. circuits do not lend themselves to the same type of construction due to the large size of the major components, and so they have been combined into a single unit embracing all the components included in

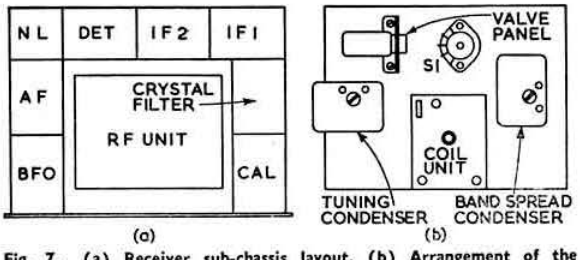


Fig. 7. (a) Receiver sub-chassis layout. (b) Arrangement of the r.f. unit seen from the rear.

Fig. 3. The coil unit, tuning and bandspread condensers and the bandspread switch are mounted between two parallel flat aluminium plates, and the valves on a small sub-panel bridged between them. Fig. 7b shows the layout when the unit is viewed from the rear, assuming that the rear plate has been removed. The coil turret is supported by means of bolts already employed for a similar purpose in its construction. The variable condensers are mounted by a pair of bolts and suitable bushings at each end utilizing convenient holes in the condenser end-plates. The bandspread switch is supported by the conventional single-hole fixing on the front plate and by extending the two threaded rods

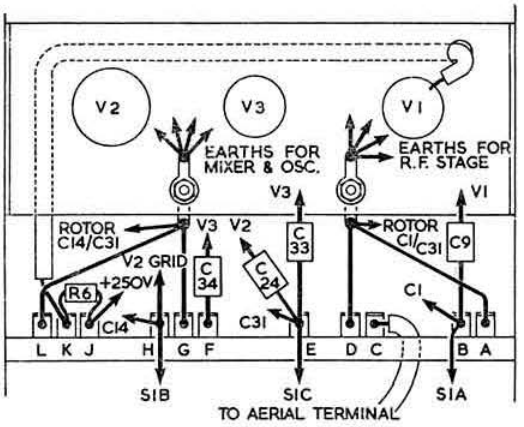


Fig. 8. Wiring of the r.f. circuits.

which support the wafers through holes in the rear plate. The overall length of the valve panel is made equal to the distance between coil turret end-plates, and fixing is by bolts in the normal way.

It will be seen that in this way a very rigid structure is built up with the minimum amount of extra metal. The unit is wired as a separate item and then mounted with the supporting plates parallel to the receiver front panel by means of four bolts. These pass through holes in flanges provided at the sides of the supporting plates and through holes in the inner sidemembers of the chassis. The turret wavechange spindle is just long enough to pass through the panel without the necessity for any extension. The variable condensers are connected to the slow motion dials by flexible couplings and the bandspread switch is connected to the appropriate control knob via a drum and cord drive. A 2⅛in. diameter drum is fitted to the control spindle and a 2¾in. drum to the switch spindle. This gives a slight mechanical advantage.

Although compact, the wiring and assembly of the unit is relatively simple if it is tackled in the following stages. First assemble the coil pack and main tuning condenser on the front plate. Next, wire up the valve panel, fit to the front plate and complete the connections to the coil pack and tuning condenser. Fig. 8 shows the connections to the coil unit and gives the relative positions of some of the small components. It will be noted that the r.f. section of the coil pack is at the front, the oscillator in the centre, and the mixer at the rear. This separation between r.f. and mixer tuned circuits minimises undesired feedback (i.e. through the tuning condenser rotor) and obviates the necessity for extensive screening. The screened lead from the anode of V1 to the primary of the mixer coil is run through a small hole in the valve panel immediately adjacent to the anode tag. Only two earth points are provided, one for the mixer-oscillator section and one for the r.f. stage. Connection is made between each earth point and the adjacent rotor tag on the tuning condenser. Finally, the bandspread switch and condenser are added and the rear plate fitted. The fixed bandspread condensers are wired directly to the switch contacts, and small metal screens interposed between wafers.

Details of the drilling of the front panel, r.f. unit mounting plates and r.f. valve sub-panel are given in Figs. 9, 10 and 11 respectively.

In general, leads should be kept as short as possible by suitable orientation of valveholders, etc. With single-ended valves it is essential to earth the small screen at the centre of the valveholder. One side of the heaters can be earthed, the chassis forming the return path for

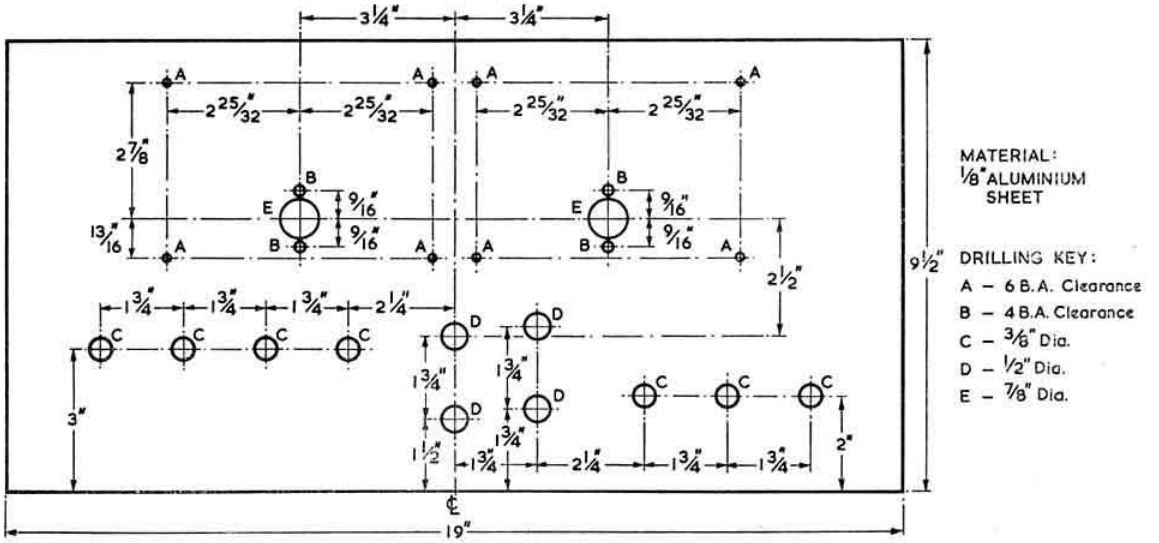


Fig. 9. Drilling plan for the front panel of the Britannia.

the heater circuit, but separate leads should run from the power socket back to the transformer winding. In order to minimize the effect of any circulating currents in the chassis framework the r.f. unit was insulated from it by perspex strips at the mounting points. However, this precaution subsequently appears to have been unnecessary.

Good quality co-axial is preferable for screened leads carrying high frequencies.

MISCELLANEOUS COMPONENTS

Valveholders	McMurdo Instruments Ltd.
Cable plugs and sockets ...	... Belling & Lee Ltd.
Fuse holder	... Belling & Lee Ltd.
Slow Motion dials	... ... Eddystone
Knobs	... ... Eddystone
Drum and cord drive ...	... ... Jackson Bros.
Cabinets and chassis	Philpott's Metalworks Ltd.

Testing and Alignment

It is advisable to follow the normal routine of working back from the detector and there are advantages in wiring and testing the a.f. and i.f. circuits before commencing construction of the r.f. section. If this plan is adopted preliminary tests of the r.f. unit can be carried out with the unit away from the receiver, appropriate temporary connections being made to the supplies. The lead from the mixer anode should be screened and its length should not exceed 2ft to avoid excessive detuning of the primary of the first i.f. transformer by the extra capacity of the screened wire. It is, in fact, most convenient to test the r.f. unit before adding the bandspread circuits and back plate, since this provides greater accessibility should it be necessary to rectify an error in wiring.

Full alignment instructions for the CT7 turret are contained in Technical Bulletin DTB2 obtainable from the manufacturers and only brief comments will be made here. The oscillator operates on the high-frequency side of the signal on all ranges. These are as follows:

Range 2	530–1600 kc/s	Range 4	4–12 Mc/s
3	1.5–4.0 Mc/s	5	10–30 Mc/s

In the absence of a calibrated signal frequency source, the r.f. and mixer circuits can be peaked for maximum gain at points about 10 per cent from each end of each tuning range. The adjustable slugs on the tuning coils

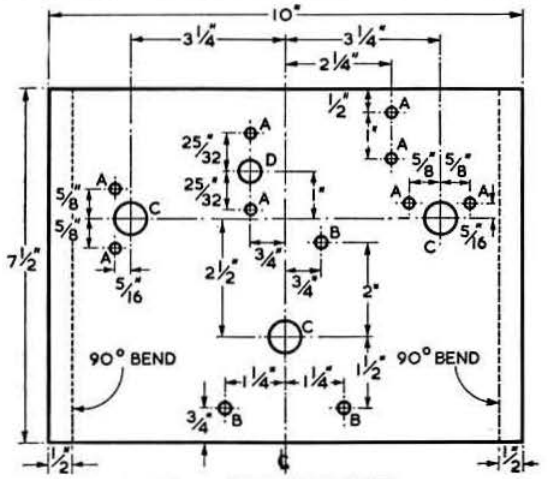
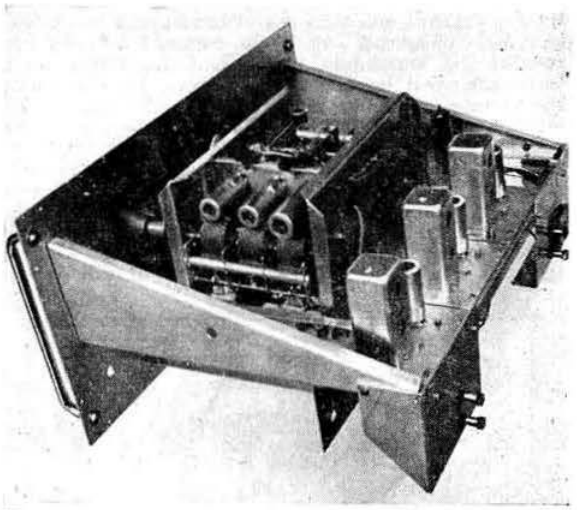


Fig. 10. Drilling details for the r.f. unit mounting plates.



Three-quarter view of the Britannia receiver showing the general layout.

take care of the low-frequency end of each waveband, but since only one set of capacity trimmers is provided a compromise setting must be found for the high-frequency ends. It is desirable to employ the minimum capacity necessary to give satisfactory tracking and in the original receiver this condition was obtained with no oscillator trimmer and with about 5$\mu\mu$F in both r.f. and mixer trimmers. At the highest frequencies the test signal will be detectable at two points, in which case the response occurring at the higher frequency setting on the receiver dial will be the true signal. The tracking is close enough to raise doubts as to the value of securing peak performance on particular bands by non-standard adjustment.

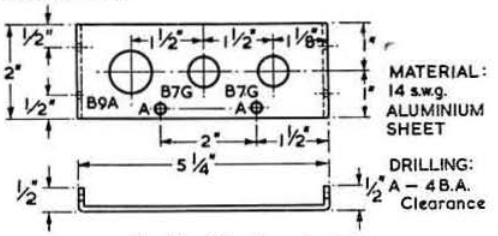


Fig. 11. R.f. valve sub-panel.

The author regrets that for unforeseen personal reasons it will not be possible to describe the various accessories and refinements for the Britannia in the December issue of the BULLETIN. However, this information will be published as soon as circumstances permit.

References

Technique of Radio Design, E. E. Zepler, Chapman and Hall.

Radio Designer's Handbook, F. Langford-Smith, Iliffe.

"Tendencies in the Design of the Communication type of Receiver," G. L. Grisdale and R. B. Armstrong, *Proc.I.E.E.*, Part III, September, 1946.

"Some Considerations in the Design of Communications Receivers," I. Forbes Simpson, *Electronic Engineering*, November, 1946.

"Communication Receiver Design," D. Heightman, R.S.G.B. BULLETIN, February, 1950.

"A Discussion of Receiver Performance," E. W. Pappenfus, *QST*, January, 1955.

A Compact Low Power Transmitter

By ALAN G. DUNN (G3PL)*

THE unit to be described may be used either as a self-contained transmitter with crystal control or in conjunction with a separate v.f.o. It was originally designed for use with the v.f.o. unit described in the January, 1951, issue of the BULLETIN, and has since been modified to permit the use of crystal control. Although no deliberate harmonic filtering has been used, no trouble has been experienced with TVI though there may be some in areas served by Channel I television stations (at the time of writing, Belfast and London). With a 250 volts h.t. supply the unit runs at 5 watts input to the p.a. stage; if the voltage is raised to 350, 10 watts input is possible.

Circuit Description

The first stage is a 6AC7 valve which acts either as a resistance-coupled buffer stage when an external v.f.o. is used or as a Pierce crystal oscillator. This drives a 6AG7 which acts either as a straight amplifier or as a frequency doubler. On 1.8 Mc/s it is always used as a straight p.a. stage and on 14 Mc/s as a doubler. The power output is about 3 watts when used as an amplifier and 1½ watts as a doubler, for an input of 5 watts. The change-over from v.f.o. to crystal control is made by taking out the coaxial input plug from the v.f.o. and plugging in the crystal.

Owing to the fact that only one tuned circuit is used in the unit the stability is excellent. Neutralizing is not required. The 6AG7 has a considerably lower grid-anode capacitance and a higher mutual conductance than commonly used types such as the 6V6, 6L6 and 807, and is very suitable for use in low power transmitter stages.

The p.a. tank circuit is arranged so that the spindle of the variable condenser is earthed, which permits mounting it directly on the metal panel. A resistor of 100 ohms acts as an r.f. choke and has been found to give more stable operation than a normal choke in this position. The tank coil should be arranged so that the end connected to C8 is the one nearest to the aerial coil; the end of the aerial coil nearest to the tank coil should be earthed. This reduces the stray capacitive coupling between the tank circuit and aerial circuit which might cause the radiation of harmonics. A closed-circuit jack is used in the p.a. cathode circuit for keying purposes while another in the anode circuit allows an external meter to be used for measuring the anode current.

Construction

Like the v.f.o. unit previously described this transmitter is built on a BC-357 marker beacon receiver chassis. All components, except the two valve-holders, should be stripped out of the BC-357 and the relay mounting plate removed by punching out the rivets holding it to the chassis. The valve-holder nearest to the panel, which is the one used for the p.a. valve, should be turned round if necessary so that the anode pin (No. 8) is adjacent to the small lead-through insulator existing in the BC-357. The anode connection is taken *via* this insulator through the deck of the chassis. The tank circuit components are mounted above the chassis and the remainder of the components and wiring below the deck.

The rear valve-holder is used for the buffer/oscillator stage. The input from the v.f.o. is taken through a Pye coaxial socket mounted on the back drop of the chassis whilst the crystal socket is mounted at the rear of the side drop of the chassis, as shown in Fig. 2. A hole 1⅛ in. in diameter is cut in the back of the metal cover to permit the Pye socket to pass through, and two $\frac{5}{8}$ in. holes are drilled in the side of the cover so that the crystal can be plugged in when the cover is in position.

The p.a. tank condenser, a small receiving type, has proved to have sufficient spacing to stand 250 volts h.t. If there is any doubt about this point a fixed condenser of 0.002 μF and of a suitable voltage rating may be connected in series with it on the anode side. This will remove the h.t. voltage from the fixed vanes. The plug-in tank coils are wound on Maxi-Q four-pin polystyrene formers of the horizontal type. Coil winding data is given at the end of the article. The coupling winding is brought out to a pair of Clix insulated sockets mounted on the front panel.

The supply voltages are taken into the unit through a length of twin screened flex which passes through a grommet in the panel below the deck of the chassis. The outer braid is used for the common h.t. negative and earthy heater connections; one of the inner conductors is used for the "live" heater lead, and the other for the h.t. positive.

Two jacks are mounted on the panel below the chassis. The jack removed from the BC-357 may be used for J1 but an insulated type is required for J2. This is mounted in the hole originally occupied by the power supply

*22 Meadowbank Road, Hull, Yorks

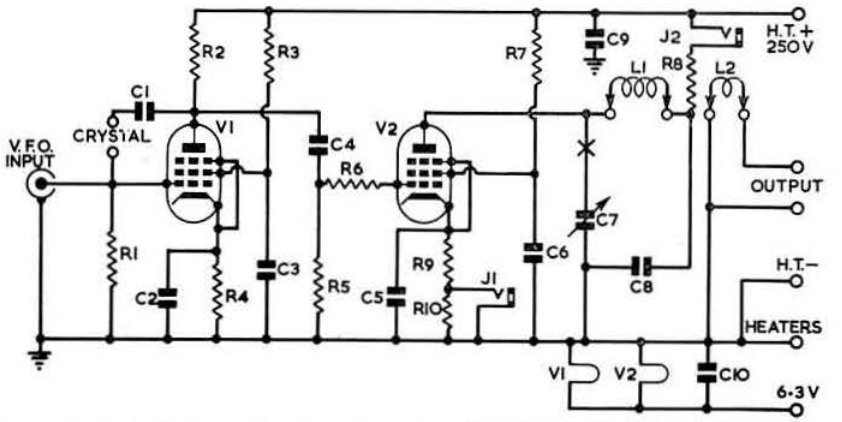


Fig. 1. Circuit of the Compact Low Power Transmitter. C1, 0.001 μF; C2, C5, C9, 0.01 μF tubular; C3, C6, C8, 0.002 μF; C4, 200 $\mu\mu$F mica; C7, 100 $\mu\mu$F mica; C10, 0.1 μF tubular. R1, R2, 4,700 ohms; R3, 22,000 ohms; R4, 180 ohms; R5, 10,000 ohms; R6, 150 ohms; R7, 6,800 ohms; R8, R9, 100 ohms 1 watt; R10, 100,000 ohms. If the h.t. voltage is raised to 350 volts, the following resistance values should be used: R2, 10,000 ohms 1 watt; R3, 47,000 ohms 1 watt; R7, 18,000 ohms 1 watt. V1, 6AC7; V2, 6AG7.

socket. A piece of aluminium 1 in. square is fastened over the hole, on the inside, by nuts and bolts through the existing four holes, and the jack, an Igranic type P72, is mounted centrally on this.

Performance

The p.a. stage can be loaded up to 20 mA anode current at 250 volts h.t., either operating straight through or doubling. The total h.t. current taken by the unit is about 40 mA.

The output coupling winding on each coil is left free to slide on the former until the correct setting for the aerial normally used is found, when it may be fixed with a dab of Durofix. It has not been found necessary to use voltage stabilization on the h.t. supply when used with the companion v.f.o. unit on 7 and 14 Mc/s, although the regulation of the power pack supplying both units is not good.

Use of Higher H.T. Voltage

If it is intended to use this transmitter with an h.t. voltage of 350, at which 10 watts input is obtained, it would be advisable to increase the values of the 6AC7 anode and screen resistors, and of the 6AG7 screen resistor, to the values given in the caption to Fig. 1. As a precaution, the series fixed condenser for blocking the h.t. voltage from the fixed vanes of the tank condenser, referred to earlier, should be inserted at the point marked "X" in Fig. 1.

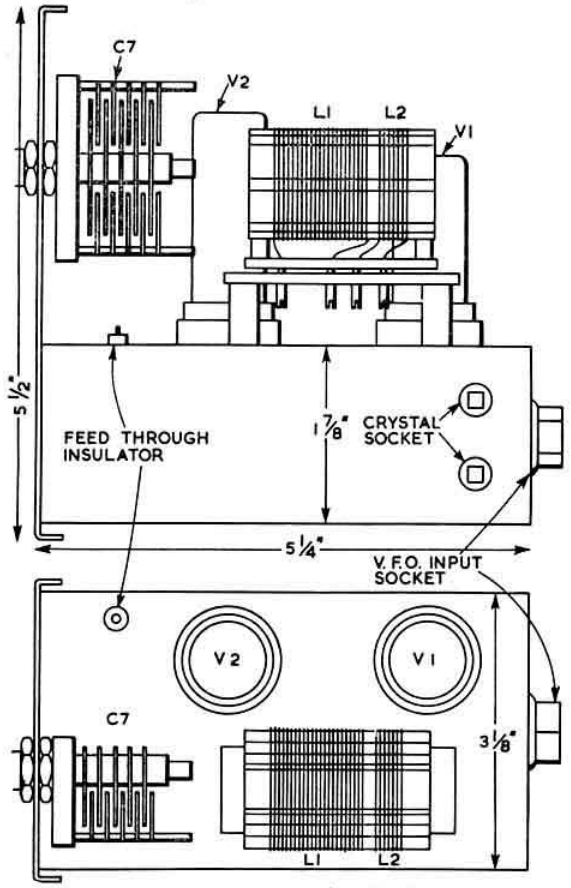


Fig. 2. Suggested Layout of Chassis. (a) Side Elevation. (b) Plan.

Coil Winding Data

The Maxi-Q formers are 1⅛ in. in diameter and the winding space available is just under 1½ in. long. If the specified wire gauges are used there should be no difficulty in getting the 1.8 and 3.5 Mc/s coil windings into the available space. In each case, the aerial coil should be about one-fifth of the number of turns specified for the tank coil.

The coil data is as follows:—

1.8 Mc/s	120 turns, 36 s.w.g. enamelled.
3.5 Mc/s	50 turns, 28 s.w.g. enamelled.
7 Mc/s	23 turns, 20 s.w.g. enamelled.
14 Mc/s	10 turns, 20 s.w.g. enamelled.

London Members' Luncheon Club

AT the meeting on October 21 the Chairman, Stanley Vanstone (G2AYC), welcomed EA8BB from Tenerife and ZB1PP who is now G3KOJ. Both visitors took the opportunity of expressing the good wishes sent by their own clubs.

The next regular meeting will be on November 18 at 12.30 p.m. at the Bedford Corner Hotel, Tottenham Court Road, W.C.1. It is hoped to arrange an additional meeting at the Royal Hotel on Friday, November 25, during the Amateur Radio Exhibition.

The New Year Party will be held at the Bedford Corner Hotel at 6.30 for 7 p.m. on February 3, 1956. Members should telephone Ruislip 2763 or HOLborn 7373 to book a seat at luncheons. There will be no meeting in January.

North West Manchester Annual Get-together

THE Fourth Annual Get-together of North West Manchester Radio Amateurs will this year take the form of a hot-pot supper and smoking concert at the Bull's Head Hotel, Walkden, on December 17. It is expected that a member of the Post Office Engineering Department will be present to give a short informal talk on the problems of TVI. Applications for tickets should be addressed to G3HNT, 37 Ranelagh Road, Pendlebury, near Manchester (telephone no. Swinton 2807), active on 3.5 Mc/s at the weekends, or to G3JNX (telephone no. Urmston 6816), active on Top Band most evenings.

Region 1 Field Day, 1955

STOCKPORT Group, with 74 points, who operated under the call-sign G3FYE/P, were the winners of the Region 1 Field Day held in September. Second were Wirral (G2AMV/P) with 70, followed by Blackpool (G5ND/P) with 67, Southport (G2ART/P) with 62 and Chester (G3KJW/P) with 53. G3ABM/P operated a one-man station at Ellesmere Port and scored 25 points.

Can You Help ?

MR. George Western (B.R.S. 20605), 118 Salisbury Avenue, Barton, Torquay, will be pleased to hear from other members who, like himself, suffer from blindness. Mr. Western is anxious to obtain the loan of a tape recorder to enable him to pursue his studies for the Radio Amateurs' Examination. Unfortunately, because of sugar diabetes which causes a lack of sensitivity in the finger tips, he is unable to read Braille.

Mr. Western would be glad to have the address of any Club that caters for the afflicted radio amateur.

Magslips in Servo Control

By T. R. BROOKE (G3CQP)*

Magslips provide a simple and accurate means of remote indication of the position of rotary beams and may also be used for the direct servo control of small u.h.f. arrays. Further information concerning their practical uses by the radio amateur will be given in a forthcoming article.

THE use of the Magslip Hunter as the controlling element in a servo system was explained in the article entitled "The Principle and Application of Magslips" which appeared in the December, 1954. BULLETIN. This system is simple to apply, and in the hydraulic servo is extremely efficient. As a purely electrical control system, however, it has one or two inherent disadvantages which make its use less desirable.

Where the Hunter is used to operate contacts supplying current to a motor, the contacts are either "made" or "broken," which means that the motor will have maximum power supplied to it the moment the contacts are made, and this will be maintained until they are broken. Maximum power on closing is a good

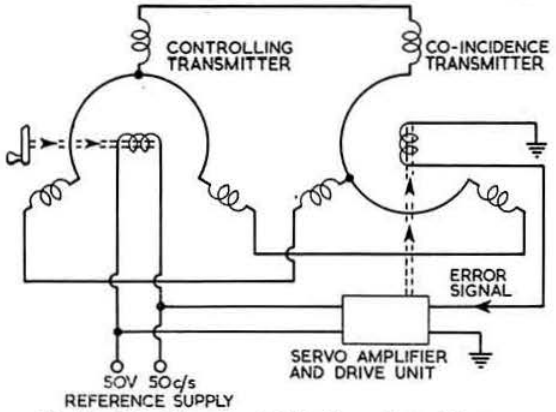


Fig. 1. Basic Schematic of Co-incidence Control System.

thing, but for the contacts to break with the motor running at full speed when nearing the line-up position, means inevitable overshoot and hunting about the zero point.

Whilst it is possible to arrange some form of relay controlled mechanical braking to operate on the output of the drive motor, this is not always a simple matter and in exposed situations is not at all desirable.

Co-incidence System

In this system the output from a two or three inch magslip transmitter is connected to the stator windings of a co-incidence transmitter as shown in Fig. 1. The co-incidence transmitter is similar in design to the normal two and three inch transmitters. In use its rotor is not connected to the reference supply, but voltages developed across the rotor windings, by induction from the stator, are used as an error signal.

With the rotor of the controlling transmitter in any position the flux axis set up by the currents in the stator winding of the co-incidence transmitter will lie in the same plane. When the rotor of the co-incidence transmitter lies at 90 degrees to the flux axis no current will be induced in the rotor winding. Any displacement from the 90 degree position will cause currents to be induced in the rotor winding, the phase of which will be governed by the direction of displacement and the magnitude by the degree of displacement. The error signal obtained in this way can be applied *via* a suitably designed amplifier to drive a motor to run the rotor round until the error signal is zero and the unit is co-incident with the distant controlling transmitter.

Two Inch Magslip Motor

This unit is easily recognised by a small disc on the end of the rotor shaft which protrudes through the terminal block. The disc carries three star-connected resistance windings. The stator has two windings independent of one another and 90 degrees apart giving a two phase two pole arrangement. The rotor has a three phase winding, star-connected, the free ends of which are joined to the free ends of the star-connected resistors on the external disc. A schematic representation is given in Fig. 2.

The threefold function of the resistance network is to increase the starting torque, to prevent the motor single phasing, and to allow speed control to be effected by variations of the applied signal voltage.

Induction Generator

These elements are used to provide negative feedback, give dynamic braking, and thus stabilise the servo. The stator has a two pole two phase winding. One winding is permanently connected to the reference supply by the terminals marked "X" and "Y," the output being taken from the other winding *via* the terminals marked "1" and "2."

The rotor comprises a copper cylinder which has a paxolin ring mounted in one end by means of which the cylinder is fixed to the spindle. When the whole is assembled the copper cylinder rotates between the stator stampings and a soft iron core which has flats machined on it diametrically opposite. With the rotor stationary the soft iron core is so adjusted that the flux linkage between the two stator windings is at a minimum value.

The reference winding produces a flux that cuts the copper cylinder thus producing rotor currents which in

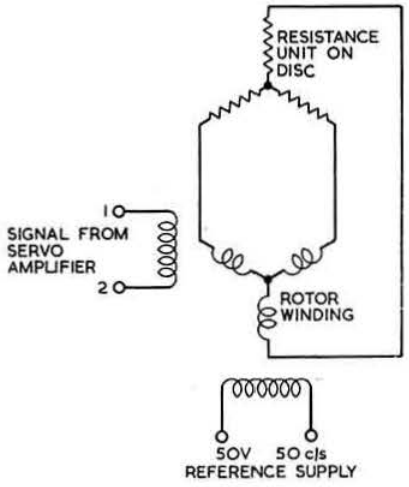


Fig. 2. Magslip Induction Motor.

*35 Hill Road, Donnington, Salop.

their turn produce a flux in opposition to that produced by the reference winding.

Whilst the rotor remains stationary the flux linkage between the two stator windings—quoting the ideal case—will be zero. However, in practice this is seldom attained and some small value of flux linkage is established, in consequence of which a small standing output voltage is almost invariably present. For most practical purposes this can be considered as zero.

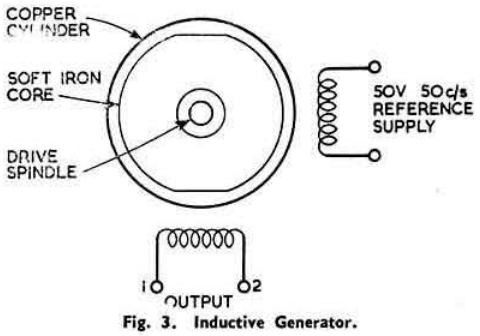


Fig. 3. Inductive Generator.

When the rotor is turned there is a flux linkage between the windings, the density of which becomes greater as the speed of rotation is increased. This being so it follows that the voltage output of the generator will be directly proportional to rotor speed, and its frequency will be that of the reference supply. The phase of the output voltage will depend on the direction of rotation of the rotor. The theoretical diagram of the induction generator is shown in Fig. 3.

Co-incidence Servo System

The co-incidence transmitter is mounted in the driven unit and its rotor is turned by the servo system. In Fig. 4 the co-incidence transmitter is shown connected to the servo motor *via* the servo amplifier. Connected also to the input of the amplifier is the inductive generator and the dotted lines with arrows represent the mechanical drive between the elements originating from the servo motor.

The values of the resistors R1 and R2 with relation to one another determine the proportion of feedback to be used. This is normally determined experimentally so that the servo will come to rest after one overshoot.

With the system lined up the servo will be quiescent. Should the distant controlling transmitter be moved the flux axis in the co-incident transmitter will be moved and a voltage will be developed across the rotor winding. The voltage will be proportional to the angle of displacement, and its phase will be determined by the direction of the displacement.

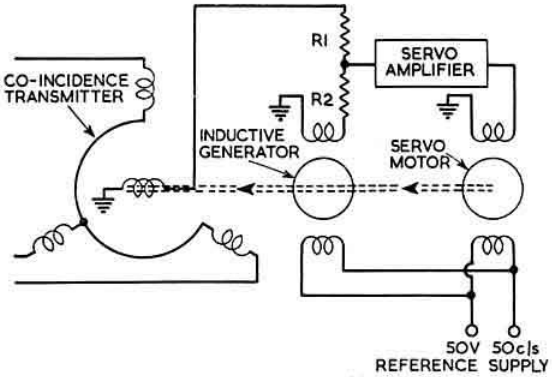


Fig. 4. Co-incidence Control System with Negative Feedback.

The voltage is fed to the servo amplifier *via* R1 causing a corresponding signal to appear at the control winding of the motor. The phase of the signal at the control winding is 90 degrees displaced from that of the input signal to the amplifier which is of course the same phase as the reference voltage. This phase shift is necessary to drive the two-phase motor and the servo amplifier must be so designed that it gives as nearly as possible a 90 degree shift when loaded by the motor.

As soon as the motor starts to drive, the signal from the inductive generator tends to back off the error signal from the co-incidence transmitter. As the "line-up" position is reached the error signal falls in value and the inertia of the system tends to keep the servo running. The output of the inductive generator is maintained by this continued movement, and as the signal from it is in anti-phase to that of the error signal, the instant the error signal falls below the value of the output of the inductive generator, dynamic braking is applied and the servo comes to rest. The phase of the reference voltage is so determined that the rotor of the co-incidence transmitter will always be driven in such a direction that the error signal is reduced. In this way the servo will always run to cancel any error signal and in doing so will become co-incident with the positioning of the rotor of the controlling transmitter.

With the rotor of the co-incident transmitter 180 degrees from the normal "line-up" position the output from the rotor will be zero. The servo will, however, be unstable, as the slightest movement will cause an output voltage to develop, the phase of which will cause the servo to drive away from this position and run round to the normal. Being an a.c. system there is sufficient movement caused by vibration to take care of this situation, and even should the servo be set 180 degrees out by hand it will not remain there.

New Radar Observer School

THE Department of Navigation of Cardiff College of Technology and Commerce has opened a new Radar Observer School which looks out over what was probably the birthplace of maritime radio. Prominent on the radar screen are Lavernock Point and Brean Down, with the island of Flat Holme between them where Marconi made his first successful transmissions across water in May, 1897.

Can You Help?

● P. W. Martin (B.R.S.20505), 49 Eton Hall, Chalk Farm, London, N.W.3, who requires the wiring diagram for the ex-Army receiver type R.208?

LONDON MEETINGS

The following programme of meetings at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, has been arranged.

December 16, 1955: **Annual General Meeting and Presentation of Trophies.**

January 27, 1956: **Presidential Address by R. H. Hammans (G2IG).**

February 24, 1956: **420 Mc/s Evening arranged by members of the London U.H.F. Group.**

March 23, 1956: **"COLOUR TELEVISION" by P. Carnt, B.Sc.(Eng.), A.M.I.E.E. (Research Laboratories, The General Electric Company Ltd.).**

Switched Two-station Tuners for the Small Hi-fi Amplifier

By A. H. KOSTER, Dr. Ing. (G3ECA)*

MANY requests have been received for a simple two-station tuner to work in conjunction with the small Hi-fi Amplifier described in the August, 1954, issue of the BULLETIN. The germanium detector circuit shown in Fig. 1 utilizing a Teletron HAX coil, has been found satisfactory for areas with a reasonable signal strength from B.B.C. stations. The aerial should be of such a length that sufficient signal voltage is obtainable from any one station without break-through from the other. If the two stations cannot be separated this is a clear indication that the aerial is too long. In the London area a 20 ft length of wire under the carpet is ample.

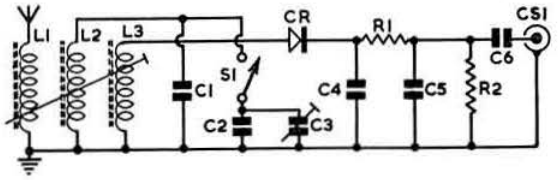


Fig. 1. Switched tuner unit employing a germanium diode. C1, 4, 100$\mu\mu$F; C2, 50$\mu\mu$F; C3, 10–100$\mu\mu$F trimmer; C5, 200$\mu\mu$F; C6, 0.01μF; CR, germanium diode (Brimar type GD3 or G.E.C. type GEX34); CS1, co-axial socket; L1, 2, 3, Teletron coil type HAX; R1, 20,000 ohms ½ watt; R2, 380,000 ohms ½ watt; S1, single pole toggle switch. The aluminium or plastic chassis should be approximately 3 in. x 3½ in. x 2 in.

To tune up, open the switch S1 and adjust the iron dust core of the coil for maximum signal from the Light Programme on 1,214 kc/s. Then close S1 and adjust C3 for the London Home Service on 908 kc/s. The values given for C1, C2 and C3 will be satisfactory for the Welsh and Scottish Regional Services as well. For the Midland and West C2 should be left out, but it is doubtful whether these stations can be separated from the Light Programme. For the North C2 should be increased to 100 $\mu\mu$F and for the Third on 647 kc/s to 150 $\mu\mu$F.

For those who wish to make alternative combinations the total capacity values required to tune to the various B.B.C. stations are given in Table I. The values given are applicable if the iron dust core of the HAX coil is adjusted to tune the Light Programme with a value of 100 $\mu\mu$F.

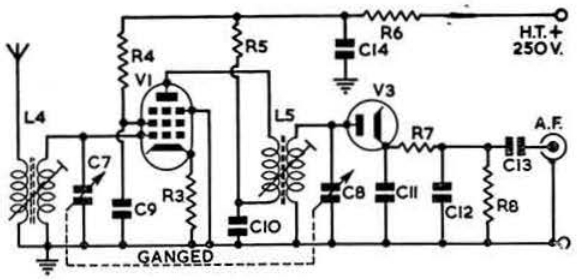


Fig. 2. Tuner unit with thermionic diode detector. The component values are given in the caption to Fig. 3.

*195 Woodford Avenue, Ilford, Essex.

It must, however, be pointed out that germanium diode circuits are usually not quite free from distortion. If the input voltage is small, distortion can be appreciable. With increasing voltage it reaches a minimum around 2 volts and then becomes worse again. This effect arises from the fact that the back resistance decreases with increasing voltage. Thermionic detectors become better as the input voltage increases. The

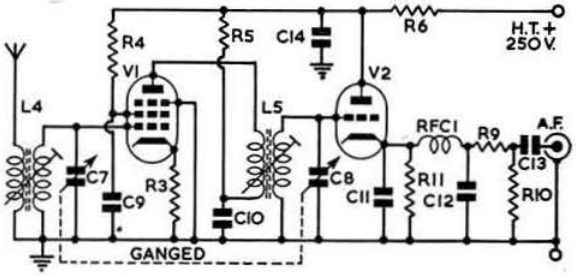


Fig. 3. Tuner unit with infinite impedance detector. C7, 8, 0.0005$\mu\mu$F twin gang variable; C9, 10, 13, 0.01μF; C11, 12, 300$\mu\mu$F; C14, 8μF 300 V; L4, Weymouth screened coil type KA2; L5, Weymouth screened coil type KH2; R3, 82 ohms ½ watt; R4, 7, 10, 11, 47,000 ohms ½ watt; R5, 1000 ohms, ½ watt; R6, 2200 ohms ½ watt; R8, 4700 ohms ½ watt; R9, 0.5 Megohm ½ watt; RFC1, medium wave r.f. choke; V1, Brimar 6BJ6; V2, Brimar 6C4; V3, ½ Brimar 6AL5.

difficulty can be avoided by using an r.f. stage to boost the voltage and by following it with a vacuum detector or an infinite impedance detector. There is not much to choose between them but that the latter is more selective, which may be useful. Circuits are shown in Figs. 2 and 3. No further explanation is needed except that in view of the small value of R3 a cathode by-pass condenser is not necessary.

Table I

Station	Frequency (kc/s)	Capacity ($\mu\mu$F)
Third	1,546	62
West	1,457	70
Light	1,214	100
Northern Ireland ...	1,151	111
Midland	1,088	125
West	1,052	133
Home	908	180
Welsh	881	190
Scottish	809	226
North	692	310
Third	647	354

Singapore QSL Cards

THE R.A.F. Amateur Radio Society has received about 1,000 cards dating back to 1945 for the following stations: VS1DO, VS1EA, VS1EB, VS1EE, VS1EG, VS1EO, VS1EV, VS1EX, VS1FC, VS1FD, VS1FF, VS1FN, VS1FR, VS1GA and VS1YL.

Members wishing to claim cards should send a large stamped addressed envelope to the Communications Manager, R.A.F.A.R.S., Royal Air Force, Locking, Somerset.

LONDON U.H.F. GROUP

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

at 7.30 p.m., December 1, 1955.

All u.h.f. enthusiasts welcome.

Annual Report of the Council

THE Report which follows covers the major activities of the Society during the year ended June 30, 1955.

Membership

Membership again showed a rather heavy drop due, no doubt, to the decision reached in November, 1953, to increase subscription rates. As at June 30, 1955, the total membership was 8,159 made up as follows:—

Country Corporate Members	5,144
London Corporate Members	1,784
Overseas Corporate Members	812
Associates	264
Life Members	144
Honorary Members	11
	8,159

In accordance with a suggestion made at the Annual General Meeting held in December, 1954, an analysis has been made of the membership records to ascertain the number of members who are licensed to operate an Amateur Radio station.

The analysis reveals that 62 per cent of the membership are licensed amateurs, 35 per cent hold B.R.S. or B.E.R.S. numbers and 3 per cent are Associates.

Details are as follows:—

Country Corporate Members, Licensed	3,280
London Corporate Members, Licensed	1,113
Overseas Corporate Members, Licensed	653
	5,046
Country Corporate Members, B.R.S. ...	1,942
London Corporate Members, B.R.S. ...	726
Overseas Corporate Members, B.E.R.S. or F.R.S.	181
	7,895
Associates	264
	8,159

During the year the Council elected 650 Corporate Members and 112 Associates and granted Corporate Membership to 263 Associates who had applied for transfer.

As at June 30, 1954, the total membership was 9,735 comprising 7,902 Home Corporate Members, 819 Overseas Corporate Members, 142 Life Members, 11 Honorary Members and 861 Associates.

The greatest losses occurred, as was to be expected, in the Country Corporate and Associate grades, the net losses in each of the four grades being as follows:—

Country Corporate Members	844
London Corporate Members	140
Overseas Corporate Members	7
Associates	497
	1,578
Increase in Life Members	2
Net Loss	1,576

The figure of 1,576 includes 626 members who failed to amend their Banker's Order or to remit the balance due for their subscription. Reluctantly, the Council had to give instructions to remove their names from the active list. An analysis of the status of the 626 members concerned follows:—

Country Corporate Members	416
London Corporate Members	110
Overseas Corporate Members	48
Associates	52
	626

The Council is hopeful that during the current financial year the membership curve will begin to show an upward trend.

The R.S.G.B. Bulletin

Volume 30 of the Society's Journal was the largest since before the war with an aggregate of 600 pages compared with 584 pages in Volume 29. The technical standard was again well maintained, with contributions covering a wide range of subjects.

The Norman Keith Adams Prize for the most original article published in Volume 30 was awarded to Messrs. Newton, Stone, Worrall and Parker, joint authors of "Propagation on 144 and 420 Mc/s." Mr. Frank Hicks-Arnold was awarded the Bevan Swift Memorial Prize for his description of "The Antennamatch"—judged to be the most meritorious article published in Volume 30.

Mr. Lorin Knight contributed an important article entitled "An Introduction to Transistors" and this was followed by a series of five articles entitled "An Introduction to Amateur Transmitting."

"The Month on the Air" was conducted by Mr. Stan Herbert while Mr. Douglas Kay contributed a new monthly feature entitled "Frequency Predictions for the Amateur Bands."

Mr. W. H. Allen, M.B.E., conducted the V.H.F.-U.H.F. feature from July to November, 1954, after which date it was taken over by Mr. F. G. Lambeth. Increased interest in v.h.f. and u.h.f. work was reflected in the number of reports received by Messrs. Allen and Lambeth. Other regular features were contributed by Mr. M. Barlow (Amateur Television) and Mr. H. F. Knott (Single Sideband). The Assistant Editor (Mr. J. A. Rouse) conducted the "Mobile Column."

The Council takes this opportunity of thanking contributors and advertisers for their support.

Post Office Matters

The effect of the more liberal transmitting licence was felt during the year; in particular licensees appreciated the facility which allows them to operate portable from anywhere in the United Kingdom without the necessity of first obtaining permission.

The decision of the Post Office to issue a Mobile Licence was warmly welcomed, more than 200 members taking advantage of the facilities offered.

The Council maintained close liaison with the Post Office through the medium of its General Secretary and the G.P.O. Liaison Committee. Discussions took place on a wide range of subjects, including the vexed question of "intruders" in exclusive amateur bands. An easing of world tension should offer the best solution to this problem.

The new arrangements in respect to Television Interference came into force in September, 1954. The Council is glad to report that there have been very few occasions during the year when difficulties have been reported in connection with TVI due to amateur transmissions. There have, however, been a few cases of

"TVI in Reverse" (due to unsuitable receiver design) all of which have been carefully considered by the G.P.O.

The number of licences in force as at June 30, 1955, was 7,384 compared with 7,624 as at the same date in 1954 and 7,718 a year earlier.

Matters connected with the Radio Amateurs' Examination, the Morse Test and Service Exemptions have all been discussed with the G.P.O. during the year, as has the suggestion that the Society should be permitted to operate a News Bulletin Service. Such a Service is now in operation.

Radio Amateurs' Examination

During the year both the Post Office and the City and Guilds of London Institute set papers for the Radio Amateurs' Examination. The number of candidates was slightly higher than in 1954 but the percentage of passes was maintained at about 80 per cent.

The Society was again represented on the City and Guilds of London Institute Moderating and Advisory Committees by Mr. W. A. Scarr, M.A., and the General Secretary, Mr. H. A. M. Clark, B.Sc. (Eng.), also served on the Advisory Committee.

Slow Morse Transmissions

Slow Morse practice transmissions were radiated daily under the supervision of Mr. C. H. L. Edwards. All members who assisted in the operation of this valuable service are most warmly thanked.

National Convention

More than 400 members and their ladies attended the National Convention in Bristol during September, 1954. The event was splendidly organized by the Bristol R.S.G.B. Group who deservedly received the thanks of all present on that memorable occasion.

The Council were glad to welcome at the Convention Dinner a distinguished gathering of prominent local citizens led by the then Lord Mayor of Bristol (Alderman G. G. Adams, J.P.) and the then Deputy Lord Mayor (Alderman K. Brown, J.P.). Other distinguished visitors represented overseas societies, the Radio Industry and professional bodies.

During Convention the General Secretary invested the then President (Mr. Arthur O. Milne) with a Chain of Office which had been most generously donated to the Society by Mr. Wilfred J. Butler (G5LJ) of Sutton Coldfield.

An excellent film record of Convention activities was produced by representatives of the Bristol Amateur Cinematograph Society.

The Council places on record its thanks to the Bristol Group, led by Mr. Roy Poeton (G3CTN) and Mr. Don Davies (G3RQ), for their great efforts. Messrs. Poeton and Davies were jointly awarded the Founder's Cup for 1954 in recognition of their outstanding work in connection with the Convention.

National Radio Show, Earls Court

In August, 1954—for the first time since 1938—the Society was represented at a National Radio Show, thanks to the kind co-operation and assistance of the Radio Industry Council and in particular to the encouragement given by the Director of the R.I.C. (Vice-Admiral J. W. S. Dorling, C.B.). The Society's stand attracted a great deal of attention and quickly became a meeting place for members visiting the Show.

The Council records its thanks to Vice-Admiral Dorling and the Radio Industry Council for providing facilities for the Society to show at Earls Court.

Amateur Radio Exhibition

About 3,000 persons attended the Eighth Annual R.S.G.B. Amateur Radio Exhibition held at the Royal Hotel, London, W.C.1, during the last week in November, 1954.

The Exhibition was opened by Mr. H. Faulkner, C.M.G., in the presence of a distinguished gathering representing many radio interests. The Exhibition was supported by the Radio Industry, the Book Trade, and the Services. The high standard of workmanship shown by those who contributed items of home-constructed equipment aroused much favourable comment.

The Exhibition was organized by Mr. Phil Thorogood (G4KD).

London Film and Lecture Meetings

During the period from October, 1954, to March, 1955, film and lecture meetings were held at the Institution of Electrical Engineers. A list of speakers and subjects follows:—

October 22, 1954. Mr. B. R. Bettridge, A.M.Brit.I.R.E., "Transistors and Crystal Valves in Radio."

November 19, 1954. Wing Commander W. E. Dunn, O.B.E., G2LR, Technical Films.

January 28, 1955. Mr. F. Hicks-Arnold, G6MB, "Antenna Matching with The Antennamatch."

February 25, 1955. Dr. R. C. Jennison, B.Sc., "Radio Astronomy and the Radio Amateur."

March 25, 1955. Mr. M. Child, "The Historical Development of Wireless Communication."

Headquarters' Station

After very careful consideration the Council decided, with regret, in December, 1954, to dismantle and dispose of the Headquarters' station. The Council had anticipated originally that it would be possible to operate the station from New Ruskin House, but it soon became apparent that the premises were quite unsuited to the type of operation which had been visualised.

Science Museum Project

The Council is pleased to report that steps are being taken to establish at the Science Museum, South Kensington, an Amateur Radio station which should fulfil many of the purposes for which a Society station is required. The Science Museum station will not be in the control of the Society but members of the Technical Committee are co-operating closely with Museum officials in the development of the project which will embrace long distance and local communication on the normal DX bands and v.h.f. communication on 144 Mc/s and possibly higher frequencies.

Technical Committee

Once again the Council records its thanks to the Technical Committee whose members have given most valued advice to the Editorial staff. Individual members of the Committee have made important contributions to the Society's Journal, examples of their work being featured on the Society's stand at the Amateur Radio Exhibition.

The Chairman (Mr. H. A. M. Clark, B.Sc. (Eng.), M.I.E.E.) and Vice-Chairman (Mr. R. H. Hammans) attended meetings at the Post Office when technical matters were under discussion and gave advice to the G.P.O. Liaison Committee on several occasions.

Contests Committee

The Contests Committee again organized a wide range of Contests. National Field Day held under very good weather conditions attracted the support of more than

100 Society groups. The event was won by the Gravesend Group with Coventry runners-up.

The 18th B.E.R.U. Contest was won by Mr. G. J. Dent (VQ4AQ) (Senior event) and Mr. J. C. van Wyk (ZS6R) (Junior event). Support for this Contest was a little greater than in recent years.

The Affiliated Societies' Contest was won by Stourbridge and District Amateur Radio Society for the second year running. D/F enthusiasts were catered for through the medium of qualifying D/F Contests. The National Final was won by Mr. T. C. Reynolds (B.T.H., Rugby).

Interest in Top Band and 2 metre work was reflected in an expanded number of entries for the two Top Band and various Two Metre Contests.

The Council records its thanks to the Contests Committee, led with unflagging energy and enthusiasm by Mr. W. H. Matthews (G2CD), with Mr. S. E. Fryer (G3ERO) as Honorary Secretary.

Radio Amateur Emergency Network Committee

The organization of the Radio Amateur Emergency Network was again undertaken by a special Committee under the Chairmanship of Mr. W. J. Ridley (G2AJF) with Mr. C. L. Fenton (G3ABB) as Honorary Secretary.

Fortunately no emergency arose during the year calling for the operation of the Network, but many groups carried out comprehensive exercises which aroused considerable interest locally. The Council records its thanks to the Committee and to those members who have joined the Network.

Exhibition (Home Constructors' Section) Committee

The Committee, drawn chiefly from the London Region, arranged attractive displays at the National Radio Show at Earls Court and at the Royal Hotel, and richly deserved the thanks which were accorded by the membership and which the Council now formally acknowledges with appreciation. The Chairman of the Committee was Mr. C. H. L. Edwards, A.M.I.E.E. (G8TL).

QSL Bureau

The R.S.G.B. QSL Bureau was again operated by Mr. Arthur O. Milne (G2MI) who had the assistance of a number of sub-managers, all of whom gave their time and services voluntarily. The volume of cards was considerably lower than in the peak period just after the war but with an improvement in DX conditions it is anticipated that the work of the Bureau will increase considerably within the next few months. The Council records its thanks to all who have assisted Mr. Milne in the operation of the R.S.G.B. QSL Bureau.

Film Library

Mr. L. S. Gilham is thanked for continuing his voluntary services as Honorary Film Curator. Mr. Gilham has been responsible for despatching and testing-out all Society films and for repairing them when damage has occurred.

Recorded Lectures

As an experiment, certain lectures delivered to meetings of the East London R.S.G.B. Group were recorded on tapes kindly donated to the Society by E.M.I., Ltd. Mr. E. Fish (G2HCZ) has been responsible for distributing and maintaining the recorded lectures and is thanked by the Council for his much appreciated services.

Meetings, Exhibitions and Dinners

Official Regional Meetings were held in York (Region 2) and Edinburgh (Region 13) and County Meetings in Dorchester (Dorset) and Lichfield (Staffordshire). The Council was represented at these meetings and also at a number of local functions including Exhibitions at Hastings, Southampton and Walton-on-Thames; Dinners at Hampton Court (Thames Valley Society), Sutton (Sutton & Cheam Society), Birmingham (Slade and Midland Societies), Kensington (City and Guilds Society) and Hamfests at Chatham (Medway Society) and Welwyn (R.S.G.B. Group).

London Members' Luncheon Club

Meetings of the Club were held monthly at the Bedford Corner Hotel under the Chairmanship of Mr. S. E. Vanstone (G2AYC). Although not an official R.S.G.B. organization the Club has continued to provide a means for visitors from abroad to meet London amateurs.

S.S.B. Convention

On the last day of the Amateur Radio Exhibition a highly successful Convention of amateurs interested in Single Sideband transmission was held in London. Amateurs from several European countries were in attendance.

U.H.F.-V.H.F. Convention

The winter activities of the London U.H.F. Group (which meets on the first Thursday in each month at the Bedford Corner Hotel) culminated in a U.H.F.-V.H.F. Convention, held on May 14, 1955. The event, organized by Mr. P. A. Thorogood (G4KD) and other members of the London Group was supported by more than 100 members.

New Publications

The Sixth Edition of *A Guide to Amateur Radio* was published in time for it to be placed on sale at the National Radio Show, Earls Court, 1954. The Winter Edition (1954) of the *R.S.G.B. Amateur Radio Call Book* was published just before the opening of the 1954 Amateur Radio Exhibition. Sales of both publications were satisfactory.

The Council records its thanks to those who assisted the Editorial staff in the preparation of the Guide, and in particular to Mr. J. P. Hawker (G3VA), and to Mr. and Mrs. John Tyndall (G2QI) who produced the *Call Book*.

International Matters

Whilst President, Mr. Arthur Milne (G2MI) accepted an invitation, extended to him by the Yugoslav National Amateur Radio Society, to attend a Convention in Ljubljiana. Mr. Milne's expenses (except for the outward journey) were paid by the host society.

Mr. Milne, in his capacity as Honorary Secretary, Region I Division, I.A.R.U., has maintained close contact with the Societies in Region I and with the members of the International Committee. Plans are now being made to hold a Region I Conference in Italy next year to discuss matters of mutual interest and concern to the Societies in that Region.

R.S.G.B. Headquarters have kept in touch with I.A.R.U. Headquarters and with Member Societies and have exchanged views on a variety of matters.

General Secretary Honoured

In December, 1954, the General Secretary, having completed 25 years' service to the Society as Secretary, was the recipient of an illuminated address, a brief case and cheque. Shortly afterwards the General Secretary's name appeared in the New Year Honours List, Her Majesty The Queen having appointed him an Officer of the Most Excellent Order of the British Empire. In May, 1955, Mr. Clarricoats, who has served on the

Southgate Borough Council since 1945, was elected Mayor of that Borough.

Miss Gadsden, who also completed 25 years' service to the Society as Assistant Secretary in December, 1954, received a cheque in appreciation of her services.

Council Attendances

The following is a list of Council attendances for the period covered by this Report:—

Name	Possible Attendances	Actual Attendances
Auchterlonie, I. D. (c)	6	2
Bartlett, H. A.	12	11
Cooper, L.	12	10
Edwards, C. H. L.	12	11
Findlay, D. A.	12	7
Gee, A. C. (a)	9	7
Hammans, R. H.	12	10
Hicks-Arnold, F.	12	11
Hum, J. H.	12	11
Milne, A. O.	12	12
Newnham, L. E. (b)	6	5
O'Brien, N. F. (c)	6	5
Varney, R. L.	12	9
Allen, W. H. (d)	6	5
Lane, R. G. (d)	6	5
Metcalfe, W. R. (d)	6	6
Mitchell, H. W. (d)	6	4
Matthews, W. H. (d)	6	6
Scarr, W. A. (d)	6	5

(a) resigned April, 1955. (b) retired December 31, 1954, appointed to fill casual vacancy May 20, 1955. (c) retired December 31, 1954. (d) elected January 1, 1955.

Headquarters

The staff at Headquarters have once again rendered loyal service to the Society and our sincere thanks are due to them all for the way in which their duties have been carried out. It is not realized by the membership as a whole how small the accommodation is at Headquarters and how much work (with the existing staff) has to be completed outside normal office hours. The Council and myself can only reiterate our deep appreciation of their unceasing loyalty and devotion to duty.

H. A. BARTLETT (PRESIDENT).
For and on behalf of the Council.

G6JJ/A operated an amateur station on 144 Mc/s at the Arts and Crafts Exhibition at the R.A.F. Station, Kenley, Surrey, on September 28, 1955.
(Photo by courtesy of NAAFI Review)

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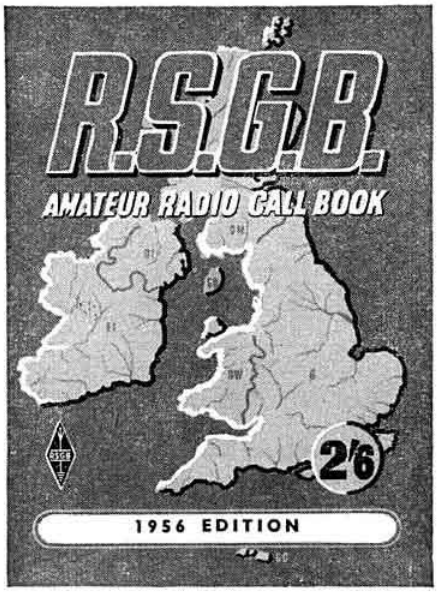

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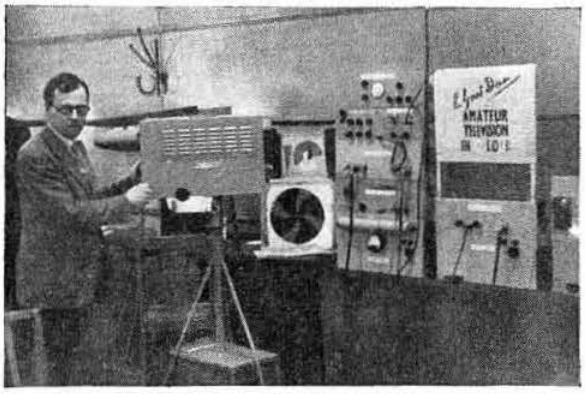
Amateur Television

By M. BARLOW (G3CVO/T)*

OVER 70 people attended the second Amateur Television Convention on October 1, 1955, at the Bedford Corner Hotel, London. The highlight of the show was the amateur colour television demonstration by Grant Dixon, of Ross-on-Wye. The camera uses the field sequential system, in which camera and receiver have motor-driven rotating colour discs. Although the system is non-compatible, running 150 lines 100 fields per second, giving 33⅓ complete colour pictures per second, the equipment is fairly simple to construct, and the results are excellent. To rest the camera and the lights—which are very powerful!—a colour bar generator was also displayed. This gives vertical bars of white, yellow, magenta, red, cyan, green, blue and black which can also be graded from full saturation to black along each bar in six steps of "contrast."



Grant Dixon with his home-made colour television camera at the B.A.T.C. Second Amateur Television Convention in London on October 1, 1955. From left to right, camera, caption holder with spare colour wheel below, camera control rack, mixer and bar generator rack. The colour monitor is at the extreme right.

G2DUS/T (Baldock) gave a very fine monochrome demonstration with his small staticon camera, test card C monoscope and bar generator. The whole unit consists of three TU6B boxes and a television set, and will be shown in operation at the Amateur Radio Exhibition, at which Mr. Cox's flying spot scanner will also be exhibited. This is one of the cheapest and simplest items of Amateur Television gear, yet is capable of giving some very satisfactory results. Romford Amateur Television group under G3AKJ demonstrated their camera which, in spite of its having just been brought out of storage gave some convincing results. B. Partridge (Bishop's Stortford) who is now G3KOK/T, showed his vision rack containing such essential items as a regulated power supply, synchronising pulse generator, and Band I distribution unit.

Birmingham Meeting

The inaugural meeting to co-ordinate activity in Birmingham was supported by 22 enthusiasts, including several well-known 70 cm experts. Plans are afoot to transmit, initially, slides, test-cards and cine-films over the greater Birmingham area. G3KBA/T, G3KFE/T, G3EJO and G3BA are forming the r.f. nucleus with G3DFL supplying the pictures. A programme of monthly meetings is planned, and anyone interested is invited to contact the above stations.

Chelmsford have acquired a camera tube and work is proceeding on a camera control unit. G3CVO/T has built what promises to be the simplest ever "picture" generator—four 12AT7s giving vertical black or white bars, cruciform, grating, contrast bars, or line sawtooth. This unit can be used to test and correct almost every fault that can occur on TV equipment without the need for expensive testgear.

G3KFH/T at Worthing brings the number of Amateur Television stations in the United Kingdom to 17. Southampton are also active and have all the necessary video gear built. News of Scottish and Welsh activity is awaited; although there are many Amateur Television enthusiasts in both countries, there is as yet no /T station on the air in either. Over 440 members of the British Amateur Television Club are now active, recent new members being as far apart as Costa Rica, Poland, Israel and Yugoslavia!

*10 Baddow Place Avenue, Great Baddow, near Chelmsford, Essex.

Osram 912-Plus

THIS new book, published by the Osram Valve and Electronics Department of the G.E.C., gives details of the construction and operation of the Osram 912-Plus high quality amplifier developed for the home constructor. The amplifier has the same basic circuitry as the 912 introduced last year, but incorporates a six-position input switch which provides for radio and microphone input as well as allowing for the different characteristics of four types of records.

The Osram 912-Plus amplifier was demonstrated at the Earls Court Radio Show.

British Institution of Radio Engineers

THE "Clerk Maxwell" Premium has been awarded by the Council of The British Institution of Radio Engineers to F. N. H. Robinson, M.A., for his paper "Microwave Shot Noise in Electron Beams and the Minimum Noise Factor of Travelling Wave Tubes and Klystrons" published in the February, 1954, issue of the Institution's *Journal*.

Some of those who attended the successful Manchester V.H.F. Meeting on September 17. The 2m station is in the background and the single skeleton slot aerial in the centre of the picture.

TWO METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

MAINTENANCE of activity on the v.h.f. bands during the winter months, when conditions are rarely good enough to provide the incentive of E-DX or even good G-DX has been a problem for many years. What is hoped will attract many operators is the new Cumulative Activity Table (based on a similar one sponsored by *CQ Magazine*). Initially it will be confined to 144 Mc/s but as soon as there is sufficient demand it will be extended to 420 and 1250 Mc/s—and even 10,000 Mc/s!

It has long been felt that any v.h.f. table should be arranged in such a way that patience, hard work and regular activity will play as important a part as good QTH, high power and multi-element aerials. The main factor of a high score in this new table is, therefore, activity. Scores for each month will be listed as well as the cumulative results of each station. The first monthly table will cover the period commencing at 00.01 G.M.T. on December 1, 1955, and ending at midnight on December 31. It will be followed by the January table and so on. To enter, all that has to be done is to send the monthly score to reach G2AIW on or before the 20th of the following month.

Scoring. Stations may be contacted up to 5 times per month for credit. Two points are counted per contact per station per day up to 4 contacts a month (total 8 points) and 10 points for a fifth contact making 18 possible points per station per month.

Multipliers. A multiplier of 1 is used for each county worked and a multiplier of 2 for each country.

Irish News

Activity in Eire is increasing on 2 m. **EI4E** has now made contact with EI4R (Listowel, Co. Kerry) and the latter station has been hearing G2ADZ. **EI9C** (Dublin) is a newcomer to the band with a strong signal and a good aerial system. He has worked G6XM (York), G3GPT (Preston) and GI3GXP. Another Dublin station active is EI5Y. **EI2W** has also been very active, but has no important DX to report.

**21 Bridge Way, Whitton, Twickenham, Middlesex.*

F9CQ's Summer Station

F9CQ has sent some details of his summer station which will be of interest to those who have carried out tests with him. The 2 m transmitter is small, an 832 driving an 829B drawing 200 mA at 400 volts. The aerial is an F8OL-type 4-over-4. For 70 cm the line-up includes a QQE06/40A tripler followed by another QQE06/40A as a straight p.a. drawing 180 mA at 400 volts. The aerial is a 16-element affair designed by F8OL.

For reception on 2 m, the converter comprises a cascode r.f. stage (6AK5 and EC80), second r.f. stage (6AK5) and mixer (6AK5). The oscillator is a 12AT7, the first section using an 8200 kc/s crystal operating on its third overtone; the second section quintupling to 123 Mc/s. The tunable i.f. range is therefore 21 to 23 Mc/s. A W1HDQ-type converter with an i.f. of 28 to 30 Mc/s is used on 70 cm. All the constructional work was done by F8MX and F9CQ.

Although the equipment is modern, it is all within the scope of the average v.h.f. amateur. F9CQ's success, admittedly, has been influenced by an excellent location, but similar results can be obtained from any reasonably good site. The results on 144 Mc/s are comparable with those of other stations in clear areas, 'phone contacts to the north (i.e., Great Britain) being often of the order of 250 miles on 2 m. On 435 Mc/s contacts up to 200 miles were often possible.

I.V.H.F. Society Dinner held at Shelbourne Hotel, Dublin, September 30, 1955. The Minister of Posts and Telegraphs (Mr. S. M. J. Keyes) is fifth from left. Others in the picture include EI8N, G6CL, G4KD, G5QA, EI2W and G2WS. The "Millan" trophy is in the centre of the table.

Station Reports—Two Metres

On the whole, 2 m conditions during the period up to October 21 have been poor, although there have been a few bright periods when stations in the Midlands and West were well received in the South. Scottish stations have again been worked at good strength in Yorkshire and Lancashire and one or two heard by southern stations. The Channel Islands, some PA0s and ON4s have been worked also, but there has been no real consistency in the general conditions. Apart from the unexpected, it appears that this will be the case for the near future, but we live in hope!

B.R.S.19162 (Dewsbury) sent a photo which gives a good idea of what people in the valleys have to overcome. His results are therefore most creditable. **B.R.S.6327** (Earlsfield) found the band irregular, with much fading on distant signals. Longer television hours with the advent of the London I.T.A. station seem to have cleared the band completely—or is it hibernation owing to colder shacks?

G3JGJ (Plympton) has had a few contacts but considers general activity to be low. A surprise QSO and best G-DX so far, was G5BM (Highnam, Glos.) on September 30. G6XX (Howden) has been heard for the first time and the skeds with G2ADZ (Woolacombe) and GW2ACW and '5BI have been running. The two Welsh stations are received poorly owing to QSB, which does not affect G2ADZ, who is generally S9+ at Plympton. Some local stations are now being worked in Devon, in spite of the 2,000ft Dartmoor Hills. G8DA (Exeter) has been contacted again and '3MU heard.

G3JWQ (Ripley, Derby) a newcomer to 2 m is using a modified 1143 transmitter running about 8 watts, a 6-element Yagi at 35ft and a G6UH-type cascode c.c. converter into an HRO or HQ120. Some G-DX has already been worked, G6OU (Basingstoke) being about the best so far. **G3CCH** (Scunthorpe) has not had much time, but has again been working stations in the north and north-west. Contacts have also been made with GM3EGW and GI3GXP and excellent signals received from EI2W. PE1PL was called several times but only two QSOs (October 13/14) resulted.

G2AHP (Perivale) has worked over 56 different stations during the month in spite of low activity. The use of a 12 Mc/s crystal to clear TVI seems a good answer to that problem. A letter has been received from VQ4FB (ex-G3CAT) who is on 2 m and says that much longer distances can be worked in Kenya than are possible here. **G3GBO** (late of Denham) who is also out there, expects to be home for good at Christmas. **G6XX** (Howden) found conditions patchy but still managed to work several southern stations including GC3EBK and G2ADZ. G5KW/M was worked whilst returning from the Mobile Rally at Oxford and '6AG/M was heard.

G8PX (Oxford) says conditions were very good from October 9 to 11 and many new QSOs were made with the London area. '8PX acted as control station for 2 m in the Mobile Rally. **G8VN** (Rugby) recently met G3KHA (Bristol) in person and a sked was arranged; so far no luck, however, although G3GNJ (also Bristol) was worked the previous night. Conditions were good at Rugby in the first part of the period but they (and the activity!) fell off towards the end. **G4JJ/A** (Chesterfield) temporarily lost his slots in a gale and put up a 3-element beam 6ft high indoors at his /A QTH and with this makeshift arrangement worked several London stations on October 11. '4JJ found conditions fair and activity low the few times he has been operating lately. **G5MR** (Hythe, Kent) had a remarkable experience on October 8 on an apparently dead band when he heard (for the first time ever) a Northern Ireland station, GI3GXP at 362 miles. It is a great pity no QSO resulted—the transmission was confirmed by post. GI3GXP was using only 10 watts at the time. Otherwise conditions have been poor or activity low (we think mainly the latter.—ED.).

B.R.S.16075 (Shirley, Southampton) heard GM2FHH on an indoor dipole at 559, a remarkable achievement. Interest in v.h.f. is getting a good hold in the Southampton area, and G5LR will be using a cascode converter soon, similar to those used by G5OB, '3BHS and '16075. The local interest in Band II and III converters has apparently given some people the idea that perhaps the v.h.f. operators are not so silly after all!

G3KHA (Bristol, 4) found a falling off in activity except on September 19 and October 9. Although the band has otherwise seemed dead, however, it has happened that the first station heard, and possibly worked, might be 100 miles away with a good signal, so it appears to be low activity rather than low conditions which causes lack of signals. G8AL (Chingford) and '3ANB (Brightlingsea) were worked in this way, with little or nothing else heard. '3KHA will be calling and listening with the beam towards London and the east every Sunday morning from 08.30 to 09.00 G.M.T. His frequency is 145.521 Mc/s.

Mr. T. Gallivan (EI4E) of Killarney with the International V.H.F. Society's "Millan" Trophy awarded to him for outstanding v.h.f. work in a difficult location.

G8LN (Plumstead) has a new beam working, with a remarkable increase in received signal strengths (four "S" points in many cases). Most of the improvement appears to have come from the extensive tests on dimensions and type of feeder. Air spaced co-ax seems to have solved the problem. G5KW and '8KW are thanked for the great help they gave in the matter. **G3ANB** is having trouble with B.B.C.-TV and I.T.A. and is regrettably QRT (*pro tem.*) during TV hours. It is hoped he will soon be fully active again. The G8LN/'3ANB sked is now on Sundays at 18.30 G.M.T.; after it, both stations look for other contacts. '8LN thinks the lack of activity in the London area between 18.45 and 23.00 is amazing although Kent and Essex stations are often very active. With regard to *Worked and Heard* limitation of over 100 miles, '8LN thinks that this should be 50 miles for the "low powered strugglers." Emphasis should be put on stations heard, especially by newcomers to the band.

G5BM (Highnam) now receives signals from the east much better than at his previous QTH in Cheltenham; a better path also exists to the south and south-west.

G2ADZ (Woolacombe) who was weak before, is now usually S8. '5BM is eagerly awaiting the next Continental opening as stations worked around London are now too numerous to mention! Midland stations are down but the loss in this direction is amply compensated for by the gain in others.

"QRM Corner"

We hear that 2 m activity in the Blackpool-Fylde-Preston areas is reaching an all time record. Those regularly involved are G6KK, '5VN, '6MI, '2NY, '5TH, '3GPT, '3HWC, '3VX and '2ACT. Regular skeds take place every night at 19.00, and after TV closes down. However there is also considerable activity during television hours. Contacts with stations in London and southern areas are always welcome. It is noticeable that although London and Home Counties stations are frequently heard, it appears that they seldom beam north and apparently do not search the low frequency end of the band!

Two Metre News from Scotland

GM6WL (Glasgow) reports a lull after the spell of excellent conditions a couple of months ago. The Glasgow V.H.F. Group has resumed its meetings. GM3NG has added an 829B p.a. to his 522, with a very much improved signal. '3INK is also constructing a similar p.a. As '2CHN acquired an 829B in a "swindle" it appears that many strong signals from Glasgow should be audible in the south next season.

Signals in the heart of a great city are notoriously unreliable, but GM3DYC's experiences during Two Metre Field Day are interesting. With a 4-element Yagi 17ft above the roof of a building 150ft a.s.l. in Glasgow, EI2W was "terrific," with G5YV a close second. G3HII/P, 3DA/P, 6XM, 3ABA/P, 3IUD, 3IWJ, 3AGS/P, 3CCH and GI2FHN were also heard. GM6WL is constructing some 25 cm gear and hopes to report further soon.

GM2FHH (Aberdeen) found conditions poor except on October 9, when G3GPT, '3IRA and '5YV were worked. G5YV was instrumental in getting the QSO with '3IRA. The latter station was audible for hours in Aberdeen! G2ATK and '3BW were also heard but no contacts resulted.

The Month in Wales

GW3GWA (Wrexham) also had a good day on October 9, stations as far away as Lincolnshire, Somerset and North Yorkshire being worked (13 counties in all). Otherwise conditions and activity have been poor.

Seventy Centimetre News

G8PX (Oxford) is still "battling" for more grid drive to the final 6J6 doubler in a G8SK-type transmitter, with tests on the new G2WJ coupling loop coming on well. It is hoped to be operational very soon.

G2WS (Tadworth) calls CQ on 435.9 Mc/s with a fixed beam (northward) every evening from 22.50 to 23.00 G.M.T. '2WS would be happy if operators would state definite times of working, or if fixed times for tests could be agreed between stations.

G3CCH (Scunthorpe) has been trying to get his 70 cm receiver working, but is still not satisfied. A scaled down version of the 6-over-6 slot beam has been constructed for the band. Careful measurements and adjustments of element lengths have been well worthwhile. Elements other than directors are of $\frac{1}{8}$in. diameter hand drawn copper; directors are 14 s.w.g. copper. Under poor conditions '3CCH has been heard by G3IOO (Oswestry) at 439, whilst G3IUD (Wilmslow) and G3GMX (Timperley) both gave 579 reports. A stack will later be used for reception. '3CCH thinks the use of f.m. might be an improvement over A3 on 70 cm for the following reasons: (1) Maximum power input could be used (c.w. ratings); (2) Less cost; (3) No difficulty due to attempted modulation of a tripler; (4) No danger of damage to *expensive* transmitting valves. Comments will be welcomed.

G2XV (Cambridge) is still hoping for some 70 cm activity from Hunts, Suffolk, Bucks and Kent, etc., etc.! **G6NB** (Brill) is now active and has already worked G2XV and '3KEQ.

* * *

That's all for now; not very inspiring but we hope for better next time. Reports for next month by November 21, please!

Worked and Heard on Two

(G–DX over 100 miles, and E–DX.)

B.R.S.6327 (Earlsfield) September 18–October 16, 1955.
Heard: G2ATK, 2BVW, 2HCG, 2HDY, 3FAN, 3IPV, 3IVF, PA0FB, PA0IKS.

B.R.S.16075 (Shirley, Southampton) September 18–October 18, 1955.
Heard: G2ADZ, 2BMZ, 2HCG, 3AGA, 3AUS, 3DLU, 3FIH, 3FMO, 3IIT, 3IRA, 3KHA, 5BM, 6NB, GC3EBK, GM2FHH, GW2ACW, 3EJM, 8UH.

B.R.S.19162 (Dewsbury, Yorks) September 12–September 25, 1955.
Heard: G2AIW, 2ATK, 2BVW, 3DA, 3ENY, 3FAN, 3FJR, 3FUR, 3GHO, 3GPT, 3GSO, 3IIT, 3IVF, 3KFO, 3WW, 5DS, 5ML, 5JU, 6AG, 6NB, 6WL.

G3JGJ (Plympton) September 19–October 19, 1955.
Worked: G2ADZ, 5BM, 8DA, GW2ACW, 5BI. *Heard:* G3AET, 3AGA, 3DLU, 3MU, 6XX.

G3KHA (Bristol) September 19–October 14, 1955.
Worked: G2AHP, 2DVD, 2RD, 2YC, 3ANB, 3FQS 3GGJ, 3GHO, 3HWJ, 3KEQ, 3WS, 3WW, 8AL. *Heard:* G2AIW, 2BVW, 2FJR, 2UJ, 2XV, 3BA, 3DGI, 3FD, 3GPT, 3IIT, 3IJB, 3ITW/A, 5BC, 5DS, 5KW, 5LN, 5YV, 6AG, 6OX, 6RH, 6TA, 6XX, 8KJ, 8KW, 8RW.

G5BM (Highnam) September 18–October 16, 1955.
Worked: G2ADZ, 2AHP, 2BVW, 2FJR, 2HGR, 2RD, 3AUS, 3CCH, 3DF, 3DMU, 3EPW, 3FAN, 3FQS, 3FSD, 3GGJ, 3GOP, 3GPT, 3HZK, 3IEX, 3JGJ, 3JZN, 3WW, 5BC, 5LN, 6AG, 6AG/M (nr. Bromley, Kent), 8AL, 8DA, 8KW. *Heard:* G2DSP, 3FNL, 3KBL, 3WS, 5RD, 6WU, 8VZ.

G5MR (Hythe, Kent) September 20–October 19, 1955.
Worked: F3JN, G3ION, 5OB. *Heard:* F8OL, G2HCG, 3GHO, 3WW, 6NB, 8PX, GI3GXP.

G6XX (Howden) September 19–October 19, 1955.
Worked: G2ADZ, 2BBN, 2NY, 3DGI, 3FUA, 5KW/M (Oxford), 8KL, 8VZ, GC3EBK. *Heard:* G6AG/M (Oxford).

G8VN (Rugby) September 20–October 16, 1955.
Worked: G2AIW, 2ATK, 2FNW, 3ARX, 3AZT, 3CKQ, 3DKF, 3GHU, 3GWJ, 3HSX, 3IOO, 3ITF, 3JWQ, 3JXN, 3JZG, 3JZN, 3KBL, 3WS, 3YZ/P, 5AM, 5JU, 5ML, 6TA, 6XX, 8AL, 8UQ/P.
Heard: G2AK, 2BVW, 2COP, 2CZS, 2DRA, 2DVD, 2FJR, 2HGR, 2NY, 2RD, 3BJQ, 3BW, 3CCH, 3DF, 3DO, 3DVK, 3EPW, 3FAN, 3FMO, 3FUW, 3GHO, 3GVF, 3HBE, 3HTY, 3HWJ, 3IRA, 3IVF, 3JZW, 3KEE, 4JJ/A, 4PS, 5BD, 5VN/A, 5YV, 6AG, 6OZ, 6RH, 6YU, 6XM, 6ZP, 8VZ, GW3GWA.

GW3GWA (Wrexham) September 20–October 20, 1955.
Worked: G2BVW, 2FJR, 3DKF, 3DLU, 3GGR, 3IRA, 3JWQ, 3JZG, 3NT, 6SN/M, 6ZP.

Wireless World Diary 1956

THE *Wireless World Diary* for 1956 contains 80 pages of reference material in addition to the usual diary pages of a week to an opening.

The Diary—now in its 38th year of publication—can be obtained from R.S.G.B. Headquarters, price 6s. (leather) and 4s. 3d. (rexine). Both prices include postage.

Technical Articles Wanted

THE Editor will be pleased to consider for publication articles which have a bearing on any aspect of Amateur Radio, including Amateur Television. Short articles of a constructional nature are particularly required.

THE MONTH ON THE AIR

By S. A. HERBERT (G3ATU)*

OCTOBER turned out to be one of the most interesting months for years. Normally, when we talk about the "DX bands" we are referring to the higher frequencies, but this month that term applies equally well to everything from one-sixty metres right down to ten. The sun spots, in fact, have been doing their stuff in a way which promises well for the future. Meantime, to the month's happenings, starting for a change with the very considerable doings on the Top Band.

One-sixty Metre DX.

Already, there have been openings over the North Atlantic path, with most activity at the week-ends. Old hands like W1BB, W3RGQ, W3EIS and others have been putting fair signals across on occasion and snatches have been heard from KZ5PB, of whom more later. The big news, though, concerns the tests with New Zealand, organised to coincide with the Autumn Equinox.

G6CJ (Stoke Poges) sends an interesting account of the tests. Skeds were arranged between G6CJ, G6GM, ZL1AH, ZL3GQ and ZL3RB, with others participating at times. Dud mentions the tremendous difference to dates, times and possibilities made by even a small change in geographical location. For the east side of the U.K., this meant an opening of only a few days, around October 14, whereas further west, G6GM (Devon) and EI9J could expect a whole month as well as better signal strengths. However, everybody appears to have heard something and several QSOs resulted. The '6CJ/ZL1AH signals rarely exceeded the noise-level, but they did have a QSO on October 15. Dud also worked ZL3GQ and remarks on the really amazing signal from ZL3RB, who worked G3PU and EI9J (twice) and has been talking to G6GM with signals reaching the "nattering level" on peaks. G6LB tried hard, but was probably just too far east; G3SU joined the party rather too late for success. Times for the London area ranged from 06.00-06.30 on October 1 to 06.30-07.00 by October 20. To the west, openings were longer. **G6GM** (Holsworthy) had a very successful time of it. He worked ZL3GQ twice, with '3GQ peaking RST569 and had no less than seven "solid" QSOs with ZL3RB, who was RTS579 at his best. Strangely enough, nothing at all was heard this year from ZL1AH. '6GM has made a start with the Ws and has worked W3RGQ (Shelly) and W3EIS.

GM2BUD has sent details of this year's Top Band tests arranged by W1BB. From now until March, 1956, **W1BB** will be on 1815 kc/s every Sunday from 05.00 to 07.30 G.M.T. (barring unexpected sickness, business or other emergency). The usual 160m test procedure will be used. When no DX is being heard or worked, W1BB will call "CQ DX" or "CQ Test" during the first 5 minute period of every hour and each alternate 5 minute period. He will listen for DX calls during the second 5 minute period and each alternate 5 minute period.

W1BB will carefully tune from 1825 to 1875 kc/s for calls from British stations, the portion 1830 to 1840 kc/s receiving special attention. DX stations usually call W1BB on 1832-1833 kc/s but care should be taken to avoid interference to British coast stations. The whole of Top Band from 1800 to 2000 kc/s will be tuned periodically.

Operators wishing to arrange skeds should write to W1BB direct.

B.R.S.19107 (Beckenham) started checking the band in late September and has heard Ws each week-end since. So far logged are Ws 3EIS, 3FBV, 3RGQ, 9PNE (S6 at 06.07) and KZ5PB (RST559 at 05.30). John had the galling experience of listening to the Gs working ZL and hearing nothing of the latter, but he intends to keep trying. **B.R.S.20106** (Petts Wood) was also out of luck with the ZLs, but he had no trouble with Ws 1BB, 8ANO, 9PNE and K2JIO, plus the W3s. **G3ATU** left things rather late and heard no sign of a ZL. What *did* come through each morning around 07.30 were the most appalling warbling noises. Centred on 1880 kc/s these sounds could be heard rippling away as far as 1840 kc/s. PCH came through them all right, but ZL was definitely out! KZ5PB has been mentioned and his usual frequency—1825 kc/s—raises the question of band-edge working. A number of British stations habitually work below 1830 kc/s in the mistaken belief that DX stations will hear them first and so work them. Far from this being the case, QRM in the U.S.A. is so heavy up to 1828 kc/s that they have difficulty in hearing any DX below that frequency. They suffer from band-edge enthusiasts too! So the best chance of being heard at DX and the *only* way of being sure of getting a fair crack at the rare ones is to keep above 1825 kc/s.

So much for international DX; now to DX of a domestic kind. **G3JNX** (Manchester) spent a week-end in Montgomery, where he helped to put GW3ESJ back on the air. Some 250 ft. of wire was strung up, despite hazards posed by possible electrocution from a local power supply line and eventually **GW3ESJ** was in business. Twenty-five stations were worked in one evening and as a result of '3JNX's visit, GW3ESJ promises to be on the band once a week, probably on a Tuesday, from 20.00 to 23.30 on 1850 kc/s c.w.

Ten Metres

The most extraordinary things have been happening of late. After years of quiet, except for short-skip sessions and occasional openings for weak DX, the band burst suddenly into furious activity. For about ten days between October 5 and October 15, the American phone band sounded much as it used to do in the "good old days" of 1947-48, with really strong signals arriving from all districts from W1 to W0, while the band from 28500 kc/s down produced signals from all continents. Most of the activity was on phone—ten has always been predominantly a phone band—but some rare prefixes could be heard on c.w. also. Things became quiet again

*Roker House, St. George's Terrace, Roker, Sunderland.

after the big opening, but obviously the band is now well worth watching.

G3WP (Chelmsford) is back after a major rebuild aimed at the TVI menace. Checks with a sensitive indicator reveal no harmonic energy except on 21 Mc/s, where a small amount shows, so things seem to be more or less under control. Ten is '3WP's favourite band, so he was pleased to find it open. Since October 9, he has heard or worked W1, 3, 4, 8 and 9, HZ1HZ, FF8JC, ZS9G, CX, OQ5, PY, VQ2, ZE and ZS6. **G3AAE** (Barnet) worked Ws and a VE3 on c.w., then changed to phone for QSOs with EA8BV, ZD4BR, ZD6RM, ZE, PY, 4X4 and some more Ws. **G2FQR** (Walsall) worked W1, 2, 3, 4 and 8 and LU1DCH and heard such DX as CR6, HP3DA, OA4BK, W2FKU/VO2 and CT2AG plus numerous African and American phones, but he reckons the QRM, reminiscent of twenty and forty, proved too much for his own signals. **G3CUC** (Windermere) worked W1, 2, 3, 8 and 9 and heard W1ULY/M enjoying a QSO while driving along a Connecticut highway. KG4AV was also on as was Kurt Carlsen, working strings of Ws from W2ZXM/MM. **GM3ITN** (Clydebank) took advantage of a spot of leave from DL2YI to account for HX1HZ on c.w., but he had no luck with VP8AI.

Dick Poppi (Beckenham) heard his first Ws for four years, plus ZS9G, VQ2, LU and PY. **B.R.S.20135** (Newport, I.o.W.) logged ZS1, 6, 9, W5VY, TA3US, ZC4RX, YV5, ZB1, 4X4 and other 'phones, while **R. J. R. Crocker** (Plymouth) mentions ZS3AB, KP4WN, TG9JW, VP6HR, OA5G, HK3PC, TI2ES and W3CHT/MM (near Trinidad, running 60 watts to a 12ft whip) among his 'phone findings. **B.R.S.19107,** who didn't listen on the band until a few years ago, found his country total increased by 20 in a few days! C.w. came from VP8AI, HZ1HZ, ZS5V, ZE3JJ, CX and UQ2 and 'phone from ZP5IT, 14 CXs and the usual PY/LU, ZS, etc. **B.R.S.20106** mentions W6 and 7 galore on 'phone and logged 4S7YL. UJ8KAA was on the key, but remains purely of academic interest. **G3ATU** considers his best 'phone catch was VK6VM, heard weakly at 09.50 calling "CQ." W6RFX was very strong, as was W7TPT (Ariz.). It was amusing to note the number of people caught unprepared by the band's sudden opening. Several stations were heard to admit they were using fifteen and even twenty metre beams *and* they were good signals! Dick Poppi found VK9DB, CR9AH and VS6CL were the most consistent 'phones. On c.w. he lists AP2L, VS1s BO, GT, GR, VS2s DB, CV, CR7AD, 9AH, KH6NAB, KL7ZG, W6ZZX/KH6 and VP8AQ.

Fifteen Metres

As could be expected after the ten metre openings, fifteen has been wide open nearly every day for all kinds of DX. From the early morning VK/ZLs to the late evening South Americans, the band has been chock full, which makes a pleasant change from a year ago, when all and sundry were complaining of lack of activity.

G3AAE found c.w. activity on the increase and dealt with VK9DB, VS1GX, VS6CQ, JA, OA4ED, VQ2GW, ZD6RM and ZL2, 3, 4, then on 'phone he worked KC6CG, VP7NI, VP9L, HR3HH, HK4AM, VK2, 3, 4, ZL, YI and VK9DB again. **GM3ITN's** c.w. accounted for 3A2BH, WN1ELA, WN1FRR and KN4DKE. **B.R.S.18017** (Warwick) increased his 'phone score with EA9AZ, FB8BZ, HC1FS, HZ1TA, VQ5FK and VQ3DQ. **B.R.S.20135** lists VS1FK, VK2, 6, VS6CW, 6CL and 6AE, ZS3AB, ZS4FF, ZD4AE, EL3A, VQ2HW/P and VP8AQ. **B.R.S.19107** picks out on 'phone VK9DB, VR2CG, KC6CG, JA1CO, VU2RC, KH6AR and VP1SD (Box 239, Belize), while c.w. DX was from UA9CC, VE7KC, VK6RU and a UC2.

B.R.S.20106 heard plenty, both A1 and A3. His 'phone list specifies KR6CR, CR9AH, PZ1RM, VU2EJ, 2RX, VR2CG, VK9 and ZLs in quantity and W5, 6 and 7, with VS6, VP7NI, YN1AA, ET2US, VK, ZL and Novice stations KN5BTE, WN7YYP, WN7ZWN and KN0BZK as his best on c.w. **R. J. R. Crocker** mentions the "jammers" which have appeared on three frequencies in the band. Whether they're fundamental, harmonic or spurious, they are still strong enough to be a first-rate nuisance when they start up. Dodging these, R. J. R. found KZ5MB, CE3DY, 3QK, TG9AD, ZD1SW, KC6CG, VP8AQ, 8BD and 8BF, MP4BBW, ZD3BFC, KH6AXH, YN1KK, CN2AD, FM7WQ, VE5RO, 6MJ, 6PP, W6VNT/VE8, all on 'phone. **G3ATU** heard DU6IV on the key at 14.00. **G3ISV** worked all W districts except the sixth.

Twenty Metres

Despite the attractions of the two higher frequency bands, twenty still more than holds its own and has produced considerable comment. **B.R.S.20249** added new countries to his list with VP1HA and KL7ZG ('phone) and ZL4CK (c.w.) and logged also TG9AD, HZ1TA ('phone) and the mysterious VK8CH (21.30, c.w.). **B.R.S.20487** (N. Finchley) logged 4S7WM, VE5RN, 5DR, KG1FR, KA, VK and ZL ('phone), while **B.R.S.20317** (Bromley) was pleased with FK8AB (14030, 13.00-14.00), UD6KAB, FQ8AX, VE4, 7, 8, VP8BD, 8AI, FB8BR, FP8AP, VP9TT and VK1RA (14064, 17.00) on the key and with VE8NX, HI6EC, TG9AD, LU5XE (S. Patagonia), VP2DA, PX1YR, KG6NAA, ST2DB and EL1FI/MM on 'phone. **B.R.S. 20788** (Glasgow) is really up against it. He is in "digs" and is restricted to indoor aerials. Not only that: he is only twenty-five yards from the Scottish Third Programme transmitting aerial! 'Phone DX in these circumstances is rare, so he was delighted to hear ZS1SC at S8 one evening. The present receiver has no r.f. stage, but a better one is on the way and should improve things.

GM3ITN passed his 100 mark with the help of CX5PV, JA6AO, VK, MP4JO, TI2BC and VP7NI on c.w., while **G3AAE** talked to ZC5CT, KV4BK and 3A2BH (the HB9 gang) on c.w. and with 3A2BE (status unknown but name Claude) on 'phone. Also using 'phone, **R. J. R. Crocker's** best were FM7WF, MP4KK, VQ6LQ, ZC5CT, FI8AO and VP7NK. **B.R.S.19017** says VR2BZ is on most mornings (08.00, c.w.). **B.R.S.20106** reports c.w. activity from VK9RM (15.00), VP8AI, CE7ZJ, VR2AS (08.05, chirpy) and VK1RA, with VK6s on 'phone around 15.00. **Dick Poppi** picks KC6CG, VK1AR, CE7AA, FB8BR, 8BS, XZ2OM and XW8AB as his best c.w. **B.R.S.18017** selects FM7WP, JA1AGU, KL7BFW, OY7TE, ZD2JWX and UL7KBB on the key and HH3DL, KL7AON (Biorka Is.), ST2DB and TG9AD as the best on 'phone. **G3ATU** listened to ZA2G calling "CQ" and wondered what the position would be if a genuine ZA came on the air. Quite possibly, he would be restricted to working "Iron Curtain" countries!

Forty and Eighty Metres

Conditions on both bands seem poor, probably as a result of activity elsewhere. **B.R.S.20106** logged 3A2AH, ZLs, VP2LH (23.45) and W6s JDH, MUB, LNR, OYD, RW and OEG on forty c.w. and YV5BJ, VE, W4 and KN5BID on eighty c.w. On the latter band, **B.R.S.**

19107 heard UA9DN, ZL3GQ and ZL3QX, with ZL2HV, TI2AJ, YV4CA and CO2OZ on forty 'phone.

Overseas News

An interesting account of life in the Falkland Is. comes from **VP8BL**/G3CUO (Port Stanley). The climate is similar to that of the Western Isles—apart from breezes, gusting to 74 knots! With beef 5d a pound and "Highland Dew" 22/6 a bottle, life could be worse! Current activity is from VP8s AB, AC, AH, AI, AY, BC, BJ and BL on the Falklands proper. VP8s AF, AG, BI and BK are on South Georgia (this is interesting) and VP8s AQ, BD, BF, BG and BH at the various Bases in the Dependencies. VP8BD (Port Lockroy, Graham Land) is active on 21 and 28 Mc/s and is probably the first VP8 to use 28 Mc/s since the sunspot minimum. The G.P.O. has asked Vic to point out that his call —VP8BL—is the last to be issued. Cards keep arriving for VP8GK and VP8DQ who are, of course, non-existent. Vic's best DX with 30 watts c.w. is G5ZK and he remarks that a "local" pal, ZD9AC, is on 14 Mc/s and should be heard well in the U.K.

G2BFK (Harrow) passes a message from OX3UD, who is once more active, but who will be unable to QSL before July, 1956. Gerry Bateman is home after a spell as **ZC4PB** and would like to thank everyone for the fine QSOs he had from Cyprus. He has 79 confirmed so far out of 110 countries worked, so DXCC should be on the way. If anyone is short of a ZC4PB QSL, a note to 21 Meadow Road, Woodhouse Eaves, nr. Loughborough, will do the trick. ZC4GF, too, is back home as G3AGF.

G3KHU (Barnsley) is the new call of Ralph Gabbitas, well known for so long as one of the YI2AM gang. Ralph has two dipoles out of phase on a 35ft pole, with an 813 giving the power. He finds DX is not quite as difficult to come by as he feared. Contact has been made with ex-YIs Geoff Voller (G3JUL), now of GB2SM, G3BZL and G3JDD.

* * *

And that terminates the month's proceedings. Please send your reports to arrive if possible by November 20. As for December, in view of the annual Christmas postal delays, here is a preliminary plea to post reports for that month in good time. G3ATU enjoys compiling this article, but he would prefer not to have to do it on Christmas Day! Good hunting, 73, and see you next month.

DX on 32 Mc/s

WITH the opening of the 28 Mc/s band for long distance communication it is expected that a v.h.f. network operating on 32.215 Mc/s in Southern Rhodesia may be heard in the United Kingdom. Transmissions are on f.m. with a maximum deviation of 20 kc/s. The stations normally announce themselves as either "fixed" or "mobile." Reports on reception of these signals will be welcomed by Ivan J. Wood (ZE3JJ), c/o Radio Society of Southern Rhodesia, Box 2377, Salisbury, Southern Rhodesia.

Capt. Andy Woods, EI3L (left) and Mr. Alan Jackson, EI8L (second from right), Honorary Secretary and Vice-Chairman respectively of the Irish Radio Transmitters' Society, with the President of the R.S.G.B. (Mr. H. A. Bartlett, G5QA), Past President and Council Member, Mr. W. A. Scarr, G2WS, and the General Secretary (Mr. John Clarricoats, G6CL), at the I.R.T.S. Dinner-Meeting held in Dublin on September 30, 1955.

Frequency Predictions for November, 1955

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
28 Mc/s	1400—1600	1200—1600	1000—1700	0800—1600	0900—1500	0800—1230	0900—1100	0900—1100
21 Mc/s	1200—1830	1000—1900	0830—1900	0700—1800	0600—1600	0600—1500	0600—1500	0700—1500
14 Mc/s	1000—2130	0830—2100	0700—2200	0600—2200	0500—2000	0500—1800	0500—1700	0900—1630
7 Mc/s	2100—0800	2200—0700	2000—0600	2200—0500	1800—0400	2000—0400	1900—0200	1500—2100
3.5 Mc/s	0000—0600	0600	0100	0400	2200—0400	2100	0200	1700

These predictions are based on information provided by the Engineer-in-Chief of the Post Office. All times are G.M.T.

R.S.G.B. NINTH ANNUAL

AMATEUR RADIO EXHIBITION

Royal Hotel, Woburn Place, London, W.C.1

from
WEDNESDAY, NOVEMBER 23rd, 1955
to
SATURDAY, NOVEMBER 26th, 1955

THE EXHIBITION WILL BE OPENED AT 12 NOON ON WEDNESDAY, 23rd NOVEMBER by VICE-ADMIRAL J. W. S. DORLING, C.B., M.I.E.E., M.BRIT.I.R.E.

Hours of Opening
11 a.m. to 9 p.m.
Admission Charge
1/-

EXHIBITORS' CATALOGUE

AIR MINISTRY

Royal Air Force

AMATEUR Radio has been a popular hobby with members of the Royal Air Force ever since 1924 when R.A.F. amateurs pioneered the inter-command short wave W/T network linking R.A.F. Stations from Gosport to Hong Kong. Today Amateur Radio enthusiasts still receive every encouragement and enjoy excellent facilities. For those who want to make their career in radio the Royal Air Force provides a first-class training leading to highly technical and important work.

The Royal Air Force stand shows R.A.F. radio technicians and Amateur Radio enthusiasts using radio in a typical Far East setting. Visitors will see servicing of R.A.F. ground communications receivers R.1475, and a complete range of tropicalized test equipment.

One exhibit depicts an R.A.F. Amateur Radio enthusiast's complete station which includes a 150 watt transmitter and a 12-valve superheterodyne receiver. This equipment enables the airman to keep in regular radio contact with the U.K. In the adjoining section are displayed examples of Amateur Radio transmitters constructed by members of the R.A.F. Amateur Radio Society. The Honorary Secretary of the Society will be there to meet members and others interested in Amateur Radio and the R.A.F.

A further item consists of four Morse receiving positions at which visitors may try their skill at reading Morse signals at speeds varying from 12 to 30 words per minute.

AUTOMATIC COIL WINDER AND ELECTRICAL EQUIPMENT CO. LTD.,

Avocet House, 92-96 Vauxhall Bridge Road, London, S.W.1

IN addition to the well-known range of "Avo" test gear, several new instruments are exhibited this year. These include the "Avo" Signal Generator Type 3 and the "Avo" Signal Generator Type TFM, both of which cover Bands I, II and III.

Visitors can also see the new "Avo" D. C. Amplifier, which will give a full-scale measurement for 3 x 10^{-13}A, on a scale approximately 3in. long, and a model of the "Avo" Radiac Survey Meter, which has been developed for the detection of high energy Gamma and Beta ray sources.

CLEMINSON'S AGENCIES LTD.,

36 Clifton Gardens, London, N.W.11

THIS Company provides a sales organization for several manufacturers of radio and electrical components and accessories of interest to the amateur. The following products will be exhibited:

Channel Electronic Industries Ltd. Band III Converters, Waveform Generators, Pre-amplifiers, High-pass Filters and Distribution Boxes.

Elstone Electronics Ltd. More than 90 different types of transformers and chokes will be shown.

A. C. Farnell Ltd. Silvered-mica capacitors, rotary switches, midget carbon potentiometers, "Tygan" and "Ragosine."

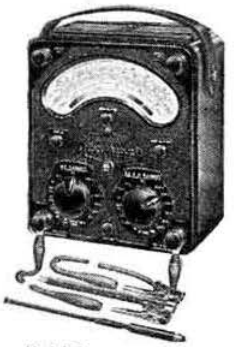
AVO

REGD TRADE MARK

DEPENDABLE *Electrical Measuring* INSTRUMENTS

at the **AMATEUR RADIO EXHIBITION**

Stand No. **16**



Model 8
Universal AVOMETER

AVO
VALVE CHARACTERISTIC METER

The "Avo" Instruments here illustrated, produced by the pioneers and leading manufacturers of multi-range electrical testing instruments, exemplify the best traditions of British design and craftsmanship.

AVO Wide Range
SIGNAL GENERATOR

"Avo" Instruments are renowned for their high standard of accuracy, their versatility, robustness and compact portability. Originality of design is combined with close attention to the practical needs of modern industrial and laboratory users.

AVO VALVE TESTER Type 160

AVO
ELECTRONIC TESTMETER

D.C. AVOMINOR

Universal
AVOMINOR

You can depend on "Avo". When choosing instruments, consult our complete Catalogue, a copy of which may be had free on application.

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

Avocet House · 92-96 Vauxhall Bridge Road · London S.W.1

'Phone VICtoria 3404 (9 lines)

G.9

Farnell Instruments Ltd. The "Transtesta."

Cleminson's Agencies Ltd. are also showing a number of items marketed under their own brand name.

Mr. D. I. Wiggans (G3ATL/M), of Leicester, who is the Company's Midlands Area Manager, will be in charge of the stand.

GENERAL ELECTRIC CO. LTD.,

Magnet House, Kingsway, London, W.C.2

THE General Electric Co., Ltd., is displaying a wide range of Osram valves and other electronic equipment for the Amateur Radio enthusiast.

Valves will be shown for f.m. feeder units, television and radio receivers, a.m./f.m. receivers and for audio amplifiers. There will also be a valve line-up for the transmitting amateur and a selection of cathode ray tubes for television and for instruments.

Television and radio converters will be represented by a Band III television converter and an f.m.-v.h.f. radio converter.

Another feature of the stand will be the Osram 912-plus home-constructor's amplifier suitable for use with radio, tape and microphone units.

HARWIN ENGINEERS LTD.,

101-105 *Nibthwaite Road, Harrow, Middlesex.*

HARWIN Engineers Ltd. are manufacturers and stockists of a wide range of terminal boards, terminal lugs and terminal connectors. The company also manufactures mounting brackets, mounting pillars and insulated stand-offs. Samples are displayed together with examples of the well-known Universal Circuit Tester.

ILIFFE & SONS, LTD.,

Dorset House, Stamford Street, London, S.E.1.

DISPLAYED on the Iliffe & Sons, Ltd. stand, are: *Wireless World.* Britain's leading technical magazine in the general field of radio, television and electronics; for 45 years it has provided a complete and accurate survey of current technique. Design data and circuits for every application are published regularly, whilst its news items embrace the wider aspects of international radio. Monthly, £1 7s. 0d. a year.

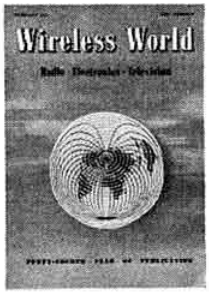
Wireless Engineer. Accepted by research engineers, designers and students as an international source of information for advanced workers. The editorial policy is to publish only original work, whilst the correspondence columns form a recognised debating ground. Monthly, £2 7s. 0d. a year (including annual index to Abstracts and References).

Technical Books. Selections from the comprehensive Iliffe range covering many aspects of radio and television, including "Cathode Ray's," *Second Thoughts on Radio Theory,* an entertaining and helpful new textbook; 409 pages, 25s. net.

J-BEAM AERIALS, LTD.,

Cleveland Works, Weedon Road Industrial Estate, Northampton.

THE experience and knowledge gained from the production of a complete range of Band I and Band III Television Aerials is now available from our Communication Division which offers many types of aerials for professional and amateur communications. The latest skeleton slot techniques are used in the 2 metre



WIRELESS WORLD

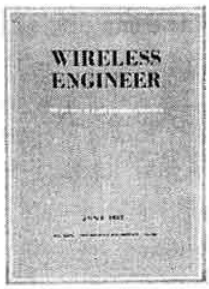
Wireless World is Britain's leading technical journal devoted to radio, television and electronics. Its pages survey the newest techniques in design and manufacture, and cover every phase of radio and allied practice. Descriptions of the latest equipment and components are regularly included.

2s. Monthly. **£1 7s. 0d.** a year.

STAND 6

Britain's Foremost Journals on Radio, Television, Electronics

WIRELESS ENGINEER



Wireless Engineer is read by research engineers, designers and students in radio, television and electronics, and is accepted internationally as a source of information for advanced workers; only original work is published. Regular features include abstracts and references compiled by the Radio Research Board.

3s. 6d. Monthly. **£2 7s. 0d.** a year.

ILIFFE & SONS LTD., DORSET HOUSE, STAMFORD ST., LONDON, S.E.1

Osram

nine · one · two

the most successful amplifier design

now...

Osram

nine·one·two PLUS

Six position fully screened Selector Switch, with or without pre-amplifier, to cater for all types of record, various types of pick-up, radio and microphone inputs.

This book gives details of how to modernise this popular Amplifier. Stage by stage wiring instructions are included for the improved '912', and there are many additional valuable features. By purchasing this book, you can read how to bring up-to-date your existing Osram '912' or obtain full details for constructing this versatile and remarkable Amplifier for High Quality Sound Reproduction. It costs 4s. 0d. from your dealer or by post 3d. extra from Osram Valve & Electronics Dept.

Visit our Stand at the R.S.G.B. Exhibition, Nov. 23—26, 1955

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

range of aerials including stacked arrays and the combination of skeleton slot and Yagi, now well established on Band III television as the slot beam. Standardized methods of construction offer the amateur the advantage of mass production methods enabling the relatively small quantities of aerials needed for communications to be produced on our television aerial production lines at mass-produced prices.

LABGEAR (CAMBRIDGE) LIMITED,

Willow Place, Cambridge.

THE two principal exhibits are the new LG300 Mk. II Amateur Table Top Transmitter and the Companion Power Unit/Modulator. The LG300 Mk. II has already achieved an outstanding reputation and the latest model displays the many new features which have been added since the original transmitter was exhibited last year.

The companion power unit/modulator has been introduced in response to many requests and matches the LG300 Mk. II both in styling and electrical characteristics. It provides high level modulation for the 813 using one of the popular diaphragm type crystal microphones. In the power supply, high vacuum rectifiers are used throughout to avoid an extended warm-up period. Separate circuit switching is provided together with remote "transmit/stand-by" control facilities.

In addition to the above, the well-known range of Labgear components and accessories is exhibited.

MEASURING INSTRUMENTS (PULLIN) LTD.

Electrin Works, Winchester Street, Acton, London, W.3.

MEASURING Instruments (Pullin) Ltd. will feature the well-known Pullin Series 100 Multi-Range Test Set and the new Miniature Multi-Range Test Set. Both have been designed as robust, accurate test sets fully covering all resistance and a.c. and d.c. voltage and current ranges required for testing most electronic circuits. The Series 100 has a sensitivity of 10,000 ohms per volt on all voltage ranges and the Miniature Test Set a sensitivity of 5,000 ohms per volt.

The MIP display will also include "VU" Power Level Indicators for V.F. circuits, Peak Programme Meters and examples of the complete Pullin range of precision and industrial grade electrical indicating instruments—both portable and panel-mounting.

MINIMITTER COMPANY,

37 *Dollis Hill Avenue, Cricklewood, London, N.W.2*

ONCE again the Minimitter Company is showing a complete range of transmitting equipment for the amateur. The well-known improved foundation units and the new de-luxe table top transmitter with a band-switched aerial tuning unit and a five stage low-pass aerial filter comprise the equipment for the low frequency bands.

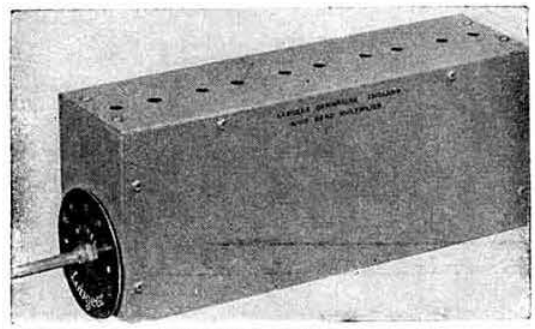
On the v.h.f. side there is a new exciter and medium power amplifier for 144 Mc/s which is built on the company's usual unit construction lines. A companion tunable converter is also available.

MULTICORE SOLDERS, LTD.,

Multicore Works, Hemel Hempstead, Herts.

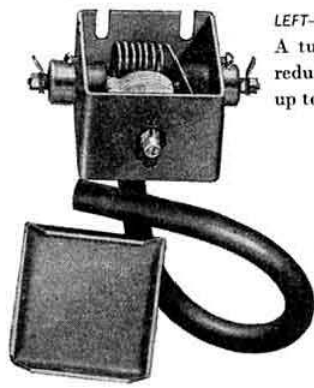
ERSIN Multicore Solder Wire which contains 5 cores of flux has been used exclusively for 16 years by most of the leading manufacturers of radio, television and electronic apparatus. No extra flux is required; it is contained in the correct proportions within the wire.

SPECIALIZED COMPONENTS EXPRESSLY DESIGNED FOR MODERN AMATEUR TRANSMITTERS



WIDE BAND MULTIPLIER E.5026

Greatly simplifies transmitter construction. Provides output on the 10, 15, 20, 40 & 80m bands. Price (in U.K.) **£5**



LEFT—"Harmonitrap" E.5025. A tuned anode trap for T.V.I. reduction. Suitable for valves up to 807 class. Price (in U.K.) **18/-**

RIGHT—Parallel feed R.F. choke for stages using Pi-networks. Conservatively rated for use in 150w amplifiers. Price (in U.K.) **10/6**

THE ABOVE COMPONENTS WILL BE ON DISPLAY AT THE R.S.G.B. EXHIBITION 23rd—26th Nov.

Labgear (Cambridge) Ltd.

WILLOW PLACE, CAMBRIDGE, ENGLAND

Telegrams: "Labgear Cambridge" **Telephone: 2494-5**

"2 METRE BEAM ARRAYS"

BUILT PROFESSIONALLY TO SUIT THE AMATEUR'S POCKET

3 STACK wavelength spaced Skeleton Slots with 6 Reflectors

Gain 14 DB over a Dipole. Horizontal Beam width 70°. Feed Impedance 75 Ohms.

Supplied with provision for fixing to masts from 1¼"-2½". Price, less Mast ... **£7 10 0**

Low loss semi air-spaced co-axial cable to fit feed junction boxes on these arrays. Price, per yard **1 3**

2 STACK wavelength spaced Skeleton Slots with 4 Reflectors

Gain 12 DB over a Dipole. Horizontal Beam width 70°. Feed Impedance 75 Ohms.

Supplied with provision for fixing to masts from 1¼"-2½". Price, less mast ... **£5 10 0**

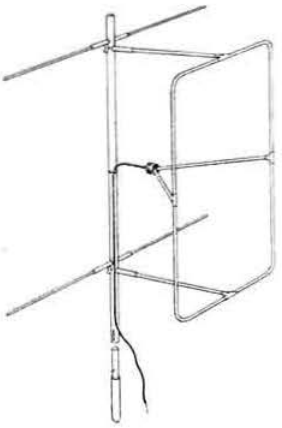
SINGLE SLOT Portable Antenna with 2 Reflectors

Gain 8 DB over a Dipole. Horizontal Beam width 70°. Feed Impedance 75 Ohms.

Designed for quick assembly, together with the necessary strength for fixed station use.

Supplied complete with 5' x 1¼" Mast. Price ... **£3 10 0**

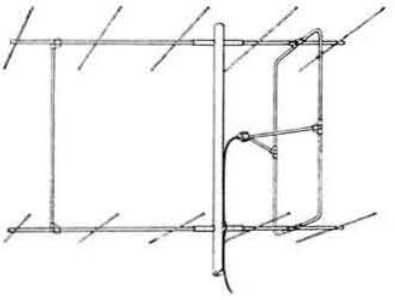
Socketed 5' Mast Sections to fit above. Price ... **15 0**



6 OVER 6 Slot Beam

Gain 13 DB over a Dipole. Horizontal Beam width 20°. Feed Impedance 75 Ohms.

Supplied complete with 7' x 1½" Mast. Price ... **£7 0 0**

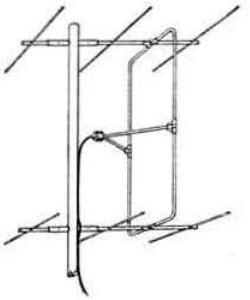


4 OVER 4 Slot Beam

Gain 11 DB over a Dipole. Horizontal Beam width 25°. Feed Impedance 75 Ohms.

Supplied complete with 7' x 1½" Mast. Price ... **£6 0 0**

Dural Mast Sections available:
14' lengths, 2½" O/D x 2" I/D. Price **£2 7 6**
7' lengths, 2" O/D x 1¼" I/D Price **£1 2 6**



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Cash with order to :

COMMUNICATIONS DIVISION

J-Beam Aerials

—LIMITED—

CLEVELAND WORKS

WEEDON ROAD INDUSTRIAL ESTATE

NORTHAMPTON **Telephone 1791**

★ **You must not fail to visit our stand at the 9th Amateur Radio Exhibition, Royal Hotel, Woburn Place, London, W.C.1, from November 23rd to November 26th, 1955.**

The illustrated arrays along with other amateur equipment will be on view for your inspection, etc.

Your enquiries will be welcomed and fully dealt with.

In addition to their standard 5/- and 6d. Ersin Multicore Solder Cartons, this company will be showing a new 2s. 6d. solder pack which contains approximately 20ft of 18 s.w.g. high quality alloy wound on a reel.

The Bib products include the Wire Stripper and Cutter, an ideal tool for home constructors, retailing at 3s. 6d. each, the Bib Recording Tape Splicer at 18s. 6d. each and a new Bib Gift Pack which contains a Screwdriver, Tape Solder and Bib Wire Stripper at 5/-.

PANDA RADIO COMPANY LTD.,

58 School Lane, Rochdale, Lancs.

THE Panda Radio Company is exhibiting the latest PR-120-V and "Cub" self-contained transmitters which require nothing more than the addition of a power plug, key or microphone and aerial. The PR-120-V, already established as a firm favourite throughout the world, is only rivalled in its popularity by the "Cub" which offers coverage of all amateur bands from 1.8 to 28 Mc/s inclusive, using either anode and screen modulated telephony or c.w.

Also on show will be the new "Globe Master" rotary beam, which has a tubular alloy boom, rugged alloy castings and special close fitting telescopic elements; the new Aerial Tuning Unit, which has optional "Top Band" coverage, and a comprehensive range of ancillary equipment.

P.C.A. RADIO

Beavor Lane, Hammersmith, London, W.6.

IN response to many requests, the makers of the 2 metre "Hamobile" transceiver, which has had a very successful season, are making it available in kit form.

Kit A consists of the chassis, front panel, all components (less valves), wiring diagram and instruction booklet. Kit B comprises Kit A and parts for the 12 volt d.c. supply unit. Kit C contains everything necessary to build an a.c. mains supply unit apart from the valves.

The loudspeaker, microphone set, valves and metal cabinets are available as separate items.

E. J. PHILPOTT'S METALWORKS, LTD.,

Chapman Street, Loughborough.

ITEMS displayed this year are largely the well-tried designs and finishes shown previously. In view of the miniature technique now common, attention is being given to smaller portable cases, which should be particularly useful for test gear.

Cabinets and chassis for popular BULLETIN equipment including the Britannia receiver, Band III converter, R.S.G.B. Two Metre Converter and the Elizabethan transmitter are on show.

Representatives are present on the Stand, and look forward to receiving suggestions from visiting radio amateurs to enable the firm to keep abreast of current needs.

RADIO SOCIETY OF GREAT BRITAIN,

New Ruskin House, Little Russell Street, London, W.C.1

Headquarters' Stand

THE 1956 Edition of the *R.S.G.B. Amateur Radio Call Book*, the most accurate directory of British Amateur Radio stations ever published, is on sale together with a wide selection of R.S.G.B. publications. The Sixth

The finest in their class!

Both these models are completely self-contained and need only a power plug and microphone or key to go straight on the air.

SEE THEM BOTH ON STAND 10

PANDA CUB £65

PR-120-V £150

All Panda equipment is designed and built by skilled engineers of long standing and only the best is good enough.

Send for full details now — both models available on H.P.

PANDA RADIO CO. LTD.

58 School Lane, Rochdale · Tel.: 47623 · Cables: 'Panda Rochdale'

If you are building

the R.S.G.B. *Britannia*

Communications Receiver

you will want these

BRIMAR VALVES

as specified in this issue

6BJ6 (2)	**12AH8**
6AL5 (2)	**6BW6**
6AM6 (3)	**12AT7**
6BA6	**5V4G**

VR 150/30

BRIMAR *chosen for*

Reliability and Long Service

See us at stand 26

Standard Telephones and Cables Limited

FOOTSCRAY, SIDCUP, KENT.

Telephone: FOOtscray 3333.

Edition of *A Guide to Amateur Radio* provides up-to-date information for the newcomer on all aspects of the hobby, including details of the Radio Amateurs' Examination and How to obtain a Licence.

Copies of the R.S.G.B. BULLETIN, now in its 31st year of continuous monthly publication, are available at specially reduced prices, as are certain technical booklets in the *Amateur Radio* series.

Members' notepaper, car plaques, badges and pennants are on sale.

American publications available from stock include the *Radio Amateur's Handbook*, the *A.R.R.L. Antenna Book*, the *Mobile Manual for Radio Amateurs*, the *Radio Amateur's Mobile Handbook*, *Single Sideband Techniques* and *Single Sideband for the Radio Amateur*. Orders can be accepted for *QST* and *CQ*, monthly journals of the American Radio Relay League and the Cowan Publishing Corporation respectively.

Modern amateur-built equipment loaned by members of the Society's Technical Committee and other well-known radio amateurs is a feature of the stand.

* * *

Amateur Constructors' Stands

EXHIBITS of interest to every visitor, whatever his own particular sphere of activity in Amateur Radio, are to be found on the stands devoted to home-built equipment. The latest techniques for 144, 420 and 1250 Mc/s will be seen on the V.H.F./U.H.F. stand while single sideband operators will find the best in contemporary practice on the S.S.B. stand. Transmitters and receivers of every type are shown on the H.F. Equipment stand together with mobile and portable gear, test and ancillary equipment.

On the Amateur Television stand the accent this year is on simple equipment including a flying spot scanner ideal for the beginner.

GB3RS, the Exhibition Station, can be seen in operation on Top Band and 3.5 Mc/s. A station will also operate on 144 Mc/s (2 metres).

SHORT WAVE MAGAZINE LTD.,

55 Victoria Street, London, S.W.1.

ESTABLISHED in 1937, *Short Wave Magazine* is "For the Radio Amateur and Amateur Radio." It has always maintained an independent policy and its editorial coverage embraces the whole field of radio amateur interests. The *Magazine* now circulates in more than 50 countries.

As in previous years, the stand space will be devoted partly to the wide range of radio books and publications now handled by Short Wave Magazine, Ltd., and partly to the prototypes of some of the apparatus described in recent constructional articles. At present, considerable attention is being paid to the "Beginner" interest. Books and subscriptions will be on sale.

STANDARD TELEPHONES & CABLES LTD.,

Brimar Valve Division

Footscray, Sidcup, Kent.

BRIMAR are exhibiting a good selection of their current range of receiver valves, metal rectifiers, germanium diodes, and the well-known Brimistors. Also on show are the 21in., 17in. and 14in. flat faced rectangular cathode ray tubes. Of special interest to the transmitting amateur is a display of low-power transmitting valves; transistors are included in working exhibits. A small range of transistors (for which literature is available) is included in the exhibit.

An Introduction to Amateur Transmitting

Part 9—Other Systems of Modulation

By LORIN KNIGHT, A.M.I.E.E.*

LAST month we considered anode modulation as a method of producing an amplitude modulated telephony transmission and found that with this method a large amount of audio frequency power was necessary. However, there are a number of alternative methods which require less a.f. power.

It is possible, for example, to control the output of the final r.f. valve by varying the voltage on one of its grids. Thus the a.f. voltage might be superimposed on the fixed bias voltage applied to the control grid or the suppressor grid. Alternatively the a.f. voltage might be superimposed on the h.t. voltage to the screen grid.

Screen Modulation

When using a tetrode as the r.f. valve, very good results can usually be obtained by the latter method and a typical circuit is shown in Fig. 34. V4 is the final r.f. valve and V1, V2 and V3 comprise the modulator.

The value of R13 would be chosen so that the screen of V4 was at about half the maximum h.t. voltage recommended for c.w. operation. With 100 per cent modulation, the screen would then swing between the maximum voltage and zero. With most tetrodes the relationship between the screen current and screen voltage is usually far from linear so that the effective resistance of the screen depends on the voltage applied to it. This means that the effective load on the modulator varies throughout the audio frequency cycle and that, unless some care is taken, considerable distortion can result. It is therefore a common practice to use some negative feedback in the last stage of the modulator to make it more tolerant of deviations in the load resistance. In the circuit shown, this feedback is achieved by adding the resistor R11.

Because of the fact that the load resistance does not have a constant value, a little experimenting may be necessary in order to find the best turns ratio for the modulation transformer. It is also difficult to predict exactly what a.f. power will be required, but as a rough approximation, this can be assumed to be one-quarter of the d.c. input power to the screen with the latter at its maximum voltage and the valve operating under c.w. conditions.

Where there is a clamp valve connected to the screen of the p.a. valve in order to protect the latter in the absence of any r.f. drive, the clamp valve can be used to modulate the screen voltage, but this system needs some careful adjustment if good results are to be obtained.

When using screen modulation (or grid or suppressor modulation), the p.a. stage is only working at maximum efficiency on the positive peaks of modulation. Its average efficiency is therefore less than with an anode modulated class C stage, which would be operating at maximum efficiency all the time.

The average efficiency can be improved by using a controlled carrier system. Such an arrangement would incorporate special circuits to reduce the h.t. current of the p.a. valve (and thus the strength of the carrier) during periods of low modulation intensity. But the fluctuations of carrier level which such systems produce can be a little disconcerting, and sometimes distinctly unpleasant, to the listener.

*C/o Laboratory for Electronics Inc., 75 Pitts Street, Boston 14, Mass., U.S.A.

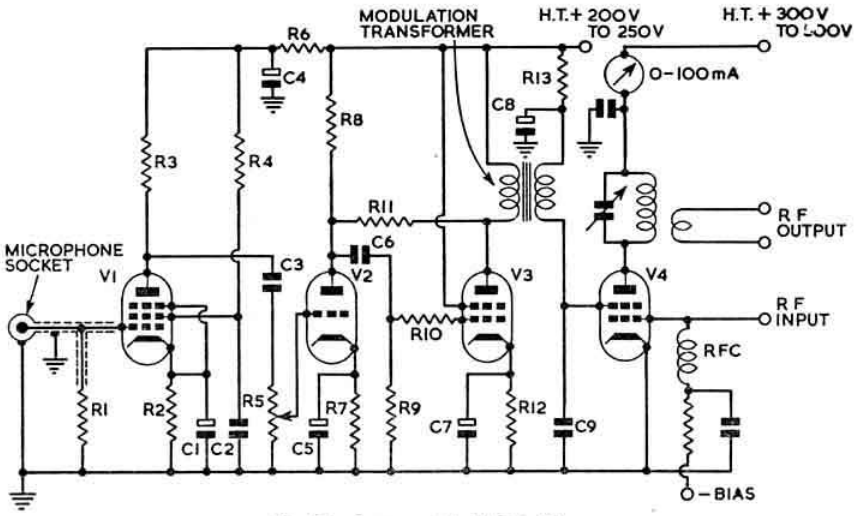

Fig. 34. Screen-modulated P.A. Stage

Typical values of the components are as follows:—
C1, C5, C7, 10μF 50V
C3, C6, 0.01μF 500V
C4, C8, 8μF 350V
C9, 0.001μF 500V
R1, 1 Megohm
R2, 1,000 ohms
R3, R9, 100,000 ohms
R4, 470,000 ohms
R5, 250,000 ohms volume control
R6, 10,000 ohms
R7, 1,500 ohms
R8, 150,000 ohms
R10, 22,000 ohms
R11, 330,000 ohms
R12, 270 ohms, 1 watt
R13, 5,000 to 50,000 ohms
V1, 6AM6, EF91, etc.
V2, One section of 12AU7, ECC82, etc.
V3, 6AQ5, EL90, 6V6, etc.
V4, 807

The optimum values for R13 and for the turns ratio of the modulation transformer are best found by experiment.

Other Methods of Amplitude Modulation

A number of other interesting forms of amplitude modulation have been devised. There is, for example, cathode modulation, in which the a.f. voltage is applied to the cathode of the p.a. valve. This system amounts to a combination of grid and anode modulation and has characteristics somewhere between the two. There are also some rather complex high efficiency grid modulation systems in which the r.f. valve is always operated at maximum efficiency, its d.c. power consumption increasing to supply the extra r.f. power when modulation is applied.

Yet another system, popular in broadcast transmitters but little used by amateurs, is to modulate a low power r.f. stage and then use the p.a. to amplify the modulated signal. When using this arrangement, it is essential that the output of the p.a. should be proportional to its r.f. input so that variations in magnitude of the r.f. input are faithfully reproduced in the output. This means that the p.a. stage cannot operate in class C and it is therefore usual in such circumstances to use what is known as a linear class B stage. This gives a lower efficiency than a class C stage.

It is important to remember that with any system which uses a low power modulator, all the r.f. power must be derived from the d.c. input power to that stage and that, since that stage cannot be 100 per cent efficient, the output power must be less than the d.c. input power. With anode modulation, on the other hand, a considerable proportion of the r.f. power is derived from the a.f. output of the speech amplifier and, under conditions of 100 per cent modulation, the r.f. output power can actually exceed the d.c. input power to the p.a. stage.

Thus, although often less efficient when the total input power to the whole transmitter is concerned, anode modulation does provide the greatest possible r.f. output for a given input, as the latter is specified by the transmitting licence, i.e. for a given d.c. input power to the anode of the final r.f. stage. Anode modulation also has the advantage that it requires a minimum of initial adjustment for good results to be obtained. If economy of equipment is the most important consideration, however, there is much to be said for grid or screen modulation.

Single Sideband

We saw earlier in the series that amplitude modulation of a signal causes signals to be transmitted on sideband frequencies which are arrayed on either side of the carrier frequency. If we analyze the way in which the r.f. power is distributed we find that most of it is concentrated in the carrier signal and that only a fraction of it is accounted for by the sidebands.

Now since the carrier frequency is fixed and by itself carries no intelligence, we can suppress it at the transmitter and let it be reinserted from a local oscillator at the receiver. The amplitude of the sidebands can then be several times greater for the same total r.f. power and the effective signal strength at the receiver correspondingly greater. We can go even further. Since the two sets of sideband frequencies are equal in amplitude and symmetrical about the carrier, only one set is really necessary. We can, therefore, suppress one and double the power in the other, thus halving the bandwidth occupied by the signal. The output from a transmitter possessing all these refinements is said to be a single sideband (s.s.b.) suppressed carrier transmission. In spite of the fact that such a transmitter is quite complex to build and adjust, many amateurs are now becoming very enthusiastic about s.s.b. suppressed carrier operation because of the great advantage it gives in the effective signal strength at the receiver.

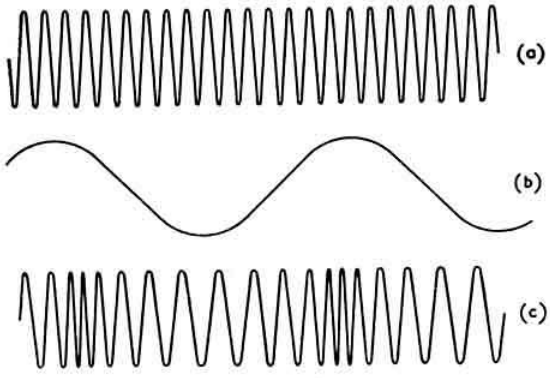

Fig. 35. Frequency Modulation. (a) Unmodulated r.f. signal. (b) A.f. waveform. (c) Modulated r.f. signals.

The usual technique in an s.s.b. transmitter is to produce the s.s.b. signal at a low power level and then to amplify it with a linear class B p.a. stage. The latter will have somewhat less efficiency than a class C amplifier, but the output will still be effectively far greater than could be obtained with a normal anode modulated class C stage using the same output valve and the same d.c. input power.

Frequency Modulation

Quite a different way of conveying intelligence is not to modulate the amplitude of the signal, but to modulate its frequency; an exaggerated representation of frequency modulation (f.m.) is shown in Fig. 35. It will be seen that when a modulating voltage is applied, the carrier frequency is increased during one half-cycle of the modulating waveform and reduced during the other. The change in carrier frequency (the frequency deviation as it is usually called) is, in fact, made proportional to the instantaneous amplitude of the modulating signal. Thus the deviation is greatest on the peaks of the modulating waveform.

In Amateur Radio the frequency deviation must be restricted to less than $2\frac{1}{2}$ kc/s so that the bandwidth occupied by the signal is comparable with that of a normal amplitude-modulated transmission. Such a transmission is usually referred to as narrow-band f.m. or simply n.b.f.m.

The effectiveness of an n.b.f.m. transmission depends largely on the receiver. A receiver specially designed for f.m. reception will to a large extent suppress any interference from a.m. transmissions and any noise which may be picked up. Unfortunately, most communications receivers are specifically built for a.m. reception. They can be made to respond to an f.m. transmission by a suitable amount of detuning which translates changes in frequency to changes in amplitude due to the selectivity of the i.f. amplifier. However, the f.m. signal is not used to its full advantage and may find it very difficult to compete with a.m. signals of the same strength.

Frequency modulation is usually achieved by what is known as a reactance valve connected to the tuned circuit of the v.f.o. This valve supplies a current which is out of phase with the applied voltage and thus behaves as a reactance, usually a capacitance. The value of this out-of-phase current, and thus of the capacitance, depends on the gain of the valve and can be changed by varying the grid bias voltage. Thus if an a.f. voltage is applied to the grid of the reactance valve, the reactance will deviate about its mean value in sympathy with the a.f. waveform, and so will the oscillator frequency. It should be noted, however, that the reactance value offers great possibilities for unwanted frequency drifts and a special effort must be made to ensure that the mean value of the reactance is stable.

Series concluded.

AN IDEAL CHRISTMAS GIFT IS AN
R.S.G.B. ALL SILK TIE
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Mobile Column

By JOHN A. ROUSE (G2AHL)*

MORE than 75 members and friends were present at the Mobile Rally at the Perch Inn, Binsey, Oxford, on October 9, the success of which far exceeded the wildest hopes of the organizers who had agreed beforehand that an attendance of a dozen or more would be most satisfactory! Incidentally the weather helped to make the affair particularly enjoyable.

Some of the early arrivals at the highly successful Mobile Rally held at the Perch Inn, Binsey, Oxford, on October 9, 1955.

(Photo by G2LW)

No formal programme was arranged and as a result the proceedings consisted of a mammoth "ragchew" which continued for several hours. At a conservative estimate, more than a million words must have been spoken on the subject of mobile radio! Much time was spent, too, on examining equipment and seeing how other people are tackling the problems involved. Particular attention was paid to aerial systems, ranging from 12ft centre-loaded whips of formidable appearance to 4-element rotatable Yagis for 2 m.

The neat rigs used by G2HCG, G3XC, G5KW and G6AG aroused much interest. The latter's 2 m equipment comprises an EF91 crystal oscillator followed by a 6F17, 5763 and QQV03/20 at 25 watts input. Modulation is provided by a crystal microphone, 12AX7, 12AU7 and push-pull 6BW6s. The receiver, which uses a 6AM4 r.f. stage, is a double conversion superhet. Power is derived from a rotary converter giving 300 volts at 200 mA consumption from the 12 volt battery being 6 amps for the receiver plus transmitter heaters, and 12 amps when sending. This equipment will be shown in operation at the R.S.G.B. Amateur Radio Exhibition.

G3WW's New Zealand ZC1 mounted in the boot of his car but remotely controlled from the driving seat provided an excellent example of the adaptation of a popular ex-Government unit.

Another transmitter for the h.f. bands which was closely examined was W3WAM's home-built "Viking Mobile" covering all bands from 3.5 to 28 Mc/s. This transmitter is one of the most popular used by mobile operators in U.S.A. and is supplied in kit form. The r.f. line-up is a 6BH6 crystal oscillator, 6AQ5 buffer/frequency multiplier and 807 p.a. Modulation is provided by a 6BH6 speech amplifier, 6BH6 driver and two 807s as class AB1 modulators. Audio response is restricted to the band 250-3000 c/s. Another interesting feature is the r.f. type bias supply for the modulator, p.a. and frequency multiplier valves. One half of a 12AU7 is used as an oscillator operating at around 4.5 Mc/s, the other section acting as a half-wave rectifier. All tuning controls are ganged.

The "Viking Mobile," which requires an h.t. supply ranging from 300 to 600 volts for inputs of 30 to 60 watts, is contained in a cabinet measuring 6½in. high by 7in. wide by 10½in. deep.

Another useful American device demonstrated by W3WAM was the "twin noise squelcher," a highly effective noise silencer especially useful for mobile reception. When the device is carefully adjusted no sound comes from the receiver until a station is tuned in, then the audio comes through unimpaired, yet even weak signals can be heard. The circuit of the squelcher has been described in *CQ Magazine* and the *Radio Amateur's Mobile Handbook*. Permission has now been obtained from the Editor of *CQ* to reproduce the circuit and other relevant information in the BULLETIN. (This will be done shortly.—Ed.).

Perhaps one of the greatest pleasures of the Rally — certainly for G2AHL — was the opportunity to meet so many mobile enthusiasts. Those who made themselves known to the stewards included B.R.S.16946, G2DU, 2LW, 2MM, 2UJ, 2VB, 2YV, 2AHL, 2AOK, 3WW, 3XC, 3ABG, 3COV, 3DBT, 3ERF, 3FWZ, 3FZB, 3FZL, 3GCS, 3GGJ, 3GJX, 3HCK, 3HYZ, 3IES, 3IEY, 3IIR, 3IPR, 3INL, 3ISZ, 3IVP, 3JKV, 3JLE, 3KKB, 3KLH, 3IUF, 4AP, 4IB, 4FO, 5CP, 5CV, 5KW, 6FO, 6AG,

G3GJX operating the Top Band Rally Station.

(Photo by G2LW)

**Assistant Editor, R.S.G.B. BULLETIN.*

6SN, 8DM, 8PX, W1WJN and W3WAM. G3HYZ/M arrived by river in his motor cruiser *Jonquil II* in which he has installed Top Band and 2 m mobile equipment.

The thanks of all who attended a most enjoyable event are expressed to G3GJX, who had the support and encouragement of G3GCS (Hon. Secretary), G3KLH, G8PX, Bernard Green and Tony Mitchell, all members of the Oxford and District Amateur Radio Society. The last named acted as steward on a tour of the colleges. Rally stations were operated by G3GJX (Top Band), G3GCS (3.5 Mc/s) and G8PX (144 Mc/s). An excellent buffet tea was provided by the staff of the Perch Inn. A raffle organized by G8PX was won by G2UJ.

The Rally was undoubtedly one of the most successful events of the Amateur Radio year and plans for a similar but more ambitious meeting in 1956 are already being discussed. It is hoped that it may become an annual gathering of mobile enthusiasts.

Identifying Mobiles

One of the points raised at the Mobile Rally concerned the identification of other mobile stations on the road. G3JKV, as reported some months ago, suggested that a small sign should be carried fore and aft showing the call-sign and band. However, the most satisfactory method still seems to be the adoption of mobile calling frequencies as was proposed last year. If this were done, a call could be put out whenever a likely-looking aerial was seen. The receiver would of course have to be left on the net frequency but the drain from the battery would be quite low. If a "twin noise squelcher" were fitted there would be no fatiguing background noise until a signal came up. On Top Band and 3.5 Mc/s it would be easy to arrange the "flick" mechanism on ZC1 equipment for the calling frequencies.

An extension of the calling frequency idea is that fixed stations interested in working mobiles could leave their receivers tuned to the channel while doing other jobs around the shack.

W3WAM, G3ABG, G3FZL and G3IWA look over some of the interesting equipment displayed at the Perch Inn, Binsey, during the Mobile Rally.

(Photo by B.R.S.16946)

At the moment, the need seems most urgent on Top Band, 3.5 and 144 Mc/s. Comments on these suggestions will be most welcome.

Five-way Mobile Contact

On September 29, a five-way 2 m contact between G2ATK, 3ABA, 5KW, 6AG and 8KW (who were all mobile in East and South East London) was maintained for nearly 3 hours. While most interesting as an example of the coverage obtained on 2 m, it should provide food for thought for members of R.A.E.N.

G3IES (London, N.W.3) is active using a modified ZC1 Mark II on Top Band and 3.5 Mc/s. He is experimenting with a ferrite cube loading coil for the 8ft whip aerial and would appreciate assistance from members who have tried similar forms of loading.

Australian Mobile Operation

VK3ZAM, who is at present in England, says that mobile operation is popular in Australia. In Melbourne, regular monthly meetings are attended by between 20 and 30 2 m operators. A popular feature of these meetings is the "fox hunt," a direction finding contest with a difference—the station to be found is actually moving! The "fox," as it is called, is given 10 minutes' start but must not travel at more than 15 m.p.h. The "hunters" are restricted to 30 m.p.h. by traffic regulations; anyone who is found to have exceeded this speed is automatically disqualified. Usually the "fox" is found within about half an hour, so two or three "hunts" generally take place at each meeting.

Two metres is the most popular band in Australia for mobile work because, unlike the lower frequencies, no special licence is required. In addition there are quite a lot of "technician" class licensees who are not allowed to use the lower frequencies but are interested in operating mobile. VK3ZAM's equipment is typical of that used and comprises a 12AT7 crystal oscillator and frequency multiplier, 12AT7 doubler and 5763 p.a. The receiver is a super-regen with 6AK5 r.f. stage and 6AK5 co-axial line detector. The common audio system is a 6AU6 feeding a 6M5. A close-spaced 3-element Yagi rotatable from within the car is mounted on the *front* bumper!

* * *

As mobile activity is expected to be somewhat reduced during the winter months, the next *Mobile Column* will appear in the February, 1956, issue of the R.S.G.B. BULLETIN. If anyone takes advantage of improved conditions to try mobile operation on 28 Mc/s full details would be appreciated. Please send all letters to arrive by January 15.

Society News

International Committee meets in Amsterdam

A FULL meeting of the Executive Committee of the International Amateur Radio Union, Region I Division, was held at the Schiller Hotel, Amsterdam on October 20 and 21, 1955.

The Chair was taken by Captain Per-Anders Kinnmann, SM2ZD (President of the Swedish Society, S.S.A.). Others present were Mr. Wyn Dalmyn, PA0DD (Vice-chairman), Mr. Arthur Milne, G2MI (Hon. Secretary), Mr. Harry Laett, HB9GA, Mr. R. H. Hammans, G2IG (President-elect, R.S.G.B.) and Mr. John Clarricoats (General Secretary, R.S.G.B. and Hon. Treasurer to the Committee).

The primary purpose of the meeting was to prepare an agenda for the I.A.R.U. Region I Conference which is to be held in Stresa, Italy, during June, 1956. Matters to be considered at that Conference will include:—

(a) I.A.R.U. Region I Division participation at the C.C.I.R. VIIIth Plenary Assembly in Warsaw, 1956.

(b) I.A.R.U. Region I Division participation at the next I.T.U. Radio Conference.

(c) An examination of the current licence position in each country within Region I and the relationship of each Society with its appropriate licence issuing authority.

The Conference will also discuss Amateur Radio emergency systems (such as R.A.E.N.), the occupancy of amateur bands and the European Band Plan.

Reports will be submitted on recent technical developments in Amateur Television and S.S.B. and on the steps taken to overcome TVI.

Whilst in Amsterdam the members of the International Committee were the guests of V.E.R.O.N. (the Netherlands National Society) at numerous functions held in celebration of the 10th anniversary of the formation of that Society.

Generous references to the work done by the International Committee were made by the President of V.E.R.O.N. (Mr. L. J. v. d. Toolen, PA0NP) when he welcomed the guests at the Anniversary Dinner. Among those present was Mr. Van der Toorn, Director-General of the Netherlands Posts & Telegraphs Department.

Each guest at the dinner was the recipient of an attractive certificate commemorating the Anniversary.

Captain Per-Anders Kinnman, SM2ZD, signs G6CL's autograph album during an interval at the meeting of the International Committee of I.A.R.U. Region I Division held in Amsterdam last month. Others in the picture, left to right, are: Harry Laett, HB9GA, Wyn Dalmyn, PA0DD, Arthur Milne, G2MI and Reg Hammans, G2IG.

No I.T.U. Radio Conference Next Year

AT the Tenth Annual Session of the Administrative Council of the International Telecommunication Union held in Geneva from April 23 to May 21, 1955, it was decided not to convene an I.T.U. Radio Conference during 1956. In reaching its decision the Council recognized that the usefulness of such a Conference depends to a great extent on the progress made in introducing order into the frequency spectrum on the basis of the decisions taken in Atlantic City during 1947.

At the Eleventh Session of the Council to be held during 1956 fresh thought will be given to the question as to whether a Radio Conference could usefully be convened for the following year. Similar thought will be given to the question of the next Plenipotentiary Conference which should normally meet in 1957.

Amateur Radio Exhibition

MEMBERS are reminded that the Ninth Annual R.S.G.B. Amateur Radio Exhibition will be opened at 12 noon on Wednesday, November 23, 1955, by Vice-Admiral J. W. S. Dorling, C.B., M.I.E.E. (Director, Radio Industry Council). The Exhibition will be held at the Royal Hotel, Woburn Place, London, W.C.1, from November 23 to November 26, and will be open daily from 11 a.m. until 9 a.m. Admission 1/-, payable at the door.

Members willing to undertake duty on the Headquarters stand are asked to get in touch immediately with the General Secretary.

DEPUTY GENERAL SECRETARY

The Radio Society of Great Britain invites applications for the post of DEPUTY GENERAL SECRETARY, preferably from men between the ages of 28 and 38 years. The post is permanent, progressive and pensionable and it is hoped that the successful applicant will make his career with the Society. The Council of the Society seek a man who will in due course qualify himself for the position of GENERAL SECRETARY. Candidates should possess a sound knowledge of general office administration. Experience of amateur or experimental radio work will be an additional qualification. The commencing salary for the post will be not less than £900 per annum and after a probationary period of service, increments will be in accordance with an agreed scale.

Applicants, who must be British, should submit references and give full details of their qualifications and previous experience. A copy of a recent photograph should also be furnished. All applications must reach the General Secretary, Radio Society of Great Britain, New Ruskin House, 28/30 Little Russell Street, London, W.C.1, by December 31, 1955, marked "Private and Confidential." Canvassing will be a disqualification.

Television News

B.B.C. Colour Television Transmissions

EXPERIMENTAL colour television tests using a British version of the N.T.S.C. (National Television System Committee) compatible system adopted in the U.S.A., were started by the B.B.C. at the beginning of October from its Alexandra Palace station. The transmissions have no entertainment value and are transmitted outside normal television hours. The colour reproduction is very good while the picture quality on black and white receivers appears to be unaffected.

The system is based upon the physiological fact that the sensation produced by most of the colours encountered in real life can be reproduced using only three colours. At the transmitting end the scene is analysed by optical filters in terms of the amount of red, green and blue light present. This information is transmitted to the receiver by the system described below, and the scene is reproduced by the combination of separate red, green and blue lights having corresponding characteristics to the analysing filters.

In the film scanner the source of light is a cathode ray tube, the separate red, green and blue information being turned into electrical signals by photo-electric tubes. The camera employs three separate image orthicon pick-up tubes from which the three electrical signals are obtained. In both cases the three colour separation signals are then manipulated electrically to produce a brightness signal and a colour information signal which conveys the sensation of hue and saturation. The brightness signal is transmitted exactly as in the case of black and white pictures and may be used to produce pictures on a black and white receiver. The colour information signal, which is of lower bandwidth than the brightness signal, is used to modulate a sub-carrier of 2.66 Mc/s in both amplitude and phase, the carrier itself being suppressed so that for those parts of the scene which contain no colour no signal other than brightness is transmitted. Thus, for those areas of the scene which are colourless, the signal is identical with that of the present black and white service. The brightness, or, to give it its technical name, luminance, signal, is combined with the colour, or chrominance signal, on a basis of frequency interleaving so that its presence produces the minimum disturbance on a black and white receiver. The whole signal is contained within the 3 Mc/s band used for present day black and white transmission.

At the colour receiver, the combined signal goes through a process which produces the three-colour information signals controlling the brightness of the three phosphors of the reproducing tube. In this system, advantage has been taken of the fact that the eye is unable to appreciate the presence of colour in small areas. The lower bandwidth of the chrominance signal, ranging from 0.3 to 1.0 Mc/s, which has enabled the whole signal to be contained in the normal bandwidth of 3 Mc/s, therefore causes little or no degradation of the reproduced picture, since luminance changes to which the eye is sensitive are reproduced faithfully.

B.B.C. Television Station at the Crystal Palace : Vestigial Sideband Characteristic

THE following statement was issued early last month by the B.B.C. :—

"It has been decided, after consultation with the G.P.O., the Radio Industry and the Trade, that the new B.B.C. television station at the Crystal Palace, which is to be opened early in 1956, will use the same method of transmission of the vision signals as is used at all the post-war B.B.C. television stations, the upper sideband being partially suppressed. In this respect, the new station will differ from the existing station at Alexandra Palace, which transmits both sidebands equally. The new station will use the same frequencies and polarisation as Alexandra Palace. The actual date when it will come into service will be announced as soon as practicable.

"The change to the vestigial sideband method of transmission will not affect reception on receivers of types now on sale, because they are all designed for it. In some older receivers a slight adjustment may be necessary to achieve the best results. In a few cases, some modification to the receiver may be advisable and there may be some slight loss of detail in the picture; owners of old receivers who have any difficulty should consult a competent radio dealer. The great majority of viewers will not need to make any change in their receivers or aerials, except possibly to re-orientate the latter."

Times of Transmissions from G9AED

BELLING & LEE LTD. have announced new times for the radiation of test signals from their experimental station G9AED which is at present operating from the Midlands I.T.A. site near Lichfield. From Mondays to Fridays the transmitter is on the air from 9.30 a.m. to 12.30 p.m., 2 p.m. to 5.30 p.m. and 7.30 p.m. to 8.30 p.m. On Saturdays the test signals are radiated from 10 a.m. to 1 p.m. (See "Letters to the Editor," page 242.—ED.)

The fine trophy, presented by Phil Thorogood (G4KD), which is to be awarded to the member exhibiting the most meritorious piece of equipment at the R.S.G.B. Amateur Radio Exhibition, 1955.

Regional Meetings

Belfast

NORTHERN Ireland members were joined by guests from Eire at the Region 15 O.R.M. held at the Wellington Park Hotel, Belfast, on October 1.

The Region 15 Representative, Mr. J. W. Douglas (GI3IWD) welcomed the guests who included the President (H. A. Bartlett, G5QA), Council Member and Past President W. A. Scarr, M.A. (G2WS), the General Secretary (John Clarricoats, O.B.E., G6CL), Alan Jackson, EI8L (Vice-President, I.R.T.S.), Capt. Andrew Woods, EI3L (Honorary Secretary, I.R.T.S.) and Harry Wilson, EI2W (Past President, International V.H.F. Society).

During the business meeting the General Secretary gave an informative talk on Society affairs and answered many questions.

Following the Dinner, Society films were shown and prizes distributed by the President. A collection was made on behalf of the Wireless for the Blind Fund.

The success of the event can be measured by the general regret expressed that such occasions do not occur more often. The presence of amateurs from Eire was welcome evidence of the true Ham Spirit prevailing at the meeting.

Glasgow

COUNCIL was represented by Frank Hicks-Arnold (G6MB) and the General Secretary (John Clarricoats, O.B.E., G6CL) at the Region 14 O.R.M. held in the Christian Institute, Bothwell Street, Glasgow, on Saturday, October 15. The President (H. A. Bartlett, G5QA) was unfortunately unable to be present.

After a talk in which he dealt with matters of importance to the membership and stressed the need for active support of R.A.E.N., the General Secretary answered many questions of topical interest. Mr. Hicks-Arnold followed with an illustrated lecture on "The Antenna-match."

The dinner in the evening at Sloan's, Argyle Crescent, was attended by 105 members. One of the highlights was a presentation to the General Secretary by Mr. A. McQueen (GM4PW).

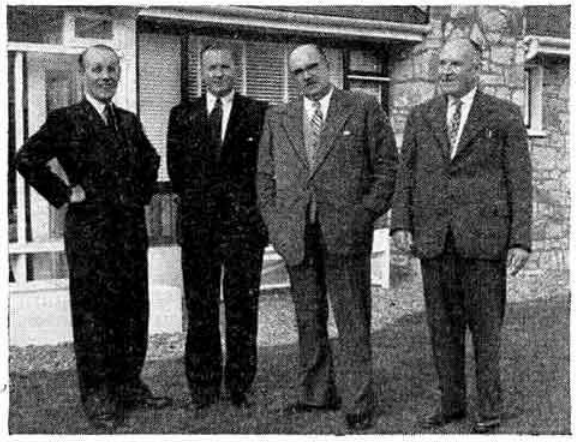
The Scottish N.F.D. trophy was presented to Mr. James Sey (GM8MJ). Mr. Hicks-Arnold later accepted, on behalf of the Council, the Maitland Trophy presented to the Society by Mr. James Maitland (B.R.S. 19625) as a Scottish award in connection with the R.S.G.B. Top Band contests. —GM6MD.

Teddy Maxwell (GI3ML), Bill Douglas (GI3IWD), Bertie Martin (GI5HV) and Bob Barr (GI5UR), admire the gold badge worn by Mayors of the Borough of Southgate. Harry Wilson (EI2W) took this picture during the General Secretary's recent visit to the home of GI5HV at Greenisland, Co. Antrim, N. Ireland.

Edinburgh

THERE was an attendance of about 60 at the Region 13 O.R.M. held at the Scotia Hotel, Edinburgh, on Sunday, October 16. Headquarters was represented by Council Member Frank Hicks-Arnold (G6MB) and the General Secretary. Mr. David Macadie (Region 14 Representative) and a number of other members from that Region were also present.

The General Secretary addressed the meeting on a variety of matters of topical interest, including the News Bulletin Service, and a useful discussion followed. During the meeting the R.R. (Mr. Ken Senior, GM3AEI) intimated that for personal reasons he would not be able to continue in office after the end of the current year. A high tea followed the meeting.



During his recent visit to Southern Ireland the General Secretary took the opportunity of calling at the home of Harry Wilson (EI2W) at Foxrock, Co. Dublin. In this picture Phil Thorogood (G4KD) (President, International V.H.F. Society) is on the left and Bertie Martin (GI5HV), on the right. EI2W and G6CL fill the centre positions.

London Meeting

THE attendance at the meeting of the Society held at the Institution of Electrical Engineers, London, W.C.2, on October 28, 1955, was much below expectation.

Mr. Arthur Milne, G2MI (Immediate Past President), read to the meeting a paper written by Mr. Roth Jones, VK3BG, of Victoria, Australia, entitled "Amateur Radio in the Antarctic." The lecture was followed by a screening of the colour film "Blue Ice" loaned by Australia House.

A recording of the paper made by Mr. Jones will shortly become available from the R.S.G.B. Recorded Lecture Library.

A vote of thanks to Mr. Jones for preparing, and to Mr. Milne for reading, the paper was proposed by Dr. Arthur Gee, G2UK.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street. Tottenham Court Road,

at 12.30 p.m. on Fridays, November 18 and December 16, 1955.

Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, September 13, 1955, at 6 p.m.

Present.—The President (Mr. H. A. Bartlett in the Chair), Messrs. W. H. Allen, L. Cooper, D. A. Findlay, R. H. Hammans, J. H. Hum, F. Hicks-Arnold, W. H. Matthews, W. R. Metcalfe, A. O. Milne, H. W. Mitchell, L. E. Newnham, W. A. Scarr and John Clarricoats (General Secretary).

Apologies for Absence

Apologies for absence were submitted on behalf of Messrs. C. H. L. Edwards and R. G. Lane.

* * *

Membership

(a) *Resolved* (i) to elect 59 Corporate Members and 15 Associates, (ii) to grant Corporate Membership to 4 Associates who had applied for transfer, (iii) to grant Life Membership to Mr. F. J. Trollope (B.R.S. 4190).

(b) The Secretary reported that of the 704 members whose subscription became due on June 1, 1955, 146 became overdue on August 31, 1955. Of this number 29 were London, 94 were Country and 18 were Overseas Corporate Members and 5 were Associates. Of those overdue, 16 London, 46 Country and 14 Overseas members held callsigns.

The Secretary submitted details of the 8 members (including 1 Associate) who had written to resign during the 4 weeks ended September 10, 1955. Of this number 3 had resigned on financial grounds, 4 gave no reason, and 1 stated he had lost interest.

Radio Show, Earls Court

It was reported that a total of £290 0s. 9d. was taken on the Society's stand at Earls Court, compared with £436 3s. 9d. in 1954.

Amateur Radio Exhibition

An up-to-date report on the position with respect to the letting of space at the 1955 Amateur Radio Exhibition was presented.

Society Trophies

Awards of Society Trophies were approved in accordance with the list published in the Society's Journal.

Arising from a discussion on the award of Society trophies it was *Resolved* that (a) in future years the Society's Regional Representatives and the Society's specialist contributors to the BULLETIN shall be written to as soon as possible after June 30 and asked for their views in regard to the award of the Society's premier trophies, (b) the matter shall be given preliminary consideration by the Council at its meeting in August and finally resolved at its meeting in September each year.

Council Vacancy

The Council decided not to fill the vacancy created by the resignation of Mr. R. L. Varney as it is now so late in the year.

Organized Lectures

Resolved to authorize the Representatives for Regions 9 and 12 to contact Mr. Hicks-Arnold with a view to arranging lectures in Bristol and Aberdeen respectively.

European Two Metre Contest

The Secretary reported upon correspondence received from two Members regarding the recently-held European Two Metre Contest. The members concerned had complained that the summary of the Rules published in the August BULLETIN was misleading in certain respects. The Secretary explained that the Rules were not received from the organizing Society (Austria) until just before the August issue closed for press. A summary was prepared at short notice. After the August issue appeared further copies of the Rules were received. Most of these were taken down to Earls Court and displayed on the R.S.G.B. Stand. The balance were distributed at the September meeting of the London U.H.F. Group.

The Secretary read to the meeting extracts from the September issue of *The Short Wave Magazine* in which the v.h.f. contributor criticised the I.A.R.U. Region I Committee for not making better arrangements regarding the organization of the Contest. Mr. Milne explained that the organization of European Two Metre Contests is left to the individual society concerned. He would, however, bring the present complaints to the notice of the I.A.R.U. Region I International Committee when it meets in Amsterdam.

Cash Account

Resolved to accept and adopt the Cash Account for August as prepared by the General Secretary.

Reports of Committees

The Minutes of Meetings of the Contests and Exhibition (Home Constructors' Section) Committees held on August 18, 1955, and September 9, 1955, respectively, were submitted as Reports.

Resolved to accept the Reports.

The Minutes of a Meeting of the Finance and Staff Committee held on September 6, 1955, were submitted as a Report.

Resolved to accept the Report and the Recommendations contained therein.

The Recommendations dealt with (a) a proposal to invest the sum of £1,500 in 3½% Conversion Loan, 1969, (b) a proposal to grant an immediate increase of 10% in the salary of each member of the staff in order to meet recent increases in the cost of living and travelling, (c) a proposal to extend the Staff Pensions scheme to another member of the staff, (d) a proposal to appoint a Deputy General Secretary, (e) a proposal to purchase two recording machines in order to facilitate the work of Headquarters.

R.A.E.N.

A Member of the Council expressed the opinion that more publicity should be given in the BULLETIN to the work of the R.A.E.N. The Secretary explained that Mr. Fenton had agreed to contribute approximately 1,000 words every other month. This arrangement appeared to meet the wishes of the Committee but it could be varied whenever additional material of general interest became available.

The meeting terminated at 9.5 p.m.

Radio Amateurs' Examination

CONSEQUENT upon changes recently introduced by H.M. Postmaster-General in the conditions for the award of transmitting licences, it has become necessary to make modifications to the preamble and to Section 10 of the syllabus for the Radio Amateurs' Examination.

Paragraph 1 of the preamble should accordingly now be deleted and the following inserted in its place:—

"The Radio Amateurs' Examination is designed to meet the needs of candidates in Great Britain and Northern Ireland who intend to apply to the Postmaster-General for the issue of a Radio Amateur Certificate, an Amateur (Sound) Licence, or an Amateur Television Licence. Success in the examination will be accepted by the Postmaster-General as evidence of the candidate's possessing the requisite theoretical technical knowledge, but, before a Radio Amateur Certificate, or an Amateur (Sound) Licence is issued, the candidate will, in addition, be required to pass a Morse Test to be conducted by the General Post Office. A Morse Test is *not* required for an Amateur Television Licence. Exemption from the Radio Amateurs' Examination and from the Morse Test for the Amateur (Sound) Licence is allowed in certain conditions, but no exemption is allowed in respect of the Radio Amateur Certificate. (See *How to Become a Radio Amateur*, Radio and Accommodation Dept., G.P.O. Headquarters, London, E.C.1)."

Paragraphs 2, 3 and 4 of the preamble remain unaltered.

Section 10 of the Syllabus should be amended to read:—

"Conditions laid down by H.M. Postmaster-General for the Amateur (Sound) Licence, covering the purpose for which the transmitters may be used; types of signals permissible; types of emission; power, frequency control and measurements; avoidance of interference to other stations; qualifications of operators; log-keeping; use of call-signs."

* * *

RESULTS issued by the City and Guilds of London Institute show that 372 candidates passed the Radio Amateurs' Examination held in May, 1955. Compared with previous years the number of candidates, passes and failures were as follows:

Candidates	1955	1954	1953
Home Total	428 — 100%	395 — 100%	477 — 100%
Passes	369 — 86.2%	327 — 82.8%	388 — 81.4%
Failures	59 — 13.8%	68 — 17.2%	89 — 18.6%
Overseas Total	8 — 100%	13 — 100%	9 — 100%
Passes	3 — 37.5%	7 — 53.8%	8 — 88.9%
Failures	5 — 62.5%	6 — 46.2%	1 — 11.1%

As may be seen, the number of home candidates was higher than in the previous year, while the general standard of work was good. The examination paper was as follows:—

EIGHT *questions in all are to be attempted, as under:*
ALL FOUR *in Part* 1 *(which carry higher marks) and* FOUR *others from Part* 2.

PART 1

1. State the conditions laid down by H.M. Postmaster-General in respect of the licensing requirements for :—
   (*a*) Frequency control and measurement,
   (*b*) Non-interference,
   (*c*) Receiver. (15 *marks.*)

2. Compare the advantages and disadvantages of absorption and heterodyne frequency meters and state under what conditions each type is used. (15 *marks.*)

3. State what precautions should be taken in a radio transmitter to avoid:—
   (*a*) Harmonics,
   (*b*) Spurious oscillations,
   (*c*) Key clicks and thumps. (15 *marks.*)

4. (*a*) Describe, with the aid of a diagram, the circuit of a full-wave rectifier, with smoothing, to provide the high tension d.c. supply for a transmitter.
   (*b*) Show how the output voltage is affected by the insertion of a smoothing circuit. (15 *marks.*)

PART 2

5. Explain the meaning of:—
   (*a*) self inductance,
   (*b*) mutual inductance.
   Define the unit of inductance. (10 *marks.*)

6. Give the circuit diagram and state the functions of the stages of a three-valve tuned-radio-frequency receiver suitable for telephony reception on the lower frequency amateur bands. (10 *marks.*)

7. If the effective series inductance and capacitance of an aerial is 10 microhenrys and 100 picafarads respectively and an inductor of 30 microhenrys is connected in series with the aerial, what is the resonant frequency ? (10 *marks.*)

8. Explain the following terms in relation to alternating current:—
   (*a*) peak value,
   (*b*) effective (r.m.s.) value,
   (*c*) instantaneous value. (10 *marks.*)

9. Describe, with the aid of a diagram, tuned and untuned aerial feeders and state their relative advantages and disadvantages. (10 *marks.*)

10. Describe the construction of any receiving or transmitting multi-grid valve, stating the function of each electrode. (10 *marks.*)

Examiners' Comments. *Questions* 1, 4, 5, 6, 8 *and* 10 *were well done by practically all candidates. Questions* 2 *and* 3 *were fairly well answered by most candidates. Question* 7 *was generally well answered but a few candidates, although giving a correct numerical answer, omitted to place the decimal point correctly. Very few candidates attempted Question* 9 *and those who did only gave fair answers.*

Birmingham Aerial Convention

BELLING & LEE LTD. are arranging an Aerial Convention in Birmingham commencing at 2.30 p.m. on November 30, 1955. In addition to a popular technical talk on Band III aerials, problems associated with the reception of high frequency transmissions will be discussed. Aerials for v.h.f. (f.m.) broadcasting will also be considered. Further details may be obtained from N. D. Bryce, Belling & Lee Ltd., Great Cambridge Road, Enfield, Middlesex. The convention will be held in the Town Hall.

Radio Components Exhibition

ON April 9, 1956, there will be a preview of the Radio and Electronic Component Manufacturers' Annual Private Exhibition which is to be held at Grosvenor House, London, W.1, from April 10 to 12. The preview is an innovation. Application for admission to the exhibition must be made in advance to the Radio and Electronic Component Manufacturers' Federation, 21 Tothill Street, London, S.W.1.

National Radio Show, 1956

THE Twenty-third National Radio and Television Exhibition will be held at Earls Court, London, from August 22 to September 1, 1956. There will be a preview for overseas and other special guests on August 21.

British Institution of Radio Engineers

H. J. LEAK will lecture on "High Fidelity Loudspeakers—the Performance of Moving-coil and Electrostatic Transducers" at the meeting of the British Institution of Radio Engineers in the Lecture Theatre of the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1, on November 30, 1955.

Test Instruments Scheme.—Taylor Electrical Instruments Ltd. have introduced a part exchange system. Taylor instruments returned to the manufacturers are now being reconditioned and offered to radio amateurs and students at a low price and on a non-profit basis. Reconditioned equipment is offered for sale, as available, complete with instruction manuals and two months' written guarantee. Prices range from £3 15s. for a Signal Generator type 60 to £13 for an Oscilloscope type 30A. Full details may be obtained from the company at 419-424 Montrose Avenue, Slough, Bucks.

New Miniature Transformers. Partridge Transformers Ltd., Roebuck Road, Tolworth, Surrey, are now manufacturing miniature potted transformers which are available in five sizes. Two alternative constructions are being made: the first is hermetically sealed and oil or compound filled; the second embodied in synthetic resin (resin cast construction). Microphone transformers and high fidelity line transformers with primary impedances of 6.25 to 600 ohms and ratios from 80:1 to 20:1 are available from stock. The frequency characteristics of these transformers are flat ± 1 db from 20 to 20,000 c/s.

Plansel Universal Studs. Creators Ltd., Sheerwater, Surrey, are manufacturing a range of plastic mounting studs which will not scratch polished surfaces. They are oil, grease and water resistant, and are designed for use on radio and television equipment. The studs are available in packets of 100 in four diameters—$\frac{1}{2}$in., $\frac{5}{8}$in., $\frac{3}{4}$in. and 1in.—at 3/6, 4/6, 6/6 and 8/6 respectively.

Ronette Microphones. A well-illustrated catalogue giving details of the Ronette range of Dutch-made microphones may be obtained from Trianon Electric Ltd., 95 Cobbold Road, London, N.W.10.

Eddystone "820" Receiving Unit. An 8-valve tuning unit providing continuous tuning over Band II (f.m. broadcasting), two-spot frequencies in the medium and one in the long wave ranges, has been introduced by Stratton & Co. Ltd., Birmingham 31. High impedance output is provided to match into the grid of the average amplifier. An internal power supply is provided.

High Fidelity Pre-amplifier. H. J. Leak & Co. Ltd., Brunel Road, London, W.3, have introduced the Varislope Mark II pre-amplifier, a low noise, low distortion, two-stage feedback tone control unit in which the first stage provides record compensation by means of frequency selective negative feedback. A 9-position selector switch provides for inputs from microphones, tuner units, tape recorders, television sound receivers and 5 different disc recording characteristics.

New Valves. Mullard Ltd. has announced two new valves, the PCL82 noval-based triode pentode with separate cathodes for use in the frame time-base circuits of transformerless television receivers, and the EM81, a noval-based electron beam tube for use as a tuning indicator in f.m. or a.m. receivers or as a level indicator in tape recorders. The display pattern takes the form of a central dark area which diminishes on the application of negative bias to the control grid. The pattern is viewed through the side of the tube.

Representation 1956-57

A COMPLETE list of Corporate Members who have been nominated without opposition to serve as Regional or Town Representatives will appear in the December issue of the BULLETIN.

Ballots.

It will be necessary to conduct a Ballot for the election of Regional Representatives in Region 5 and 12 and for the election of an Aberdeen Town Representative.

The names of the nominees for the respective offices are set out below:—

Regional Representatives

Region 5.

Mr. T. A. T. Davies (G2ALL) of Cambridge.
Mr. C. L. Fenton (G3ABB) of Danbury, Essex.

Region 12.

Mr. L. Hardie (GM2FHH) of Aberdeen.
Mr. E. G. Ingram (GM6IZ) of Aberdeen.

Town Representative

Aberdeen.

Mr. G. Jamieson (GM3HTI).
Mr. W. A. Mitchell (GM3FRI).

Voting.

Corporate Members resident in the Regions concerned are invited to record their vote in favour of one of the above candidates and to forward same on a *postcard*, addressed to the General Secretary, Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, *to arrive not later than November 30, 1955.* A similar invitation applies in respect to Corporate Members resident in the city of Aberdeen who should vote for one of the two candidates for the office of T.R.

Prescribed Form of Voting Card.

Election of Representatives 1956/57

I ..... being a fully paid-up member of the Society wish to record my vote in favour of Mr. ..... as .....
Representative for .....
Signed .....
Call-sign or B.R.S. .....
Address .....
.....

Votes for Regional and Town Representatives must not be included in Council Ballot envelopes. Closing date for voting cards in connection with the election of Representatives is WEDNESDAY, NOVEMBER 30, 1955.

73 de II AOY

FRED, who until last month operated under the call II AOY, is leaving shortly for the U.S.A. He asks that his greetings be conveyed to his many friends in the U.K.

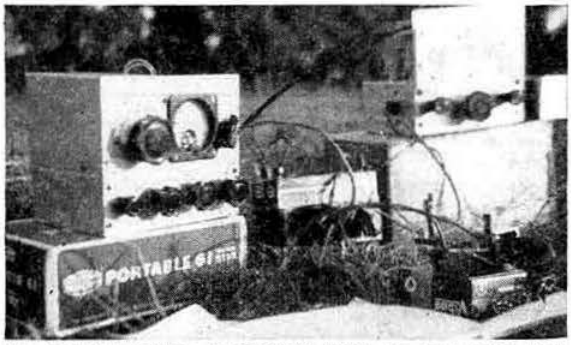
Tests and Contests

Low Power Field Day, 1955

ALTHOUGH the total number of entrants rose by only one over last year, it is surprising that three-quarters of those who took part in this year's Low Power Field Day did not compete in 1954. Very few portable stations known to be active did not submit entries. Some stations signing -/A were not working portable.

Once again there are no complaints about the weather, and, for the majority, this was the third year when weather, if not propagation, conditions were almost ideal.

At last, some, though very few, contacts were made on 7 Mc/s, but 3.5 Mc/s is still the main point-producing band. Opinion will never be unanimous, apparently, on whether 1.8 Mc/s should be substituted for 7 Mc/s in this contest. There are a few who regularly give their annual "Aye," but once more the majority say "Nay." The "Noes" are divided between those who believe that 7 Mc/s is bound to be useful soon and the others who are content to leave well alone. The point will, however, be considered again when framing the rules for 1956.

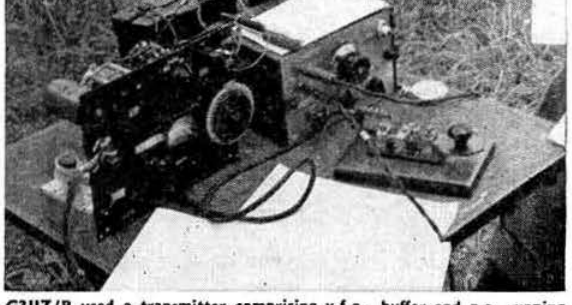


The operating position at G3CGD/P during the Low Power Field Day. A miniature bug key specially made for the event is in the right foreground.

John Yeend (G3CGD/P), with 80 points from 32 contacts, is back at the top, after being deposed last year. His transmitter comprised a 3S4 (as a triode) Hartley oscillator, 3S4 b.a., 3S4 p.a. and his receiver 1T4 r.f., 1T4 regenerative detector and 3S4 output. Second is L. W. Gardner (G5GR/P) with 34 contacts for 77 points, who used a transmitter employing an LP2 in a shunt-fed Colpitts circuit and a type 18 set receiver. In third place is T. J. Brooke (G3GHC/P), whose 22 contacts produced 54 points, using a transmitter consisting of a 3S4 e.c.o. and 3D6 p.a. The receiver, a superhet, was described in the report on the 1954 event which was won by G3GHC.

A few entrants experienced difficulties (it would not be a field day without) but probably GM3HNW had more than his share, as, with newly constructed gear he "didn't get really going until the last hour." The Contests Committee wish that others with very few contacts would submit their log as an entry, or, if they prefer, a check log.

In response to requests, the table of results this year shows the average "S" points given and received by each entrant. These figures are based on all contacts with fixed and portable stations—if the portables only are considered the average is, generally speaking, about half an "S" point lower.



G3JIZ/P used a transmitter comprising v.f.o., buffer and p.a. running 3½ watts during the Low Power Field Day. The four valve superhet receiver (right) was built by G3JKA. The aerial was a 132ft long wire.

Results of Low Power Field Day

Position	Call-sign	Locality	Weight of Gear lb.	oz.	Average 'S' Reports Out	In	Points
1	G3CGD/P	4 m. Cheltenham	16	9	6.3	5.5	80
2	G5GR/P	Finham, Coventry	18	0	6.4	6	77
3	G3GHC/P	Ranton, Staffs	18	12	6.6	6	54
4	G3JIZ/P	Paddock, Epsom	18	12	7	6.2	52
5	G8TS/P	Ewshot, Farnham	18	11	6.7	6.2	50
6	G8NN/P	Bradfield, Yorks	18	14	5	4.6	36
	G2YS/P	Driffield, Yorks	19	4	6.5	6.4	36
8	G3ISU/P	Ivinghoe, Herts	19	10	6.5	5.6	34
9	G8AO/P	South Shields	15	0	7.1	7	31
10	G3BZM/P	Hampdon, Bucks	19	0	7	5.6	30
11	G3IRB/P	Harefield, Middx.	18	8	7.1	6.1	25
	G3JKA/P	Dorking, Surrey	16	0	5.8	5	25
	G6AH/P	Ilford, Essex	16	0	5.7	5.3	25
14	GM3HNW/P	Markinch, Fife	16	0	5.5	5.5	6

Second Two Metre Field Day, 1955

L. J. KENNARD (G3ABA/P) of Coventry with 9,468 points was first in the Second Two Metre Field Day held on August 7. Northampton Short Wave Radio Club (G3GWB/P) took second place with 9,292 points. J. A. Ward (G4JJ/P) was third with 6,209 points.

Full results will appear in the December issue of the BULLETIN together with the usual report.

A.R.R.L. DX Contest, 1955

F. J. U. RITSON (G5RI) was again the leading English station in the Telegraphy Section of the A.R.R.L. DX Contest, with 89,712 points, a considerable improvement on his score of 60,840 in 1954. Other entrants were G2QT (31,096), G2BB (15,916), G3HJJ (7,264), and G3BLE (4,212). GI3JEX scored 990 points and GW5SL 30,384 points.

British entrants in the Telephony Section were S. R. Kharbanda (G2PU), winner of the English Telephony award for the ninth year in succession, with 9,774 points, G3DO with 5,831 points and G3HJJ with 432 points. The only Scottish competitor was GM3GCH who scored 180 points.

Alaskan DX Certificate

APROPOS the note regarding the Alaskan DX Certificate published on page 477 of the April, 1955, issue of the BULLETIN, G3AAE states that contacts in connection with this award must have been made since January 1, 1955.

Affiliated Societies' Contest, 1956

Rules

1. The contest is open to all Societies in fully paid-up affiliation with the R.S.G.B. Each competing Society must submit an entry signed by an officer of the Society, stating the call-sign to be used. Entries must be addressed to the Hon. Secretary, Contests Committee, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1, postmarked not later than December 31, 1955. No alteration of call-signs will be permitted after the closing date for entries. A full list of all competing stations will be circulated direct to each Society by post during January, 1956.
2. The contest will be confined to two-way telegraphy (A1) contacts only, and will be in two sections. The first section will be held between 18.00 and 23.00 G.M.T. on Saturday, February 11, 1956, and the second section between 18.00 and 23.00 G.M.T. on Sunday, February 12, 1956.
3. Operation will be in the 1.8 Mc/s band.
4. Only one transmitter—which may be either the Society transmitter or that of one of the members—and not more than two receivers may be used.
5. The input to the anode circuit of the valve or valves delivering power to the aerial, or to any previous stage, must not exceed 10 watts.
6. Ten points will be scored for contact with another Affiliated Society station, and one point for contact with any other British Isles station. The final score will be the sum of the scores for the two sections.
7. Only contacts with stations in the British Isles (prefixes G, GC, GD, GI, GM and GW) will be permitted to count for points. Proof of contact may be required.
8. Competitors will call "CQ RSGB." An exchange of RST reports and a self-assigned three-figure number starting between 001 and 100, and increasing with each successive contact, will be required before points may be claimed.
9. Only one contact with a specific station will be permitted to count for points in each section of the contest.
10. Transmitter operators may be changed as often as desired, provided the terms of the licence are observed.
11. Logs (preferably on foolscap or quarto paper) must be set out as shown below:—

Affiliated Societies' Contest, February, 1956

Name of Society.....Claimed Score.....
Address of Station.....Call-sign.....
Transmitter .....
Receiver(s) .....
Aerial(s) .....

Date	Time	Call-sign of station worked	Report and serial no. SENT	Report and serial no. RECEIVED	Signature of Operator	Points Claimed
		G2——	*589001*	*579005*		
		G3——	*599002*	*599016*		
		G2——	*569003*	*559025*		
					Total...	

Declaration: I declare that the station for which I was responsible was operated strictly in accordance with the rules and spirit of the contest, and I agree that the entry will become the property of the Council of the R.S.G.B. whose decision shall be final in all cases of dispute.
Date..... Signed..... Office.....

12. The entry form must be completed and signed by an officer of the Society, who will be held responsible for the conduct of the station.
13. The terms of the Amateur (Sound) Licence must be strictly observed.
14. Any station reported operating off-frequency, or causing interference due to poor notes or spurious emissions, may be disqualified.
15. Any station frequently receiving tone reports lower than T9 will be disqualified.
16. The *Edgware Trophy* will be awarded to the Affiliated Society with the highest total score.
17. The decision of the Council of the R.S.G.B. will be final in all cases of dispute.
18. Entries must be postmarked not later than February 20, 1956, and must be addressed to the Hon. Secretary, Contests Committee, R.S.G.B., New Ruskin House, Little Russell, Street, London, W.C.1.

Affiliated Societies' Contest, 1956

The attention of all Affiilated Societies is drawn to Rule 1, which requires that entries must be submitted by December 31, 1955.

Contests Diary

1956

January 14–15	-	Top Band No. 1
January 28–29	-	B.E.R.U.
February 11–12	-	Affiliated Societies
(Closing date for entries: December 31, 1955)		
May 6	- -	Two Metre Field Day No. 1
June 2–3	- -	National Field Day
(Closing date for entries: March 31, 1956)		
June 17	- -	420 Mc/s Contest No. 1
July 7–8	- -	Two Metre
August 19	- -	Two Metre Field Day No. 2
September 2	-	Low Power Field Day
September 2	-	1250 Mc/s Tests
September 9	-	420 Mc/s Contest No. 2
October 6–7	-	Low Power Contest
November 10–11		Top Band No. 2
November 24–25		21 Mc/s Phone Contest

Slow Morse Practice Transmissions

G.M.T.	*Call*	*kc/s*	*Town*
Sundays			
09.00	G3GYV	1900	Hartford, near Northwich
09.30	G3BKE	1900	Newcastle-on-Tyne
10.00	G6MH	1990	Southend-on-Sea
10.30†	G3DGN / G3GZB	1930	North London
11.00	G2FXA	1900	Stockton-on-Tees
12.00	G3LP	1850	Cheltenham
12.00	G3JBU	1850	Northampton
12.00	G15UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
19.00	G3NC	1825	Swindon
19.00	G3JBU	1850	Northampton
20.45	G3EKW	1915	Nottingham
21.00	G3BLN	1900	Bournemouth
21.00	G3FSM	1900	Brentwood
22.15	G2BRH	1900	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
18.30	G3JMP	1875	Bristol
20.30	G3GDZ	1905	Kingsbury, N.W.9
21.00	G3EFA	1855	Southport
22.30	G3IIR	1915	Norwood
Wednesdays			
18.30	G3GCY	1830	R.A.F., Dishforth
19.00	G3HUB/A	1902	Chelmsford
22.30	G3FBA	1910	Bath
Thursdays			
19.00	G3NC	1825	Swindon
20.00†	G2CPS / G2CNX / G3GWT	1910	Hull, Yorks.
20.30	G3JQM	1878	Barwick, Yeovil
22.30	G3ADZ	1940	Southsea
23.00	G3LA	1915	Brentwood
Fridays			
18.30	G3GEN	1900	Gloucester
19.00	G3BLN	1900	Bournemouth
20.00†	G3CSG / G3EGX / G3ERB	1875	Wirral
20.30	G3ICX	1915	Sutton Coldfield
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
21.00	G3HWI	1987	Blackburn, Lancs.

† *Alternately.*

Nineteenth B.E.R.U. Contest 1956

RULES for the Nineteenth B.E.R.U. Contest to be held on January 28 and 29, 1956, are substantially the same as for the 1955 event, the only significant change being to Rule 15. Non-transmitting members will be pleased to see that the Receiving Contest has been re-instated.

Rules

1. The Event is divided into two Telegraphy Sections, namely:—
   (a) Senior (maximum licensed power).
   (b) Junior (maximum input 25 watts).

2. The Event (Senior and Junior) will take place from 0001 G.M.T. Saturday, January 28, to 2359 G.M.T. Sunday, January 29, 1956.

3. The Contests are open to all British subjects living within the British Empire and British Mandated Territories and to members of British Forces of Occupation operating properly authorized stations, who are fully paid-up members of either the R.S.G.B. or one of the British Empire Societies listed below. All entrants agree to be bound by the Rules of the Contests.

4. An entrant who is not a member of the R.S.G.B. must certify in the declaration that he was a fully paid-up member of one of the listed British Empire Societies and that he was resident in that country at the time of the Contest.

5. An entrant not located in one of the prescribed Prefix Zones shall be considered as being in the Prefix Zone nearest to his station.

6. Only the entrant will be permitted to operate his station for the duration of the Contest.

7. Entries must be legibly written or typed on quarto or foolscap paper as set out in the example, using one side of the paper only. Sheet 1 will bear the name, address, etc., and the declaration; Sheet 2 the analysis. Continuation sheets will continue the log in time order (G.M.T.).

8. All entries must be posted within 14 days of the close of the Contest—post-marked not later than February 13, 1956—and must be addressed to the R.S.G.B. Contests Committee, New Ruskin House, 28/30 Little Russell Street, London, W.C.1. The closing date for acceptance of entries is May 1, 1956.

9. The judging of entries will be carried out by the R.S.G.B. Contests Committee. The decision of the R.S.G.B. Council will be final in all cases of dispute. No correspondence will be entered into regarding any decision made by the Council or the Contests Committee.

10. Operation is restricted to the following bands: 3.5, 7, 14, 21 and 28 Mc/s. Transmissions must be of type A1 (pure c.w.) only, and frequent tone reports of T8 or less may result in disqualification.

11. The conditions laid down in the entrant's licence must be observed. The input to the valve or valves delivering power to the aerial must not exceed 25 watts in the Junior Section.

12. Contacts may be made with any station using a British Empire call-sign in any of the Territories indicated in Rule 3, except that contacts with stations in the entrant's own zone, or with mobile or unlicensed stations in places where licenses are obtainable, will not count for points. Only one contact per band with each station will count for points, but duplicate contacts should be logged. The decision as to whether or not a station is valid will rest with the R.S.G.B. Contests Committee.

13. For each zone (outside the entrant's own zone) the first contact on a specific band will count 15 points, the second contact 14 points, and so on till after the 14th contact they count 1 point each. This system will be repeated on each band. For entrants outside the British Isles, Zone 2 is subdivided into three zones under call-sign figures: (a) call-signs with figures 2 and 4; (b) call-signs with figure 3, and (c) call-signs with figures 5, 6 and 8. Thus, for example, stations signing G3, GC3, GD3, GI3, GM3 and GW3 are all in Zone 2b. British Isles stations cannot work each other for points.

14. Serial numbers must be exchanged and acknowledged before a contact can count for points. The serial number of 6 figures is made up of the RST report plus three figures which may start with any number between 001 and 100 for the first contact and will increase in value by one for each successive contact; e.g., 087 for the first and 088 for the second contact, etc.

15. A trophy or miniature cup will be awarded to the winner of each section, and certificates will be awarded to the first three entrants in each section. In addition a certificate will be awarded to the leading entrant in each zone regardless of the number of entrants in his zone provided that his score exceeds 1000 points in the Senior section or 500 points in the Junior section. A certificate will be awarded in each zone in which there are ten or more entrants, to the runner-up, provided his score exceeds 1000 points in the Senior section or 500 points in the Junior section.

BRITISH EMPIRE SOCIETIES

Amateur Radio Society of India, Canadian Section A.R.R.L., Ceylon Amateur Radio Society, Hong Kong Amateur Radio Transmitters' Society, Jamaica Amateur Radio Club, Malta Amateur Radio Society, Montreal Amateur Radio Club, Newfoundland Amateur Radio Association, New Zealand Association of Radio Transmitters, Northern Rhodesia Amateur Radio Society, Pakistan Amateur Radio Society, Radio Society of East Africa, Radio Society of Southern Rhodesia, South African Radio League, Wireless Institute of Australia.

ENTRY FORM

SHEET 1 **Call-sign**.....

B.E.R.U. Contest, 1956.....**Section**

Name (Block Letters).....

Address .....

Input Power to Final Stage.....

Aerials Used

(Other station details should preferably be included)

DECLARATION:—

I hereby certify that my station was operated strictly in accordance with the rules and spirit of this Contest, and I agree that the decision of the Council of the R.S.G.B. shall be final in all cases of dispute.

Date..... Signed.....

If an entrant is a non-member of the R.S.G.B., he must sign the following additional Declaration:—

I hereby certify that at the time of the Contest I was a fully paid-up member of.....

Date..... Signed.....

Date	G.M.T. Contact Estab-lished	Band Used Mc/s	Call-Sign of Station Worked	Serial Nos. Sent	Serial Nos. Rcvd.	Points Claimed	(Leave Blank)

Total ... ...

ENTRY FORM

SHEET 2 **Prefix Zone Analysis**

	Prefix Zone	Mc/s Contacts	Mc/s Points	Mc/s Contacts	Mc/s Points	Mc/s Contacts	Mc/s Points
1	AP, VU, 4S7						
2	(a) All G prefixes with figures 2 and 4						
	(b) All G prefixes with figure 3						
	(c) All G prefixes with figures 5, 6 and 8 **(see Rule 13)**						
3	DL2, MB9...						
4	MD, MF, ZB, ZC4, 5A2C ...						
5	VE1, VO						
6	VE2						
7	VE3						
8	VE4, 5, 6						
9	VE7, 8						
10	VK2, 4						
11	VK3, 7						
12	VK5, 6						
13	VK9, VR4...						
14	All VP except VP8						
15	VP8, VK1						
16	VQ1, 3, 4, 5						
17	VQ2, ZD6, ZE						
18	VQ6, 8, 9, VS9, MP4, ST, ZC2(M13)						
19	VR1, 2, 3, 5, 6, ZK, ZM... ...						
20	VS1-6						
21	All ZD except ZD6						
22	ZL...						
23	ZS1,2						
24	ZS3, 6, 9						
25	ZS4, 5, 7, 8						
	Totals						

Receiving Contest

1. To count for points the log must show in columns:— (a) date (b) time G.M.T. (c) band (d) station heard (e) serial number sent (f) station worked (g) points claimed. CQ or TEST calls will not count for points.

2. Each logging will score points in the same way as contacts in the Transmitting contest (see Rule 13 earlier).

3. The same station may be logged only once on each band.

4. Logs must be addressed and postmarked as for entries in the Transmitting contest.

Letters to the Editor . . .

QSL Cards

DEAR SIR,—I am interested in the letter from W3SOH in the October BULLETIN on the subject of QSL cards and agree with him completely about the value of the QSL card. That value may be entirely sentimental—but nevertheless it gives completion to a QSO and pleasure to most recipients, and sentiment is not to be despised. I have been licensed nearly 20 years and have so far *never* failed to send a QSL card for a first QSO to any station on any band—unless on the very rare occasion when asked not to do so. I cannot give an exact percentage of cards received but it is low.

Amongst countries worked on various bands from which no card has been received are: VP2, YI, PK1, VQ2, EK, ZC1, HK, MF2, MD1, EA8, HZ, VS7, VK7, 3A2, VP6, ZP5, ZC4, KG4 and VE8. Verification from some of these at least would have been appreciated.

The principle of sending cards only in return for those received is perhaps the " safest " plan. I should be glad to hear the experience of any other amateurs who have QSL'd really 100 per cent over a number of years.

Yours faithfully,

Dublin, Eire. (Rev. Canon) NOEL H. F. WARING (EI8J).

DEAR SIR,—At the risk of incurring the displeasure of G5UM regarding his rather curious Editorial on QSL cards and their collection, I would like to associate myself with W3SOH'S letter in the October BULLETIN.

No doubt his letter will be frowned upon by some of those who prefer to consider themselves as " learned in the art of radio "; but since radio is for me, a hobby, I prefer to enjoy it to the full and this includes not only the pleasure of contacts but also the sending and receiving of QSL cards.

I sympathize with W3SOH in the QSL policy of some DX stations but I also realize that QSLs cost money. However there is surely no justification whatever for a DX station to send " OK QSL " with no intention of forwarding one. It would be much better if he just sent " no QSL." Unfortunately, the more prominent a station becomes in the DX field, the less chance there is of a QSL from him. One has only to look at the " DX Honour Roll " in *QST* to discover this! W3SOH is, in fact, only too correct when he states that " American hams no matter what part of the world they are operating from, are the biggest offenders in QSLing." But I would qualify this by adding " after they have obtained a QSL from a particular country!"

No doubt some people would consider all this entirely irrelevant—apart from the writers of depressing BULLETIN Editorials of course! For them it will be ammunition for the next broadside. However, can we not endeavour to live together a little more amicably and learn, if not to agree with a certain aspect of our hobby, then at least to respect the other chap's point of view?

With regard to W3SOH's suggestion of a certificate for working all British counties—well why not? I have been asked by a number of overseas contacts interested in certificates why the Society does not issue one. Perhaps the Council have a reason for not doing so; if so may we know it please? It can surely not be " no interest?"

I can imagine cries of " What! more certificates." But anything that promotes interest in our country is surely a benefit? Such a certificate could be graded for various bands and perhaps thus benefit our Society—it would at any rate promote and foster some interest which is sadly lacking at the moment.

I hope that an official reply to W3SOH's request will be published.

Yours faithfully,

Sheerness, Isle of Sheppey. E. H. TROWELL (G2HKU).

N.F.D. Results

DEAR SIR,—I have read with some interest Mr. Deacon's remarks on N.F.D. results and Mr. Matthews' reply.

After carefully re-reading Mr. Deacon's letter, I still assume that he only requires that the results be published at an earlier date. I have not served on the Contests Committee and heaven forbid that such a sentence should be served on me. I can, however, appreciate the many hundreds of hours of laborious toil that is required for this contest alone.

If Mr. Deacon could suggest some positive manner in which the labour and time required for checking logs could be reduced then we would all be grateful. In the absence of such suggestions, it would be better either to keep quiet or to offer his services to the Contests Committee.

As I cannot suggest anything useful I will say thank you to the Committee for all the hard work you are doing and hope that one day you may find time for a little Amateur Radio.

Yours faithfully,

Pembury, Kent. L. S. KING (G4IB).

Experimental Transmitter G9AED (Lichfield)

DEAR SIR,—We are at present busy studying propagation characteristics of our transmissions on Channel 8 Band III and although we are receiving good co-operation from dealers and trade installers based on actual reception of our test card we are nevertheless interested in long distance reception reports of our sound channel on a frequency of 186.25 Mc/s.

The transmissions are vertically polarised and the vision test card is sent out on week days from 9.30 a.m. until 12.30 p.m. and in the afternoon from 2.30 until 6.0 p.m. and in the evening from 7.30 to 8.30 p.m. On Saturdays the transmission is from 10.0 a.m. to 1.0 p.m. There are no transmissions on Sunday.

Listeners to the sound transmission only will hear a continuous 600 c/s tone which is interrupted on the hour and at every subsequent 15 minute interval with an announcement of identity followed by information regarding times of transmission.

The station is located near Lichfield on a map reference 43/161044 and the effective radiated power from the aerial, which is at a height of 590 feet above sea level, is 200 watts.

We are particularly interested in receiving reports at distances greater than 100 miles and would like to know whether the signals are consistently received or are subject to either mild or complete fading.

Listeners should send their reports direct to our London address and each report will be duly acknowledged by means of our QSL card. We look forward to your co-operation in this matter.

Belling & Lee Ltd.,
Great Cambridge Road,
Enfield, Middlesex.

Yours faithfully,
F. R. W. STRAFFORD,
Technical Manager.

Book Review

THE MOBILE MANUAL FOR RADIO AMATEURS. (First Edition, 1955.) Prepared by the Headquarters Staff of A.R.R.L. 313 pages, fully illustrated, *QST* format. Price 22/6 from R.S.G.B. Sales Department.

This addition to the lengthening list of A.R.R.L. publications will be welcomed by the already substantial number of mobile operators in this country, and for them its appearance is timely. It is, in the main, a collection of the best *QST* articles on the subject, arranged to form both a text for newcomers and a handy reference when problems arise.

There is a section on receiving, including the suppression of noise from ignition and other sources. More than 30 mobile transmitters are described. Though one is a 250 watt job at 3000 volts, the great majority are of low-power, and include designs for all amateur bands from 144 Mc/s to 1.8 Mc/s, and multi-band cases.

The problem of operating a very small aerial at the lower frequencies is discussed with clarity by VE3BLW who gets down to some very useful calculations. Another article in the generous aerial section describes a multi-band design which uses multiple tuned circuits requiring no adjustment over the range 28 Mc/s to 3.5 Mc/s. Loop aerials, and even beams for as low as 28 Mc/s are included. The power supplies have, naturally, an American flavour, but will be of interest more generally.

This book will be most useful to mobile operators, but it will appeal to all amateurs who appreciate good design, for the limitations of space, power, and vibration, make an exceptional demand on ingenuity and skill.

T.P.A.

Regional & Club News

British Amateur Television Club (Birmingham).—M. Barlow (G3CVO/T), Editor of *CQ-TV*, was the speaker at the first meeting of the group held on October 16. Full details of future activities may be obtained from the *Hon. Secretary:* G. Flanner, 194 Aston Brook Street, Birmingham 6.

British Amateur Television Club (Chelmsford).—" A Staticon Camera Unit " by I. B. Howard (G2DUS/T) and " A Master Sync Unit " were subjects of recent lectures. There will be a film show at the meeting on December 13. The group meets on the second Thursday of each month at 10 Baddow Place Avenue, Great Baddow, Essex. Visitors are welcome. *Assistant Secretary:* D. S. Reid, 4 Bishop Road, Chelmsford, Essex.

Bristol.—" DX to Order " was the title of the talk given by H. J. Gratton (G6GN) at the October meeting. On November 18, D. V. Newport (G3CHW) will speak about " Some Aspects of Frequency Modulation." Council Member W. H. Allen, M.B.E. (G2UJ), will lecture on " V.H.F. Equipment " on December 9. *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 7.

Cambridge & District Amateur Radio Club.—A Junk Sale will be held at the " Jolly Waterman," Chesterton Road, Cambridge, at 8 p.m. on December 2. Meetings are held on the fourth Friday in each month at the same address.

Coventry Amateur Radio Society.—At the recent A.G.M. the following were elected: *Chairman:* D. W. Harries (G3RF); *Hon. Treasurer:* K. Barber (G3HDP); *Hon. Secretary:* J. H. Whitby (G3HDB); *Committee Members:* H. Chater (G2LU), K. Lines (G3FOH), A. Noakes (G2FTK), N. Bond (G3IHX), J. Faldon and R. Bastin. Meetings at 9 Queens Road are arranged for 7.30 p.m. on November 21 (" Low Cost Two Metre Transmitter," Ray Bastin), and December 5 (Lecture by A. Noakes, G2FTK). The Christmas Party will be held on December 19.

Cardiff.—Mr. Andrews (GW2DHM) will describe the special features of his transmitter at the meeting on December 12 at " The British Volunteer," The Hayes, Cardiff, commencing at 7.30 p.m. The October meeting was well attended, those present including ZD4BX who gave a talk. *Town Representative:* R. Morris (GW3HJR), " The Shack," St. Cenydd Road, Caerphilly.

East Kent Radio Society.—Details of the society's meetings at " The Two Brothers," Northgate Street, Canterbury, may be obtained from the *Hon. Secretary:* D. Williams, Llandogo, Bridge, Canterbury.

Grafton Radio Society.—Recent lectures have been on "Aerials " by F. J. Charman, B.E.M. (G6CJ) and " A 75 Watt Table Topper " by L. W. Skipper (G4LS). Classes in preparation for the R.A.E. are held on Mondays and Wednesdays and meetings on Fridays. *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

Isle of Man Amateur Radio Society.—The new clubroom now almost complete will provide facilities for slow Morse instruction, the building of equipment and the operation of the society's own station. A Brains Trust has been formed to help with members' problems. V.h.f. and QRP sections are being formed. Details of the winter programme of lectures and film shows may be obtained from the *Hon. Secretary:* M. R. Thompson (GD3JIU), 146 Ballabrooie Drive, Douglas, I.o.M.

Leeds Amateur Radio Society.—Greatly increased membership has permitted the most ambitious programme in the society's history to be planned for the winter season. Recent activities have included visits to the Holme Moss television station, the Electronic Stencil Machine at Roneo Ltd. and the Leeds Training Centre of the R.N.V.(W.)R. Meetings are arranged for November 16 (Junk Sale) and November 29 (R.S.G.B. Recorded Lecture on " TVI-proof Transmitter Design "). On December 2, a Film Show arranged by Mullard Ltd. will be given at the Metropole Hotel, Leeds. Meetings are held on Wednesdays, commencing at 7.30 p.m., at 4 Woodhouse Square. The society's station is active under the call-sign G3BEW. *Hon. Secretary:* J. Michael Gale (G3JMG), 104 Bentley Lane, Leeds 6.

Lothians Radio Society.—Meetings will be held at 25 Charlotte Square, Edinburgh, at 7.30 p.m. on November 17 (" Seventy Centimetre DXpeditions to Drumore," J. W. Kyle, GM6WL), December 1 (" Model Control," Dr. A. S. Brown) and December 15 (" Building a Transmitter " by A. C. Grainger, GM3BQO). Details of Morse classes for beginners may be obtained from the *Hon. Secretary and Treasurer:* John Good (GM3EWL), 24 Mansionhouse Road, Edinburgh 9.

North Kent Radio Society.—Winners in the recent constructional contest were: *Class A:* First—G3HOZ (Oscilloscope, second—Les Clinch (Hi-fi Pre-amplifier), third—G3KHR (Television Time Base); *Class B* (frequency measuring device using not more than two valves): First—G3JBK (Field Strength Meter), second— G3JBK (G.D.O.) and third—G3IJW (G.D.O.).

Norwood & District.—At the October meeting Council Member W. A. Scarr, M.A. (G2WS) chose for the title of a lecture " A Weekend on the Moon." On November 19, B. W. Kersting of the Keston Manufacturing Co. will give a talk on transformer design.

Nottingham & District Amateur Radio Society.—Recent activities have included a play-back of the R.S.G.B. Recorded Lecture on " Mobile Operation." The next meeting at the Sherwood Community Centre will be on November 18 at 7.30 p.m.

QRP Society.—An informal meeting of the Society will be held at the R.S.G.B. Amateur Radio Exhibition on the afternoon of the last day. *Hon. Secretary:* John Whitehead, 92 Rydens Avenue, Walton-on-Thames, Surrey.

Scarborough Amateur Radio Society.—Redecoration of the new clubroom is now complete and work has commenced on the transmitter. Council Member Cliffe Metcalfe (G3DQ) has been elected a Life Member in recognition of his efforts to obtain and equip the new premises. R.A.E.N. activity continues high.

Slade Radio Society.—The A.G.M. will be held at Church House, High Street, Erdington, on November 25 at 7.45 p.m. R. Blackburn and F. G. Taylor of B.I.C.C. Ltd. will give a lecture on " Wires and Cables associated with Telecommunication Equipment " at the meeting on December 9. An exhibition of members' equipment, including entries for the " Enterprise Trophy," will be held on December 23. *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.

Solihull Amateur Radio Society.—Meetings during 1956 will be held at Defence Headquarters, Sutton Lodge, Blossomfield Road, Solihull, from January 2 fortnightly throughout the year, except for July and August, commencing at 7.30 p.m.

South Manchester Radio Club.—Meetings will be held at Ladybarn House, Mauldeth Road, Fallowfield, on November 18 (Cathode Ray Tube Film Strip, by G. Kenyon, G3HMF), December 2 (" Are You in the Band?" by M. Denny, G6DN) and December 16 (Junk Sale). *Hon. Secretary:* M. Barnsley (G3HZM), 17 Score Street, Bradford, Manchester 11.

Swindon Radio Club.—Mullard Valve and R.S.G.B. films will be shown at the meeting on December 9. Further details may be obtained from the *Hon. Secretary:* G. R. Pearce (G3AYL), c/o 102 Kingshill Road, Swindon, Wilts.

Torbay Amateur Radio Society.—The Second Annual Dinner was held at the Oswalds Hotel, Babbacombe, on November 5. An R.S.G.B. Recorded Lecture by Louis Varney (G5RV) on " A TVI-proof Transmitter " will be given at the meeting on November 19. *Hon. Secretary:* L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

Can You Help?

● R. Parsons (GI3HXV), 134 Benmore Drive, Finaghy, Belfast, who requires details of the Master Oscillator Unit type 123 used in the Transmitter T.1403?

● W. H. Longhurst (GW3AAO), 82 Gower Road, Sketty, Swansea, who requires information on the American receiver type SLR12 (medium and two short wave ranges), made by Scott Laboratories, and the R.A.F. Test Set type 73 which uses a VCR138?

Representation

Regional Representatives

THE following is an amendment to the list of Regional Representatives published in the December, 1953, issue of the BULLETIN:—

Region 5—
T. A. T. Davies (G2ALL), Meadow Side, Comberton, Cambridge.
Mr. Davies' present period of office will terminate on December 31, 1955.

Region 4 Representative
Dr. Vance's address as from December 1, 1955, will be 43 Blackwell Road, Huthwaite, Sutton-in-Ashfield, Notts.

Region 13 Representation
For business reasons Mr. K. N. Senior (GM3AEI) has withdrawn his name as the Council's nominee for the office of Region 13 Representative for the two year period beginning January 1, 1956. Nominations for his successor should be made in the form prescribed on page 132 of the September, 1955, issue of the BULLETIN and should reach Headquarters by not later than November 30, 1955.

County Representatives
The following are additions to the list of County Representatives published in the December, 1954, issue:—

Region 1—East Lancashire
M. Barnsley (G3HZM), 17 Score Street, Bradford, Manchester, 11.

Region 6—Gloucestershire
E. A. Perkins (G3MA), 40 Calton Road, Gloucester.

* * *

Changes of Address
The address of Mr. N. T. Harper (G4MI), County Representative for Worcestershire, is now 20 Swiss Drive, Wordsley, Stourbridge.
The address of Mr. G. F. Nottingham (G3DTA), Town Representative for York is now 23 Abbotsway, Muncaster, York.

R.S.G.B. News Bulletin Service
GB2RS 3600 kc/s
Sundays
November 20, 11.00 G.M.T.
Commencing November 27, 10.00 G.M.T.

Affiliated Societies

THE following are amendments to the list of Societies published in the October, 1955, issue of the BULLETIN:—

Cheltenham Amateur Radio Society (G3GPW), c/o Mr. B. King, 126 Brooklyn Gardens, Cheltenham, Glos.

North-West Kent Amateur Radio Society, c/o Mr. G. C. Fox, 66 Homemead Road, Bickley, Kent.

Can You Help ?

● J. W. Moss (G3FUP), 88 Cornwallis Road, Dagenham, Essex, who requires the service manual and any other data for the ex-Army 21 set?

● G. Somerville (B.R.S.17692), 73 Balerno Street, Dundee, who requires details of the U.T.C. type P.A. 2L6 and U.T.C. type (Special Series) S.40 transformers manufactured by the United Transformer Co. of New York?

Silent Keys

ROY MILLARD (B.R.S.19693)

With sorrow we record the death of Mr. Roy Millard (B.R.S.19693), of Brentford, Middlesex. Although an invalid, Mr. Millard did much for others in the field of Amateur Radio.

L. G. H.

H. O. CRISP (B.R.S.207)

We record with regret the death of Captain H. O. Crisp (B.R.S.207), of Northbourne, Bournemouth. An expert in astronomy and sun-spot data, Captain Crisp had been interested in Amateur Radio for many years.

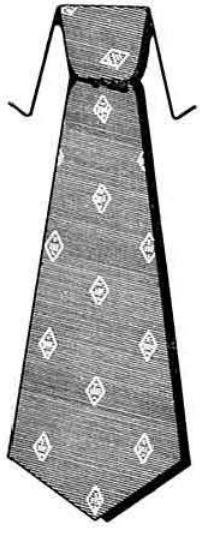
L. G. H.

ELECTRIC & MUSICAL INDUSTRIES LTD.

have made special arrangements to demonstrate His Master's Voice stereosonic tape records and reproducers during the period of the R.S.G.B. Amateur Radio Exhibition.

Tickets for the demonstration room on the first floor of Royal Hotel are obtainable from the R.S.G.B. Stand.

A USEFUL CHRISTMAS PRESENT



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Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—November 22, 7.30 p.m., 161 Penrose Avenue, Marton.
Bury.—December 8, 7.30 p.m., 52 The Drive, Seedfield, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby. — Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man (I.o.M.A.R.S.). — November 16, December 7, 21, Manor Guest House, Victoria Road, Douglas.
Lancaster (L. & D.A.R.S.).—December 7, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., St. Barnabas Hall, Penny Lane, Liverpool. **(M.R.S.).**—November 23, December 14, 28, Larkhill Mansion House, Queen's Drive, 13.
Manchester (M. & D.R.S.). — December 5, 7.30 p.m., Brunswick Hotel, Piccadilly. **(S.M.R.C.).**—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, 14.
Preston.—November 18, December 2, 16, 7.45 p.m., "The Copper Kettle," Garstang Road, Barton.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
Southport. — Thursdays, 8 p.m., Sea Cadet's Camp, Esplanade, Southport.
Stockport (S.R.S.).—November 23, December 7, 21, 8 p.m. The Blossoms Hotel, Buxton Road, Stockport.
Warrington (W. & D.R.S.).—November 17, December 1, 15, 7.30 p.m., King's Head Hotel, Winwick Street, Warrington.
Wirral (W.A.R.S.).—November 16, December 7, 21, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—November 25, December 9, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—November 22, December 13, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—December 14, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull.—November 29, December 13, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., 4 Woodhouse Square.
Middlesbrough (T.-S.A.R.C.).—November 25, 8 p.m., Settlement House, Newport Road.
Pontefract.—November 17, December 1, 15, 8 p.m., Queen's Hotel, Tanshelf.
Rotherham.—Wednesdays, 7 p.m., "Cutlers Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—November 23, 8 p.m., "Dog and Partridge," Trippet Lane. December 14, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—November 29, 7.30 p.m., Metropole Hotel, Leeds; November 30, 7.30 p.m., Medical Physics Department, General Infirmary, Leeds; December 14, 7.30 p.m., Bradford Technical College.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—December 2, 7.30 p.m., A Committee Room, Cadbury Bros., Bournville Lane. **(M.A.R.S.).** — November 15, 7 p.m., Midland Institute. **(Slade),** November 25, December 9, 7.45 p.m., Church House, High Street, Erdington.
Coventry.—November 25, 7.30 p.m., Priory High School. **(C.A.R.S.).**—November 25, December 9, 7.30 p.m., 9 Queen's Road.
Kenilworth, Warwick, Leamington.—November 17, 7.30 p.m., Dalehouse Lane, Leamington.
Malvern.—December 5, 8 p.m., "Foley Arms."
Redditch.—November 17, 8 p.m., 10 Woodland Road; November 29, 8 p.m., "Scale and Compasses," Birchfield Road.
Rugby.—December 1, 7.30 p.m., B.T.H. Recreation Club, Hillmorton Road.
Solihull.—November 28, December 12, 7.30 p.m., Defence Headquarters, Sutton Lodge, Blossomfield Road.
Stoke.—November 30, 8 p.m., "Lion's Head," John Street, Hanley.
Stourbridge (St.A.R.S.).—December 6, 8 p.m., King Edward VI School.
Walsall.—November 23, December 14, 8 p.m., Technical College, Bradford Place.
Wolverhampton.—November 21, December 5, 8 p.m., Stockwell End, Tettenhall.

REGION 4

Alvaston. — Tuesdays, Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Boulton Lane, Alvaston.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Derby College of Arts and Crafts, Subbasement, Green Lane.
Ilkeston (I. & D.A.R.S.).—Thursdays, 7 p.m., Room 5, Ilkeston College of Further Education, Field Road.
Leicester (L.R.S.).—November 21, December 5 (A.G.M.), 7.30 p.m. Hollybush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—December 7, 7.30 p.m., Technical College, Cathedral Street.
Newark. — December 4, 7 p.m., Northgate House, Northgate, Newark.
Northampton (N.S.W.C.). — Fridays, 7 p.m., Clubroom, 8 Duke Street.
Nottingham.—November 18, December 16, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough. — December 7, 7.30 p.m., 21 Hankey Street.
Retford.—December 1, 7 p.m., Sun Inn, Cannon Square.

REGION 5

Chelmsford.—December 1, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Lowestoft and Beccles (L. & B.A.R.C.). — November 23, December 14, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Gloucester (G.R.S.). — Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road.
Jersey, C.I.—November 29, 7.45 p.m., Chamber of Commerce, Royal Square.
Oxford (O. & D.A.R.S.). — November 23, December 14, 7.30 p.m., Club Room, "Magdalen Arms," Iffley Road, Oxford.
Portsmouth. — Tuesdays, 7.30 p.m., British Legion Club, Queen's Crescent, Southsea.
Southampton.—December 3, 7 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.
Cheltenham. — December 1, 8 p.m., Great Western Hotel, Clarence Street.

REGION 7

London. — December 16, 6.30 p.m., I.E.E., Victoria Embankment. (A.G.M.).
Acton, Brentford and Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 High Road, W.4.
Barnes, Putney and Richmond.—December 2, 337 Upper Richmond Road, S.W.14.
Bexleyheath.—November 24, December 2, 7.30 p.m., Congregational Hall, Chapel Road.
Bromley (N.W.K.A.R S.).—December 2, 8 p.m., Shortlands Hotel, Station Road, Shortlands.
Chingford.—November 25, December 9, venue from G4GA (SIL 5635) or B.R.S.19675 (SIL 6055).
Croydon (S.R.C.C.).—December 13, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road.
Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, W.5.
East Ham.—December 6, 12 Leigh Road.
East Molesey (T.V.A.R.T.S.). — December 7, 8.30 p.m. ("Recent Developments in 70 cm Operation," Frank Smith, G2DD), December 10 (Annual Dinner), Carnarvon Castle Hotel.
East London.—November 20 ("The Antenna-match," F. Hicks-Arnold, G6MB), December 18 (A.G.M.), 2.30 p.m., Town Hall, Ilford.
Enfield.—November 20, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finsbury Park. — November 15, 7.30 p.m., 16 Albion Road, Stoke Newington, N.16.
Guildford and Woking.—November 27, 3 p.m., Royal Arms Hotel.
Hendon & Edgware.—Wednesdays, 8 p.m., 21 Goodwins Avenue, Mill Hill.
Hoddesdon.—December 1, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.). — Mondays and Wednesdays (R.A.E.), Fridays, 7 p.m., Grafton School, Eburne Road, N.7. November 21-25, Islington Town Hall, Handicraft Exhibition (G3AFT).
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—November 19, Windermere House, Westow Street, Crystal Palace ("Transformer Design," B. W. Kersting).
Southgate and Finchley.—December 8, Arnos School, Wilmer Way.
Slough.—December 6, venue from G2HOX or G3BTP, 13 Quaves Road, Slough.
Sutton and Cheam (S. & C.R.S.).—November 15, December 20, "The Harrow," Cheam Village.
Welwyn Garden City.—December 5, G2NR, 22 Elmwood, Welwyn Garden City (Round Table Talk).

REGION 8

Brighton (B.D.R.C.). — Tuesdays, 7.30 p.m., "Eagle Arms," Gloucester Road.
Chatham (M.A.R.T.S.).—November 15, 29, December 13, 7.30 p.m., "Golden Lion," High Street, Brompton.
Hastings (H. & D.R.C.).—November 15, 29, December 13, Saxon's Café, Denmark Place.
Isle of Thanet (I.o.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.
Sussex R.A.E.N.—November 19, 7.30 p.m., Kings Head, Fishersgate.
Worthing (W. & D.R.C.). — November 14, 8 p.m., Adult Education Centre, Union Place.

REGION 9

Bath.—November 21, December 19, 7.30 p.m., 12 Pierrepoint Street, Bath.
Bristol.—November 18, December 9, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol, 1.
Exeter.—December 2, 7 p.m., Y.M.C.A., St. David's Hill.
Falmouth (W.C.R.C.).—Alternate Tuesdays, 7 p.m., Technical Institute (next meeting November 15).
North Devon.—December 1, G3BO, Rosebank, Westcombe, Bideford.
Plymouth.—November 19, December 17, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Torquay.—November 19, December 17, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare.—December 14, 7.30 p.m., R.A.F. Locking.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—December 12, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath and Port Talbot.—December 6, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Dunfermline.—Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.

REGION 14

Falkirk.—November 25, December 9, 7.30 p.m., The Temperance Café, High Street, Falkirk.
Glasgow.—November 25, 7.15 p.m., Christian Institute, 70 Bothwell Street, Glasgow, C.2.

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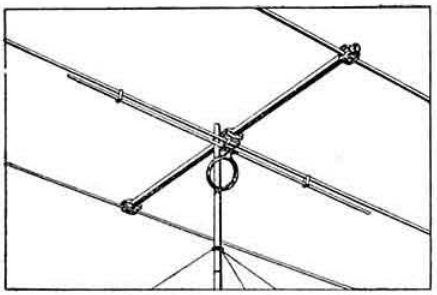

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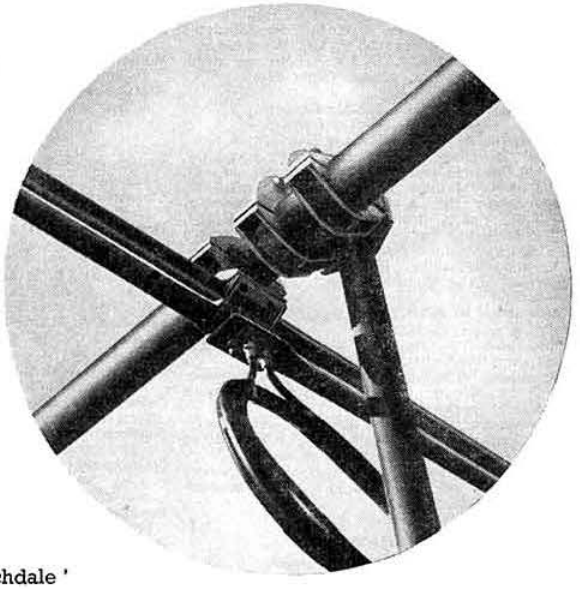

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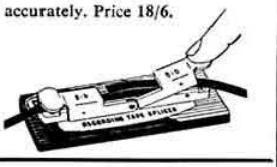

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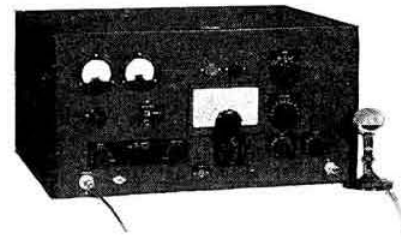

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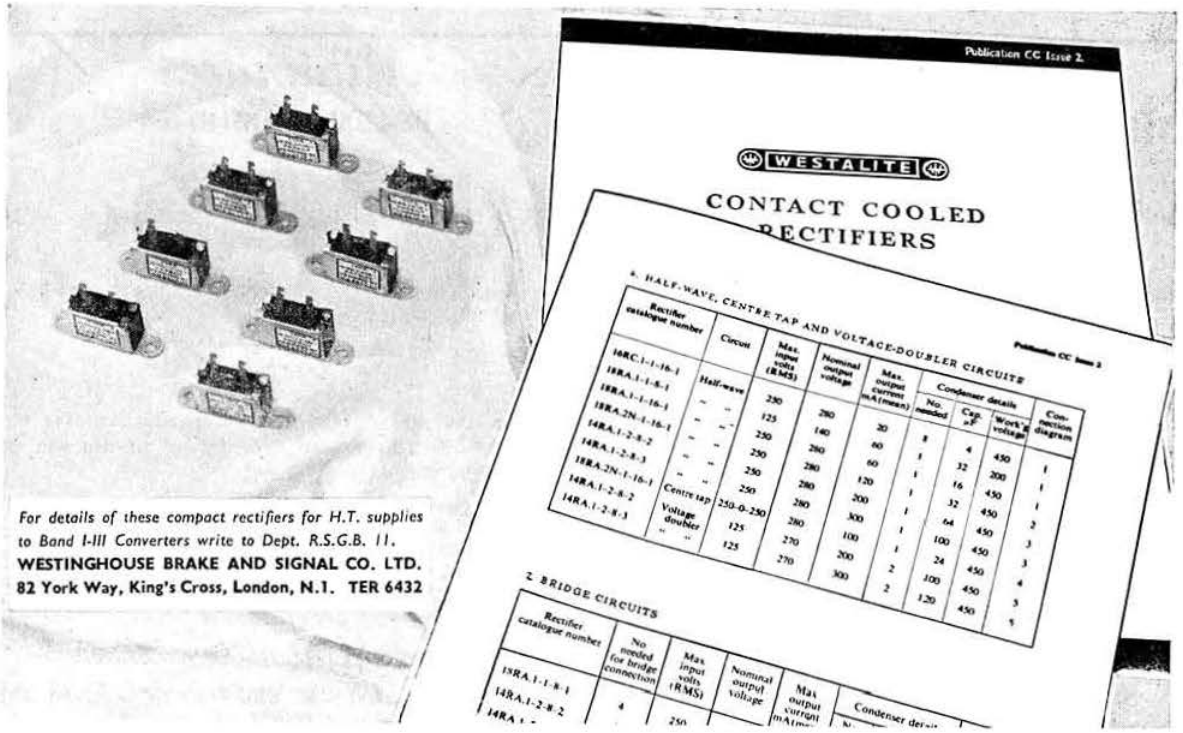

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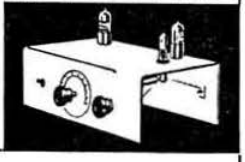

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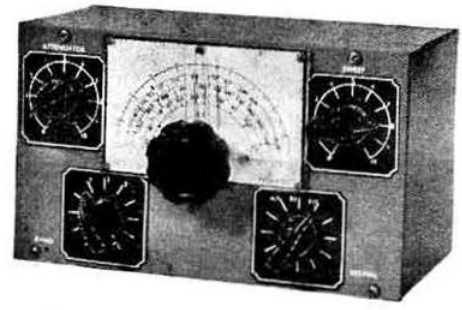

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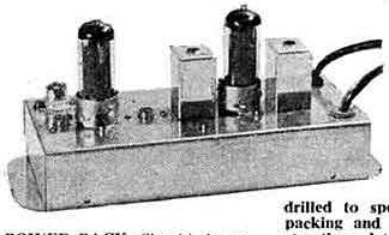

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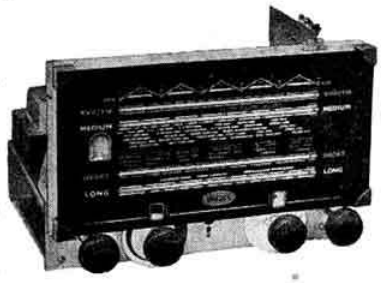

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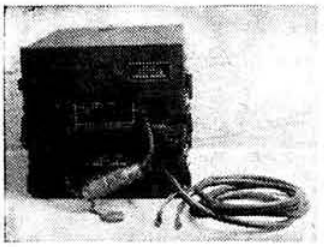

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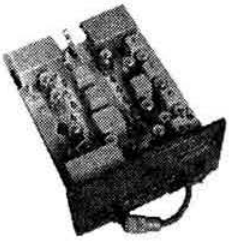

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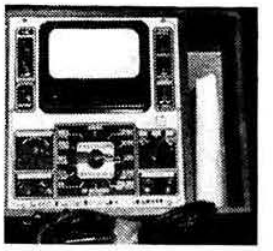

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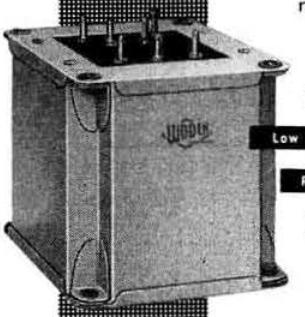

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Measuring Boxes 0/15,000 ohms by 1 ohm 0/16μF by .001μF **35/-** (5/-). **Power Amplifiers** 230V a.c. Rack mounting 2 x PX–25, 40lbs. (less valves) **35/-** (25/-*). **G.E.C. Transformers** 230/115V 250 watts. enclosed, double wound **40/-** (17/6*). **Woden H.T.** 190/250V to 4480, 2240, 2000V c.t. at 300mA wt. 62 lbs., 10" x 9" x 8" **£5.10.0** (20/-*) ditto to 640V 400 mA not c.t. **55/-** (15/-*). **VALVES.** New American 6C5, **10/-**; 6J5, **5/-**; 6K7, **5/-**; 6L6, **8/6**; 6L7, **7/-**; 6SJ7. **6/-**; 6SL7, **7/-**; 6V6, **6/-**; 12SG7. **6/-**; 807, **7/-**; 4212E, **45/-**; 1619. **8/-**; 866, **10/-**. **P.O. Racks,** de luxe type, 19" wide, drilled and tapped, 3" x 2" channel sides, 36" high, heavy base **40/-** (10/-). **T.E. 236 American Power Supply.** 115/230V to 250V, 200mA, regulated 90V d.c. and 6.3V 10 amps a.c. 14" x 9" x 9" heavy enclosed job, crackle finish, with 2 valves, **60/-** (17/6*). **EDDYSTONE 100 WATT TRANSMITTERS** in four units (1) R.F. (2) Modulator (3) Power Unit for 1 (4) Power Unit for 2. Designed for 500 to 1600 Kc/s. Each unit is enclosed in table mounting metal cabinet. Total weight about 4 cwt. a fine job, including 22 valves **£45.** Amount in brackets is carriage England and Wales. *Includes returnable case charged 10/-. Large quantity Ham gear. Lists available.

P. HARRIS
ORGANFORD, DORSET. *Lychett Minster 212*

EXCHANGE AND MART SECTION

ADVERTISEMENT RATES. Members' Private Advertisements **2d.** per word, minimum charge **3s.** Trade Advertisements **6d.** per word, minimum charge **9s.** (Write clearly. No responsibility accepted for errors.) Use of Box number **1s. 6d.** extra. Send copy and remittance to **National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4,** by **22nd** of month preceding date of issue.

ALL prices are for each item where more than one is available. Valves, brand new: VU111 (6) 1/-; 6SK7 gt (4) 5/-; 6SH7m (5) 4/-; 6SH7 gt 4/-; 12A6m 5/-; 12SK7m (2) 6/-; 12SR7m 5/-; 6F6m (2) 6/-; 954 (6) 4/-; 955 (6) 4/-; VT61 2/6; ARP35 (2) 2/6; VR91 2/6 used but 100 per cent; 354V 3/-; AC/HL 3/6; VT61A (2) 2/-; VR99 2/6; GV8G 5/-; DET20 (8) 3/-. Eddystone 4 element 2-metre beam complete with base section, brand new, unused 65/- R.S.G.B. 2-metre converter in Philpotts cabinet £5. 829B, 40/-. Bases (2), 5/- each. Vibrator unit, 2V in, 100V out, 25/-. Brand new meters moving coil: 0-30mA (2) 2in. round 4/-; 0-50mA (2) 2½in. round 5/-; 10-0-10mA 2½in. round 7/6; L and R indicators for 1155 (2) 7/-. Meters for RF thermocouple; 0-½amp (4) 2in. square 5/-; 0-350mA (35) 2in. round 4/6; 0-2½ amp (3) 2in. square 5/-; 0-3½ amp 2in. square 5/-; Hot wire 0-4 amp (2) rectangle with short switch, 6/-; Cawl gill motor with magnetic brake, built-in gears, perfect rotating beams, 12-24V, 25/-. Choke 20H, 250mA, 10/-. 0-5kV electro-static voltmeter 15/-. Sephton, 16 Bloemfontein Avenue, Shepherds Bush, London, W.12. (846

AMATEUR requires output transformer (901041) for R.C.A. MI-11220 speech amplifier. G3EOX, Midoran, Lambourne Drive, Baddeley Edge, Milton, Stoke-on-Trent. (836

AVO Model 7 in leather case. Valve tester and panel. Battery oscillator and a.c./d.c. Avominor in case. All as new. Philips R.C. Bridge, RCA modulation meter. Many valves (new) including 35T's and a quantity of components and meters. Must sell. Offers please BM/FADF, London, W.C.2.

B.C.221 complete with stabilised power pack, calibration book and instruction manual. Crystal missing. Quick sale £12.0.0 or best offer. Box No. 838, National Publicity Co. Ltd., 36/37 Upper Thames Street, London, E.C.4. (838

BC624, BC625, all valves, control rack, crackle case, as new £6.10.0. Another less 832's £5. Prefer buyer collect. S.a.e. enquiries. Lawn, 20 Croft Road, Godalming, Surrey. (844

BENDIX TA12D 150W, 80 and 40. Modified for 6.3V supply, 350V to doubler, PI network output. Power supply 500V 200mA twice, 200V 50mA, 6.3V 8A. Complete modulator with p.p. 807's. The whole for £15. G3JYO, 27 Arundel Crescent, Solihull, nr. Birmingham (ACO 1253)

B.R.S. member would like to buy new 1224 receiver; will collect to London area. Keeping, 26 Ellery Grove, Lower Buckland, Lymington, Hants. (854

CRYSTALS. 3A2BM wants 3.5 to 14 Mc/s crystals. Can offer 6/- each (more for 14 Mc/s fundamentals). State frequency, make, mounting. Mainprise, 48 Earlsfield Road, Hythe, Kent. (831

CR100, perfect, £17. Taylor 65B Signal Generator, perfect, £7. Gear and components. Send for lists. G3GKS, 17 Orton Road, Liverpool, 16. Phone: Childwall 1065. (801

D.S.T.100 manual wanted. Purchase for £1, or 10/- for six weeks' loan. G3JYG, Hall Cottage, Holt, Norfolk. (859

EDDYSTONE S640, as new, with 'S' meter, speaker, phones and handbook, £22. Receiver 1132, built-in stabilised p.p. 40/-; receiver 1147B, complete, 20/-; wavemeter, 120 kc/s to 20 Mc/s continuous, with charts, 40/-; RF26 and 25 complete 15/- the pair; Indicator unit type 6E complete in case, 25/-; 2 x GEC 465 kc/s crystals, new, 12/6 each; 3 x GET.1 transistors, new, 40/- the 3; 100 kc/s and 1000 kc/s bar, 10/- each; crystal calibrator 100 kc/s and 20 kc/s pips, with 3 valves and crystal, 30/-; 2½in. P.M. speaker, 7/6; laboratory meter 5in. scale, 1mA FSD, 10/-; HRO Vibrator Pack, 6 volt, unused, 20/-; Variac 220V 7.5 amps out, 30/-; Valves, pair 813's, unused, £6; 833 in crate, £5; 80 assorted transmitter and receiver, B7G, B9G, Octal, metal, and miniatures. VCR97 and VCR138, £8 the lot, or best offer over £45 for everything. B.R.S.18568, 53 Swanage Road, Birmingham 10.

EDDYSTONE S640 in good condition. £17. Watkins, G3CRK, 13 Lion Gate Gardens, Richmond, Surrey. (842

FERROGRAPH Tape Recorder Model "D" in Walnut cabinet. New condition throughout. Accept £48. Leak pre-amplifier, RC/PA/U, perfect, 70/-. TU5B unit, new, £1. Ham band Two, coils and power pack, £3. G3AO. 55 Derbyshire Road South, Sale, Manchester. (855

FOR SALE B2 transmitter, receiver, p.p. complete. Wilcox Gay v.f.o. R103 receiver for a.c. mains only. Offers to G2AGO, 11 Ascot Close, Ilford. (847

FOR SALE. Eddystone S640, £16. Any trial at 35 Kennington Palace Court, Sancroft Street, S.E.11. Reliance 3925, G3JYT. (857

FOR SALE Transmitter 3.7 to 28 Mc/s, 813 p.a. mod. TZ40s, Speech Clipper, separate power supply each section, 66 inch rack. Price £25. G3HRJ, 1 Wessex Gardens, London, N.W.11. (864

GUARANTEED—New Valves—EF50 (36), PT15 (4), 3/9; 6SN7GT (6), 6V6GT (4), 6AG5 (24), 6J6 (13), 6C4 (12), 5/-; STV280/40 (2), 726A (4), VCR139A (2), VCR97 (2), 10/-. Post extra. V. Cedar, 9 North Drive, S.W.16. (863

GUARANTEED valves 807's American 6 for £1. British 8 for £1. Red Sylvania EF50 2/- each. Enquiries. Box No. 840 National Publicity Co. Ltd., 36/37 Upper Thames Street, London, E.C.4. (840

G3ADZ requires one officer for Army Wireless Reserve Squadron. Applicants should be ex-R. Signals, and prepared to devote three evenings per month to AWRS duty, plus normal 15 days camp. Appointment will be that of trade instructor (wireless), and application would have to be made for AER commission in normal way. Write full details of previous service and qualifications to OC AWRS, 230 Devonshire Avenue, Southsea, Hants. (849

G3HQU offers Minimitter all-band table topper. Perfect £65. Type 12 set converted for crystal microphone £16. Gift. 1155 receiver, "S" meter, p.p., etc. Perfect £14.10.0 2-metre transmitter complete 829B P.A. phone/c.w. £20. Super ribbon microphone £3. 3-speed record player and amplifier, portable, £12.10.0. New. Crystal diodes, G.E.C., new, 1/9 each. Lots valves, components, other gear. Please send requirements. 40 James Street, Barrow, Lancs. (833

IMPORTANT NOTICE

All Exchange & Mart advertisements must be sent with remittance made payable to :

THE NATIONAL PUBLICITY CO., LTD.

36-37 Upper Thames Street, London, E.C.4

The Society and its Advertisement Manager cannot intercede in any matters arising from advertisements appearing in this section.

HAM S/W clearance! Limited quantity. S/W TRF receivers, all bands, hardly used; prices from 35/- only! About 10/- worth new free gear given away with orders! Unrepeatable! Send large s.a.e. without delay to Box No. 862, National Publicity Co. Ltd., 36/37 Upper Thames Street, London, E.C.4. (862

METALWORK.—All types cabinets, chassis, racks, etc., to your own specifications. Philpott's Metal Works, Ltd. (G4BI), Chapman Street, Loughborough. (99

OFFERS please for the following. Indicator unit type 182A complete except relay and transformer. VCR 139A 2½in. cathode ray tube, mounted on chassis with 4 speed time base. Transmitter/receiver TR9D modified for 160 metre phone 2V LT 120V HT with carbon microphone. Two 5μF condensers 4000V working. Crystals: 3145 kc/s, 4000 kc/s, 7055 kc/s, 7012 kc/s, 7025 kc/s, 3645 kc/s, 14,020 kc/s. R.S.G.B. BULLETINS: Vols. 12, 13, 14, 15, 16, complete. Vol. 17, No. 9. 11, 12, missing.. Vol. 24, No. 1, missing. Vols. 25, 26, 27, 29, 30, complete. Vol. 28, No. 5, 8, 10, 12, missing. Short Wave Magazines: Vols 8, 10, 11, 12, complete. The Radio Amateurs Handbook A.R.R.L. 26th edition. Several Radio Books. Shortly moving. All offers considered. E. Gant, G4DV, The Rookery, Leasingham, Sleaford, Lincs.

PATENTS and Trade Marks. Handbooks and advice free. Kings Patent Agency, Ltd. (B. T. King, G5TA, Mem. R.S.G.B., Reg. Pat. Agent), 146A Queen Victoria Street, London, E.C.4. Phone: City 6161. 50 years' refs. (98

(Continued on page 256)

EXCHANGE AND MART SECTION (Cont.)

QSLs and log book (P.M.G. approved). Samples free. State whether G or B.R.S. Atkinson Bros., Printers, Elland. (400

SALE. AR77, R.1132A, Rotary Converter, 230V a.c to 24V d.c. Eddystone loudspeaker complete. Offers. G3AAJ, Grangewood 6732, London. (829

SELLING up. Bargains. 150W table topper " Elizabethan." New with built-in n.b.f.m. unit, f.b. job. Black finish, engraved front panel. With p.u., £45. Eddystone '740' new, with speaker £30. Crystal calibrated wavemeter TE149, £5. Buyer of above items gets 75 watt modulator. All must go to good home. Brans, 46 Babsfield, Bentley, Farnham, Surrey. (848

SEVEN volumes BULLETIN July 46–Sept. 53, for sale (offers) or exchange for Vols. 1-7 " Radio Constructor." York, Waldrons Farm, Sidmouth Road, Farringdon, Exeter. (861

UNUSED 813, 30/- or exchange HRO coils types G and JA. Hay, 214 Burntwood Lane, Caterham, Surrey. (853

VALVES: new boxed; at 5/-, 12A6, 6K7, 5Y4, 6SQ7, 6R7, 6L7, 6X5; at 6/-, 6AK5, 6AV6, IT4, OC3W, OZ4, 6N7; at 7/6, 6Y6, 5T4, 6L6, 5Z3, 83; at 15/-, 809; at 20/-, 931A, 304TL; at 60/-, 4/65A; 25 watt c.w. phone. F.M. transmitter complete with v.f.o and power pack £25 or near offer. G3BSA, 27 Coach Road, Astley, Manchester. (839

WANTED BC610 Hallicrafters, E.T.4336 transmitters, and spare parts for same. Best prices. P.C.A. Radio, Beavor Lane, Hammersmith, W.6. (626

WANTED Collins 75A1 or 75A2 receiver. For cash or would part exchange new 680X. Tel. Bradley 293. (860

WANTED: HRO coils, receivers, power packs, AR88Ds, AR88LFs, SX28s, BC348s, AR77s, and many other types, also laboratory test equipment and R54/APR4, TN17, TN18 and TN19 units. Details please to R. T. & I. Service, 254 Grove Green Road, Leytonstone, London, E.11 (LEY 4986). (101

WANTED. 20-metre rotary beam aerial. G3ALH, " Fullerton House," Collingham, nr. Wetherby, Yorks. Phone: Collingham Bridge 242. (834

WODEN UM1. Elstone 500V. 250mA, 5V 3A, 6V 3A, 6V 6A. Admiralty 500V 170mA, 5V 4A. R.C.A. shrouded; 400V 150mA, 5V 3A, 6V 6A, R.C.A. shrouded; 10V 5A, c.t. twice. fils. Original boxes: 1616 (3), 826 (2), 6J6 (4), 832 (2). Unboxed: QVO4/7 (4), 815 (4), VCR 138 (1). Meters: new, 1 dozen assorted. 6.3V 6A, 5V 2A. Fils. Microphones: G.P.O. (1), hand microphone (1), carbon (2). Any reasonable offers? Box No. 856, The National Publicity Co. Ltd., 36/37 Upper Thames Street, London, E.C.4. (856

50 watt transmitter (Bendix TA 12–B) modified for a.c. mains operation, and ready for the air complete, only £6. Hallicrafters model S15 " Sky Challenger " receiver, in perfect order, a gift at £15. Any of the items listed are open to reasonable offers, and exchanges would be considered for QRP gear. Stamp for details to G3KKA, 79 Park Street, Thame, Oxon. (841

358X coils. Range A, 22,000-31,000 kc/s. Range F, 600 kc/s-1250 kc/s. Set of coil holders, 27/6 lot. B.R.S.20487, 244 Ballards Lane, Finchley, N.12. Hillside 4321. (852

813's—Brand new, boxed, 813's (6) at 45/- each. Catterick Amateur Radio Club, Loos Lines, Catterick Camp, Yorkshire. (851

APPOINTMENTS SECTION

Situations Vacant

V.H.F. TECHNICIAN required by the POLICE DEPARTMENT, BRITISH GUIANA on contract for one tour of 3 years. Salary at the equivalent rate of £1,200 a year with a gratuity at the rate of 22½ per cent of the salary. Free furnished quarters. Free passages. Liberal leave on full salary. Candidates must have had a thorough training in the principles of radio and have had experience in the maintenance of V.H.F. communication equipment (fixed and mobile sets). They must be able to train local personnel to maintain and operate the equipment. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/41236/RC. (830

APPOINTMENTS SECTION (Contd.)

MINISTRY OF TRANSPORT and CIVIL AVIATION RADIO TECHNICIANS. Appointments available for interesting work providing and maintaining aeronautical telecommunications and electronic navigational aids at aerodromes and radio stations in various parts of the U.K. Applications invited from men aged 19 or over who have fundamental knowledge of radio or radar with some practical experience. Training courses provided to give familiarity with types of equipment used. Salary £467.10.0 age 25 rising (subject to a practical test) to £565. Rates lower in Provinces and for those below age 25. Prospects of permanent pensionable posts for those who qualify. Opportunities for promotion to Telecommunications Technical Officer are good for those who obtain O.N.C. in Electrical Engineering or certain C.G. Certs. Max. salaries of Telecommunications Technical Officers: Grade III £695, Grade II £810, Grade I £985. Apply to Ministry of Transport and Civil Aviation (ESB1/RT), Berkeley Square House, London, W.1 or any Employment Exchange quoting Order No. Westminster 6627. (843

RADIO TECHNICIAN required by the GOVERNMENT OF KENYA for service as INSPECTOR OF POLICE, GRADE I (SUPERNUMERARY) for one tour of three years with possibility of permanency. Commencing salary (including present temporary allowance of 35 per cent of salary) according to previous experience in scale £796 rising £1,134 a year. Gratuity (at least £247 after three years' service). Outfit allowance £30. Uniform allowance £10. Separation allowance payable to married men under certain conditions. Free passages. Liberal leave on full salary. Candidates, preferably unmarried, aged 20–35, should be at least 5' 7" without footwear and be of good education. Vision—good standard required but men who wear spectacles are eligible provided that they are not greatly incapacitated without them. Candidates must hold City & Guilds Certificates in Radio and/or Telecommunications or have had at least four years' experience with the Technical Radio Branches of the Services or with a reputable firm of a Government Department. Married men should note that it is unlikely that accommodation could be found for their families during the first tour. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M1/36753/RC. (835

EXCHANGE AND MART SECTION

As from the January, 1956, issue of the BULLETIN *the following rates will apply to small advertisements in the Exchange and Mart Section:—*

Members' Private Advertisements: 2d. per word, minimum charge, 3/-. (If set in all capitals the charge will be 6d. per word, minimum charge, 9/-.)

Trade Advertisements: 6d. per word, minimum charge 9/-. (If set in all capitals, the charge will be 1/- per word, minimum charge 18/-.)

The charge for a Box Number will remain at 1/6.

When submitting advertisements members should write clearly and avoid ambiguous or uncommon abbreviations.

★

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This is Candler calling

ALL ENTHUSIASTS wishing to learn or to improve their speed and accuracy in Morse Code.

The Candler System of *home study* and practice embodies exclusive methods for quickly learning to read and send Morse Code. The Practice Equipment costs only a *few shillings*.

Thirty minutes of guided practice a day, the Candler way, is more beneficial than hours spent in hit and miss methods. This System is recognised throughout the World as the most efficient simple, and scientific method of Morse Code Training.

These are three Courses available:

(1) THE SPECIAL SHORT COURSE
For G.P.O. Morse Code test for securing Amateur Transmitting Licence, and for S.W.Ls.

(2) THE JUNIOR COURSE
A Complete Course for the Beginner.

(3) THE ADVANCED COURSE
For all who desire to increase their accuracy and speeds up to 20 or more w.p.m.

For Terms and Full Details, write for the BOOK OF FACTS which is sent post free, without any obligation.

CANDLER SYSTEM CO.

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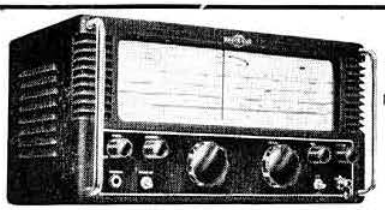

MODEL 840A

EDDYSTONE COMMUNICATION RECEIVERS

Model		Deposit	12 months	18 months	24 months
840A	£55	£19	£3- 6-0	£2 -6-0	£1-16-0
750	£78	£26	£4-15-4	£3 -6-6	£2-12-0
680X	£106	£36	£6- 8-4	£4- 9-6	£3-10-0
820	£38	£13	£2- 5-0	£1-12-0	£1- 5-0

820 is the new V.H.F. (F.M.) Receiving unit.
Illustrated brochure of any model gladly sent.

These instruments are the choice of experts throughout the world and are manufactured to the highest standards.
Latest Eddystone Component Catalogue 1/-.

HP RADIO SERVICES LTD.,
The Eddystone Specialists

55 COUNTY ROAD, LIVERPOOL, 4
Telephone: AINTREE 1445 *ESTAB. 1935*
Branch Address: MARKET CROSS, ORMSKIRK

HOME RADIO OF MITCHAM

for **EDDYSTONE**

No. 784 SKIRT KNOB
Overall diameter 3½", depth ¼". Brass insert and two grub screws.
Price **2/9**

No. 841 POINTER KNOB
Smooth plain sides. Length 1½", width ¼", depth ½". White engraved line. 6BA grub screw.
Price **10d.**

No. 842 DIAL ONLY
Satin finished aluminium dial 1¾" diameter marked in 10 divisions over 180 or 265.
Price **8d.**

Fully illustrated ***EDDYSTONE*** *catalogue price 1/-*

HOME RADIO

187 LONDON ROAD, MITCHAM, SURREY. MIT. 3282.
Open until 6.30 p.m. every day (Wednesdays 1.0 p.m.)
Buses 44, 77, 80, 115; Trolley Bus 630 PASS THE DOOR.

R.S.G.B. BULLETIN

(Published mid-monthly)

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36-37 UPPER THAMES ST., LONDON, E.C.4
Telephone Central 0473-6

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CONVERT YOUR EQUIPMENT INTO CASH!

We desire to extend our range of stock and equipment as quickly as possible.

Have you any of the following ?

ALL GOOD ELECTRONIC TEST EQUIPMENT by the following: AVO, Taylor, Marconi, GEC, Furzehill, Ferranti, General Radio, etc. Test Meters, Signal Generators, Universal Bridge, Meggers and all high grade instruments.

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U.S.A. TS EQUIPMENT
TS3, TS13, TSX-4SE, TS127, TS147, TS69, TS62, TS61, TS35, TS45, TS174, TS175, TS14 and all other Prefix Nos.

MICROWAVE TEST EQUIPMENT
Receivers R54/APR4 and Tuning Units TN16, TN17 TN18, TN19, and all VHF receivers, R1359, R1294, P58, P.47, Receiver ASB8.

BC221 Frequency Meters. We shall be prepared to give special consideration as to price offered for those Frequency Meters delivered or sent to us without delay.

KLYSTRONS, 2K33, 2K29, 2K39, 2K40, 707A—707B, CV129, etc. **VALVES** all types required.

Highest U.K. figure given promptly for all the above equipment in good condition. **CASH SENT BY RETURN.**

Call, write or phone NOW. GERard 8410-4447

UNIVERSAL ELECTRONICS

22/27 LISLE STREET, LEICESTER SQUARE, LONDON, W.C.2.

Shop hours, 9.30 a.m. to 6 p.m.
Thursday 9.30 a.m. to 1 p.m.
OPEN ALL DAY SATURDAY

G2AK THIS MONTH'S BARGAINS G2AK

Talking of Table Toppers

The Ideal Power Transformer for the Table Top Rig

This Parmeko-made transformer has the following conservative ratings. Primary 230 V 50 c/s. Secondary 620/550/375/0/375/550/620 V. Rated at 275 vA. It will give 620 or 550 volts at 200 mA simultaneously with 375 V at 250 mA. All the H.T. you require for R.F. and Modulator. Also 2–5 V 3 A windings for suitable rectifiers such as 5R4GY, 5Z3, 83, 5U4, etc. Weight 24½ lb. Size 6½" x 6½" x 5½" high. Worth at least £7.0.0. **Our Price £3.0.0 only.** Carriage Paid. C.W.O. only, no C.O.D.

We regret that we cannot accept orders for these from EIRE or Abroad.

Pi. Circuit Output Tuning Condensers Made by E. F. Johnson Co., U.S.A. Max. cap. 500 pF 1,500 V rating. Ceramic insulation, size 5" long x 2 1/16" wide, x 2 3/16" high (excluding Spindle projection). **Our Price only 15/- Post Free**

COPPER WIRE: 14G, H/D 140ft., **15/-**; 70ft., **7/6**. Post and packing 2/-. Other lengths pro rata.

RACK MOUNTING PANELS: 19in. x 5¼in., 7in., 8¾in., or 10½in., **black crackle finish, 5/9, 6/6, 7/6, 9/-** respectively, **postage and packing 1/6.**

SPECIAL VALVE OFFER: TZ40, **35/-**; QVO6/20 (6146), **35/-**; 829/3E29, **60/-**; 866A, **17/6**, or **30/-** per pair. 931A photo multipliers **35/-** ea. or 2 for **£3.** American 807 valves **7/6** ea. or 4 for **25/-.**

HEAVY DUTY POWER TRANSFORMERS: 0–240 tapped primary. Sec. 350/350 250mA, 5V 2.5 A, 24 V 5 A (tapped 6.3 and 12.6 V) **39/6** p. & p. 2/6.

DUAL OUTPUT POWER UNITS by Hallicrafter. Input 12 V DC; output (vibrator) 250 V 70mA; dynamotor 350 V 165mA. All fully smoothed and filter fully relay controlled. In grey finished steel case. All new in original cartons. Only **£4.17.6** carr. paid England.

TWIN FEEDER: 300 ohm twin ribbon feeder, similar, K25 **6d.** per yard. K35B Telcon (round), **1/6** per yard. Post on above feeder and cable 1/6 any length.

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