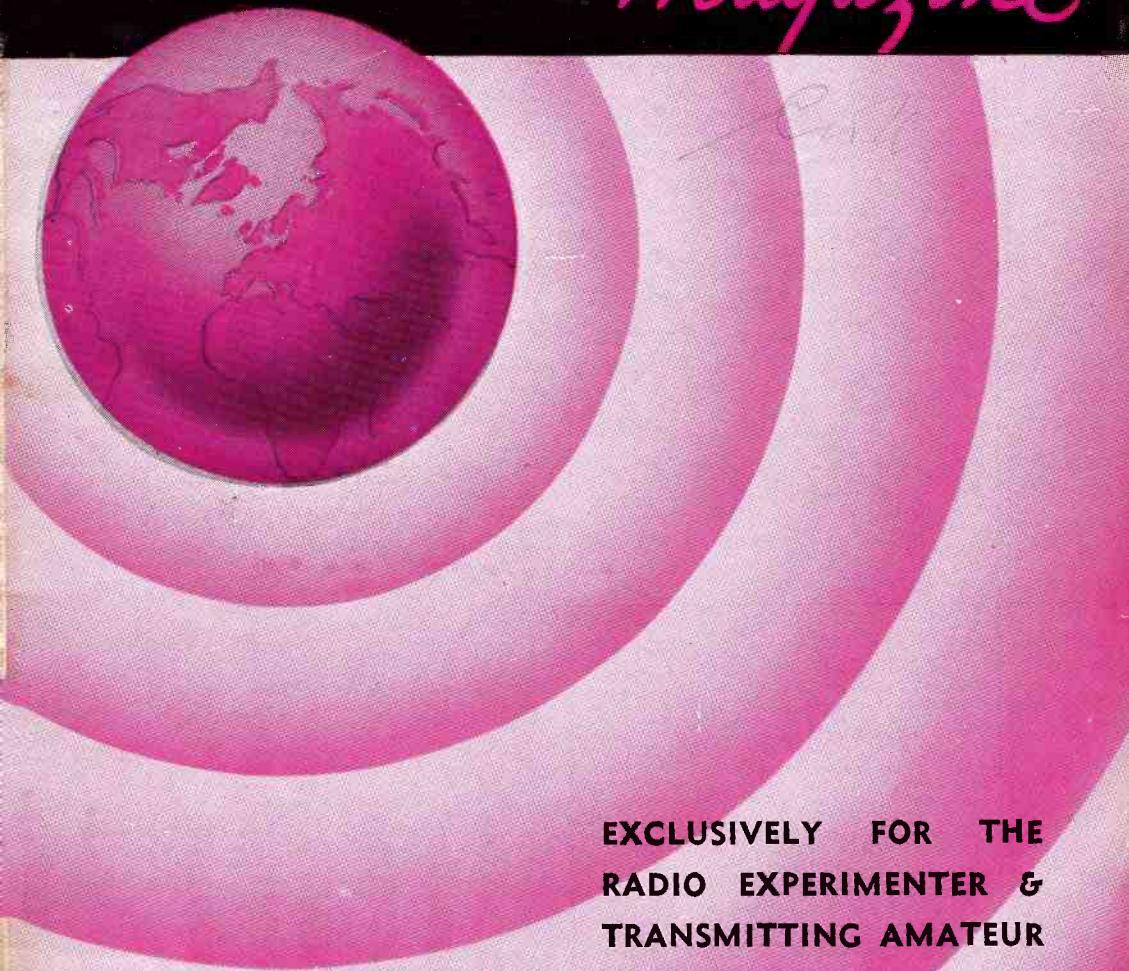


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# The SHORTWAVE Magazine



EXCLUSIVELY FOR THE  
RADIO EXPERIMENTER &  
TRANSMITTING AMATEUR

VOL. VIII No. 9 NOVEMBER 1950

# H. WHITAKER G3SJ

10 YORKSHIRE STREET, BURNLEY

Phone 4924

**XTALS.** The complete Xtal Kit in sealed cartons for the SCR 536 (BC611) Walkie Talkie. 14 xtals in all with 14 coils, 7 osc. and 7 final covering the complete freq. range of the unit. There are 7 tx. freqs. and a further 7 xtals spaced 455 kc for the receiver. All are in Ft 243 holders with  $\frac{1}{2}$ " pin spacing. The complete range is as follows : 3885/4340, 4080/4535, 4280/4735, 4397/4852, 4840/5295, 5327/5782, 5437/5892 kc. The complete kit including coils **56/-**, post free. Set of 14 xtals less coils, **48/-**, set of 14 coils, **8/-**. Any pair of xtals, **8/-**, with the exception of 5327.5 and 5295, these **7/6** each. All xtals are by leading U.S. makers.

**XTALS.** 1000 kc Biley, Valpey or Somerset, standard  $\frac{1}{2}$ " pin spacing **20/-**. 100 kc RCA, Biley, sub-standards, **17/6**. Marconi, etc., 500 kc British  $\frac{1}{2}$ " pin spacing, **6/-**. Western Elec. 500 kc  $\frac{1}{2}$ " Ft 243 holders, **7/6**.

**XTALS.** 3.5 Mc Band any spot freq., **15/-**.

**XTALS.** A complete range 450 kc to 500 kc any spot freq.,  $\frac{1}{2}$ " Ft 243 holders, by Western Elec. at **12/6** each.

**FOR 144 Mc.** Any freq. 8000 kc to 8110 kc Ft 243 fitting at **15/-**. A few Bendix  $\frac{1}{2}$ " pin spacing 8007.69 kc at **12/6**.

**FOR 28 Mc.** Any spot freq. from 7 Mc to 7500 kc at **12/6**, with the following specials. 7200, 7225, 7250, 7275, 7300, 7325, 7350, 7375, 7400, 7425, 7450, 7475, 7500 kc at **7/6** each or **72/-** per doz. All  $\frac{1}{2}$ " Ft 243 holders.

**FOR 7 Mc.** 7000 to 7300 kc any spot freq. at **12/6**, with the fone band specials as above.

**6 Mc Band for 144.** 6000 kc to 6083 kc any spot freq. at **12/6**, Ft. 243 holders.

**FOR 21 Mc.** 5250 to 5250 kc any spot freq., **12/6**, Ft 243 holders.

**TOP BAND.** Double, 850 kc to 863.5 kc and 937 to 1038.5 kc, Ft 243 holders, by Western Elec. Prolific harmonic generators. Plated type, spot welded contacts, mounted in air gap, at **5/-** each. To Commercial users and others. A complete range available from 2 Mc to 9 Mc in either  $\frac{1}{2}$ " or  $\frac{1}{4}$ " holders. The entire range by : RCA, Biley, Valpey, Stand, etc., and all leading American manufacturers. Quantity quotations are available on request. Export enquiries welcomed.

**VALVES RX AND TX.** All are brand new in sealed cartons, and carry our full guarantee. 6J5gt **2/6**, **24/-** per doz. 813 **27/6**, 803 **12/6**, 832 **17/6**, 866/866a **10/6**, HK257b **32/6**, 860 **17/-**, 836 **15/-**, 830b **22/6**, VU, 508 Vac rectifier 4v Fil. 2750v at 125 mils **8/-**, 807 RCA **6/-**, **60/-** doz. 955, 1625 **4/-**, 6L6g, 1622, 616, **8/-**, 6AG7, 6SG7, 6AG5, 80, 6C4, 1T4, 1R5, 6L7, **7/6**. 5Z4, 6N7, 6N7gt, 717a, 154, 6Q7, 6K6, 6AC7, **6/-**, **60/-** doz. 5W4, 6SK7met, 6SK7gt, 6J7met, 6X5, 6C5met, 6C5gt, 6J5met, 6SH7, 1A5, 9001, 9004, 7Q7, 12C8, 12SR7, 12SG7, 12A6 at **5/-**, **48/-** doz. VCR97 **32/6**. 100th at **30/-**.

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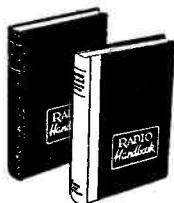
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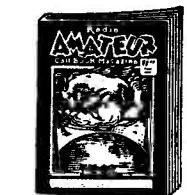
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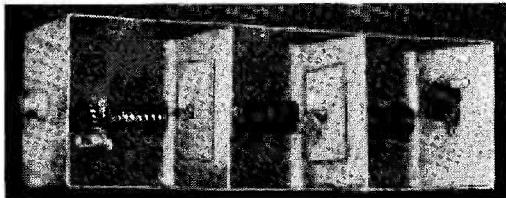
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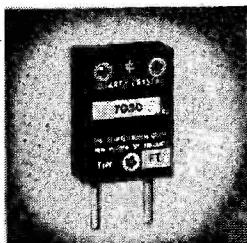
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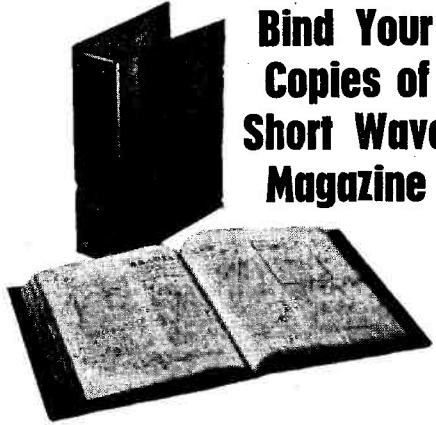
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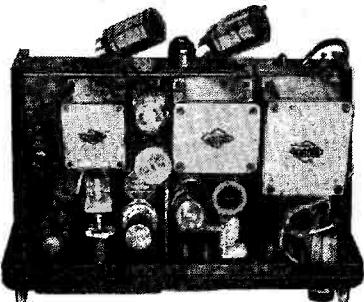
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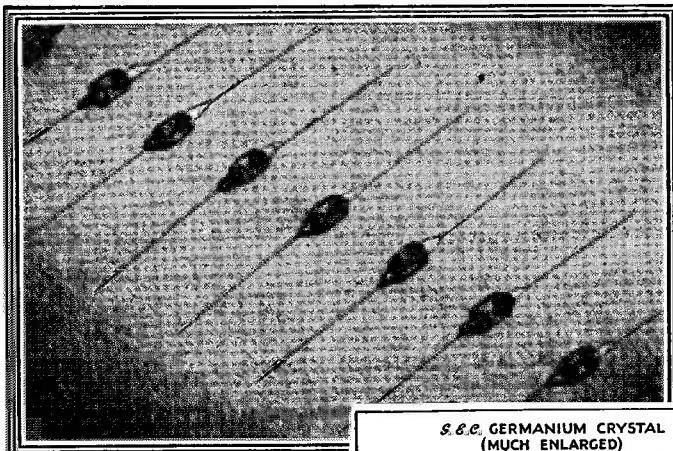
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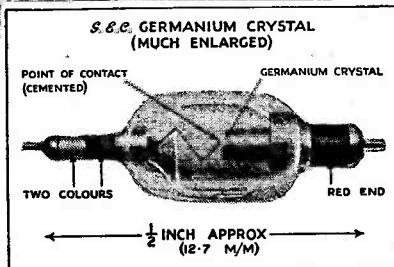
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	<i>Page</i>
Adecola	... 646
Amateur Radio Service	... 588
Anglin, T. J.	... 647
Ashworth, H.	... 642
Barnes Radio	... 646
Bartons	... 644
Bensons	... 640
B.I.E.T.	... 641
Brookes Crystals, Ltd.	... 640
Brown, S. G.	... 643
Butler Radio	... 586
Candler System	... 645
Clydesdale Supply Co. Ltd.	<i>cover iv</i>
Easibind	... 588
Electrad Radio	... 640
Electradix Radios	... 638
E.M.I.	... 637
Fanthorpe	... 590
Fields	... 647
Ford	... 648
Frith Radiocraft	... 591
G.E.C.	... 594
G.S.V., Co.	... 637
Gage & Pollard	... 585
H.A.C. Short-Wave Products	648
Henry's	... 591
Hoile, A. C.	... 647
H.P. Radio Services Ltd.	... 641
Johnsons	... 647
Lawrence, G.	... 587
Lyons Radio	... 591
Marks, C.	... 637
McElroy Adams	... 592
Multicore	... 636
P.C.A. Wireless	... 642
Pearson, M. J.	... 648
Precision Equipment	<i>cover iii</i>
Premier Radio	... 596
Pullin (M.I.)	... 639
Q.C.C.	... 586
Radio & Elec. Mart	... 638
Radio Clearance	... 641
Radio Exchange	... 639
Radio Servicing Co.	... 642
Radio Supply Co.	... 639
Rock Radio	... 646
Rolleff, H.	... 648
Samsons Surplus Stores	... 644
Salford Elec.	... 636
Speda Prod.	... 646
Small Advertisements	643-648
Smith, H. L.	... 638
Southern Radio & Elect.	... 643
Southern Radio	... 645
U.E.I.	... 592
Weston Products	... 589
Whitaker, H.	<i>cover ii</i>
Woden Trans.	... 590
Webbs	... 593
Young	... 593

# SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR & AMATEUR RADIO

**Vol VIII NOVEMBER 1950 No. 88**

## CONTENTS

	<i>Page</i>
<b>Editorial</b>	... 597
<b>The ASB8 on Seventycentes</b> , by R. Rew	... 598
<b>Practical Super Modulation</b> , by F. C. Judd (G2BCX)	... 608
<b>What They Are Told About Us</b>	... 614
<b>DX Commentary</b> , by L. H. Thomas, M.B.E., (G6QB)	... 615
<b>New QTH's</b>	... 623
<b>VHF Bands</b> by E. J. Williams, B.Sc. (G2XC)	... 624
<b>Here and There</b>	... 631
<b>The Month with the Clubs—From Reports</b>	... 632

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*Published the Friday following the first Wednesday each month at 53 Victoria Street, London, S.W.1 Telephone : Abbey 2384*

*Annual Subscription : Inland 20s. Abroad 22s. post paid*

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AUTHORS' MS

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The Vision Receiver, 4 R.F. stages (EF54s), Diode Detector and Noise Limiter (6H6) Video valve (EF54). Complete Kit with valves, £23/16/0. Carriage 2/6.

The Sound Receiver, 3 R.F. stages (6SH7s), Double Diode Triode (6Q7), which acts as Detector and L.F. Amplifier, Noise Limiter (EA50), output valve (6V6). Complete Kit with valves, £23/10/0. Carriage 2/6.

The Time Bases, blocking oscillators on Line (6SH7 and 807) and Frame (VR137 and 6V6). E.H.T. from Line Output Transformer. 10in. P.M. Speaker, Sync. separators 6H6 and 6V6.

Complete Kit with valves, £28/15/6. Carriage 5/-.

The Power Supply, double wound transformer isolating the receiver from the mains. Rectifier 5U4G. Complete Kit with valves, £24/16/6. Carriage 5/-. The following Sensitivity figures prove that the Premier Televisor Kit is capable of reception at greater distances than any other Standard Commercial Kit or Receiver whether T.R.F. or Superhet.

### VISION RECEIVER

Sensitivity: 25  $\mu$ V for 15v peak to peak measured at the Anode of the Video Valve.

Sound Rejection: Better than 40 db.  
Adjacent Sound Rejection: Midland Model. Better than 50 db.

### SOUND RECEIVER

Sensitivity: 20  $\mu$ V.  
Vision Rejection: Better than 50 db.

### CONSTRUCTION BOOK 3/-.

### PREMIER MIDGET RADIO KITS

Re-designed, easier than ever to assemble. These kits are now supplied with point to point wiring diagrams, all parts are supplied including attractive plastic cabinet 12" x 5" x 6", loudspeaker, valves, etc. Illuminated glass dial with new wave lengths. 190-540, 1,000-2,000 metres. For use on 200-250v mains. 6K7, 6SH7, and CV1510 beam power output valves in the A.C. and 6K7, 6SH7 and 12A6 valves in the A.C./D.C. model, both use metal rectifiers.

Please state if A.C. or A.C./D.C. is required.

Complete kit, £24/19/6, including Purchase Tax.

### PREMIER 3-BAND MIDGET SUPERHET KIT

Re-designed to receive the short, medium, and long wavebands, 16-50, 194-540, 1000-2000, with point to point wiring diagrams. A.C. valve line up, 6K8, 6K7, 6Q7 and CV1510 beam power output. A.C./D.C. is the same excepting the output valve which is 12A6. Please state which is required. Metal rectifiers are used in both models, and they are for use on 200-250v mains. Complete with cabinet as illustrated, loudspeaker, valves and all parts.

£26/19/6, including Purchase Tax.

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For the London or Birmingham frequencies at the same price as the standard kit

— £17/17/0 —

Five Easy to Assemble Kits are supplied:

Vision Receiver with valves, carriage 2/6 £23/13/6

Sound Receiver with valves, carriage 2/6 £22/14/6

Time Base, with valves, carriage 2/6 £22/7/6

Power Supply Unit, with valves, carriage 5/- £26/3/0

Tube Assembly, carriage and packing 2/6 £22/18/6

This unit includes the VCR97 Tube, Tube Fittings and Socket and a 6in. PM Moving Coil Speaker with closed field for Television.

The Instruction Book costs 2/6, but is credited if a Kit for the complete Televisor is purchased.

Any of these Kits may be purchased separately; in fact, any single part can be supplied. A complete priced list of all parts will be found in the Instruction Book.

20 Valves are used, the coils are all wound and every part is tested. All you need to build a complete Televisor are a screwdriver, a pair of pliers, a soldering iron and the ability to read a theoretical diagram.

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**VALVES.** We have large stocks of new boxed valves at very low prices. All exempt from Purchase Tax 1LC6, 1LD5, 1LNS, 1S4, 1S5, 1N5, 1T4, 3A4, 3D6, 5U4, 5Y4G, 5Z4, 6AC7, 6AG7, 6C5, 6F8, 6I5, 6J7G, 6K7, 6K8, 6N7, 6Q7, 6SA7, 6S17, 6SK7, 6SC7, 6SL7, 6SN7, 6U5, 6V6, 717A, 12A6, 9003, 9005, VR55 (EBC33), VT52 (EL32), VR56 (EF36), VR57 (EK32), VR116, VR136 (EF54), VR137 (E52), CV66 (RL37), CV1120 (SU2150A), CV1137 (RL16), CV1068 (AW4), CV189 (U19), CV2941 (EL50), VU39, 807, HYVAC XY, HYVAC XW, KT61, KTW61, U50, 6F6, AW4, 4060A, all 6/6, 6H6, 6SH7, 7193, VR78 (D1), all 2/6, VR54 (EB24), VR65 (SP61), VR92 (EA50), VR95 (954), VT121 (955), CV649 (956), CV102 (Xtal Diode), 1626, all 3/6, 6X5, HL23, RL18, VU111, VU133, VU134, CV6, CV73 (11E3), CV1189 (A6 Pen), CV656 (1625), CV639 (843), NS2, DQP, BL63 (CV1102), 1616, CV67 (klystron), U17, (CV1113), PT25H (CV1046), all 5/-. 1Q5, 1C5, 6C4, 6I6, 6AB7, 6S07, 6SG7, all 6/6, 2X2, U74, CV1262 (GU1), CV1141 (GDT4B), GU50 (CV1072), VT30 (CV1030), VR91 (EF50), all 7/6, 5V4, 6B8G, 25Y5, 25Z6, 2050, VT127 (Pen 46), CV1073 (KT66), (matched pairs, 18/6), all 8/6, 6L6, P27/500 (PX25), 705A, 832, CV662 (8012), DET5, all 10/-. 803, 10/-. 805, 10/-. 931A, 30/-. CV186, 40/-. CV19 (EHTT), 20/-. 861, 10/-. 838, 15/-. CV15 (EL266), 40/-. HY114B (CV3505), 15/-. MR300/E (CV3558), 15/-. E1232 (CV92), 20/-.  
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VCR517E, 20/-; VCR522, 15/-; ACR8, 15/-.

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# SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR AND AMATEUR RADIO

## EDITORIAL

### *Continuity*

The change in the general appearance of this issue is due to the fact that after more than four years we have been compelled to change our printers—and let us hasten to add that it is neither their fault nor ours. Rather, it has been dictated by the regrettable circumstances which have caused so much trouble and strife in London printing offices ever since May of this year.

Our readers will probably not have been aware—nor was there any reason why they should be—that for the last five or six months it has been increasingly difficult to ensure smooth production. Periodicals of every kind have been similarly afflicted (many of them have lost two issues altogether) and it says much for the resilience of private enterprise and the determination to maintain service that so little of this has been passed on to the general reader. So far as readers of SHORT WAVE MAGAZINE are concerned, it has meant only that we have been one week late with this one issue.

However, we may hope that such unhappy things are now past, and that once more we shall be able to apply ourselves to the business of giving you a good issue by the due date every month.

In our pages this time will be found two articles of particular value and unusual interest—the practical application of Super Modulation (of which much is now being heard), and the modification of a very fine "surplus" receiver for operation on the 430 mc band. Some very interesting 70 cm results are also reported in the VHF section, and broadly speaking the distances now being covered on Seventycems compare with those achieved on Two Metres when that band was being opened for GDX working.

AUSTIN FORSYTH, G6FO.

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## THE ASB8 ON SEVENTYCEMS

### Modification of a Surplus Receiver for 430 mc Operation

By R. REW

*The author of this article is a well-known SWL in the Midlands who for long has been specialising in VHF receivers. His contribution is a masterly exposition on the modification, for the 70 cm band, of a particularly fine piece of surplus equipment. The object was to produce from the ASB8 a VHF receiver complete in itself, suitable for either fixed-station or portable working, and capable of taking stabilised CW and phone transmissions on 430 mc. Even if a degree of mechanical skill does seem to be involved in the modification, this part of it is simple enough to have done locally—and, as we have said before, for effective constructional work on these frequencies, the ability of the model engineer can be allied to the knowledge of the radio amateur.—Editor.*

COMPARATIVELY speaking, there are very few receivers on the market really suitable for immediate use in the 70 cm band. Home-built converters and the receivers so far described have usually employed as the basis of their 70 cm circuitry tuning units taken from surplus equipment of one kind or another—the Type 105 oscillator unit, the R89A/ARN5A coaxial assembly and the TN18 of the APR4 radar search receiver, to name only a few. All of these have, however, suffered from one disadvantage: No pre-mixer RF amplification. This has been serious in view of the fact that many use crystal mixers which suffer a loss rather than a gain, as is usual with mixers in use on the lower frequencies. Nobody nowadays would consider using a 2-metre receiver without at least one RF stage, but on 70 cm the story is somewhat different. At this frequency coaxial tuning circuits give the most satisfactory performance in RF stages and the few valves capable of a worth-while performance are made to fit them. It is not surprising that the surplus market should be scanned for the basis of a 70 cm RF stage, as machining and lathe-work (to say nothing of silver plating the finished article) are somewhat beyond the majority of amateurs.

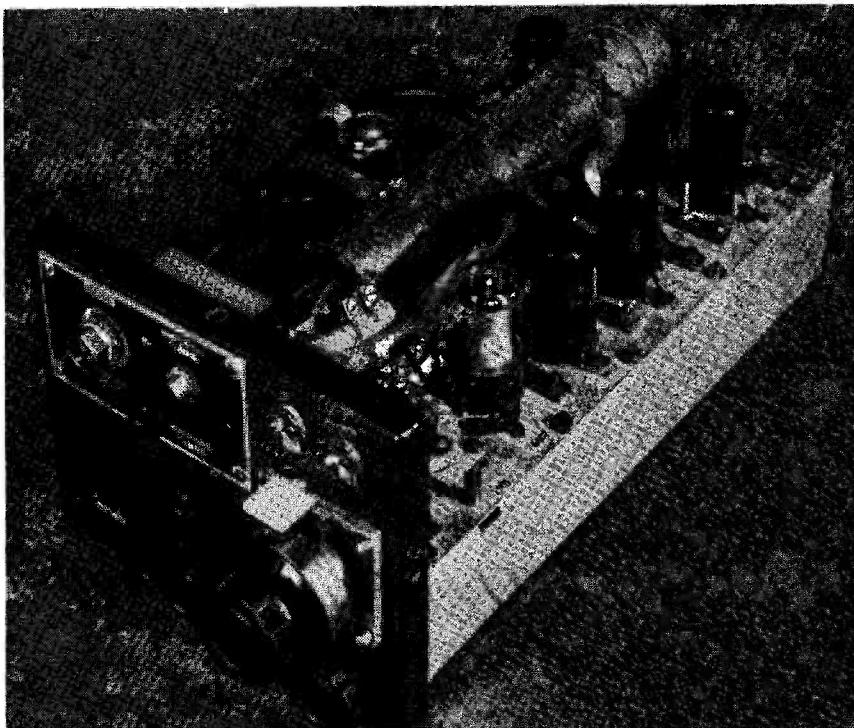
The only units so far found by the writer have been the ASB7 and ASB8 receivers of American manufacture. These appear to be identical in construction, and as the latter is the commoner of the two, it will be referred to throughout. These receivers are available in fair numbers, at quite reasonable prices. They have a superb and easily followed layout, and are mainly brand new, the precious coaxial circuits being

therefore in good condition. The designed operating frequency was 515 mc and it is therefore necessary to lower the RF circuitry 80 mc or so to get into the 70 cm band—usually a good point where any surplus conversions are concerned!

#### General Description

The ASB8 starts at the aerial with an exceedingly well made coaxial RF stage using a GL446A lighthouse valve. In order to clarify the mysteries of the ASB8 RF section, and possibly fire others with enthusiasm (and a few spare GL446's!) to make a Chinese copy, Fig. 1 has been drawn to show the "inside story." As can be seen in the photograph this stage occupies the top centre of the chassis, and mechanically consists of three concentric silver plated and highly polished tubes. At one end these are fixed to a suitably machined end block, while their other (open) ends make contact with the anode (*via* blocking condenser), grid and RF cathode respectively of the lighthouse. Perhaps it should be explained that these lighthouse valves have two cathode connections—one a DC connection brought out to one of the base pins, the other the RF cathode taken to the metal base ring of the valve and connected internally to the DC cathode through a low inductance condenser of about  $100\mu\text{F}$ .

The cathode-to-grid line is tuned by a multi-fingered movable slide, the control for which is preset and is the large knurled locking knob located under the coaxial assembly. (It is visible in the photograph immediately behind the VR150). The aerial input tap to the grid line also moves with this slide and



General view of the ASB8 after modification, showing the front panel controls. Additional panel bracing struts (not shown) should be fitted to provide better mechanical stability for the 1st oscillator.

comprises a springy finger which always makes contact about 1 in. from the shorted end formed by the slide itself.

Another slide of larger diameter tunes the grid to anode line and is controlled from the front panel by the screwdriver adjustment "Amplifier Tuning." This slide also carries the output coupling loop assembly which takes the amplified signal from the shorted end of the line formed by the slide, *via* a short length of coaxial cable to the mixer grid line.

The mixer grid coaxial tuner is 4 ins. long and 1 in. diameter with the RF amplifier output cable tapped on its centre conductor about  $1\frac{1}{2}$  ins. from the shorted end. The grid of the 955 mixer and its associated grid leak are coupled *via* a small capacity to the centre conductor near the open end, while the line as a whole is tuned by the small circular two-plate condenser at the extremity; this appears as another preset control on the panel marked "Mixer Tuning."

The 1st oscillator is a 955 acorn using two parallel lines connected directly to the grid and anode tags of the valve-

holder and shorted for RF at their far end by C926, a  $150 \mu\mu F$  ceramic tube condenser. Variable tuning is accomplished by a circular disc which, as it approaches the lines, lowers their inductance and *vice versa*. As it stands, the frequency range is approximately 430-505 mc, the oscillator therefore working on the low side of the signal frequency of 515 mc.

The 1st oscillator and mixer are cathode coupled by another coaxial line 4 ins. long and  $\frac{1}{4}$  in. diameter, with the mixer cathode tapped on the centre conductor about  $1\frac{1}{2}$  ins. from the shorted end.

Following the 1st mixer are two stages of IF amplification at 55 mc using 6AC7 valves. The frequency is then changed again, this time to 16 mc, the oscillator being a 6J5 at 39 mc and the mixer a 6AC7 with control grid injection. A form of sensitivity control appears to have operated on the screens of the 1st IF and 2nd mixer stages, a front panel socket labelled "Sens. Sw." allowing remote switching of the screen voltage. The screen of the 2nd IF stage goes

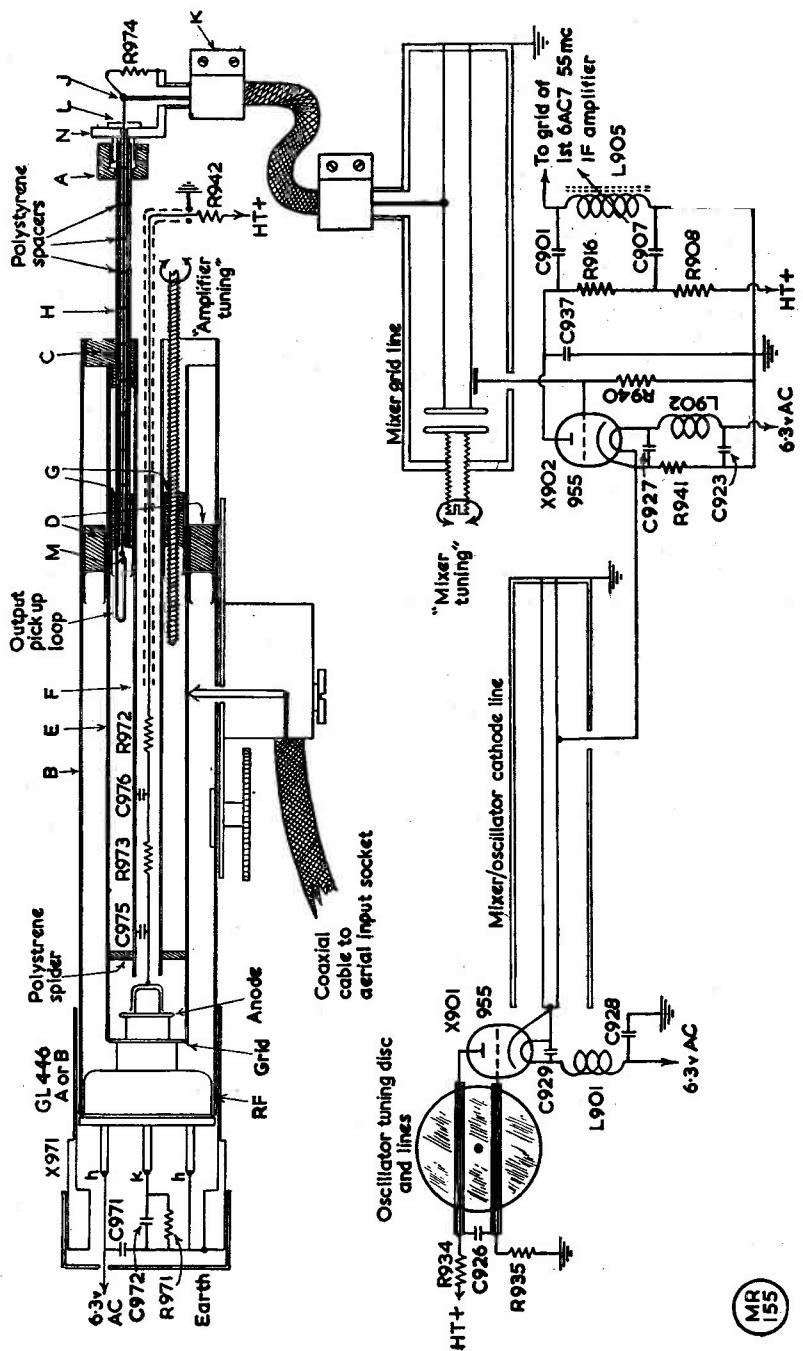


Fig. 1. This drawing is of the circuit of the RF stage, 1st oscillator and mixer prior to modification, with a sectional diagram of the RF stage. The reference letters will enable modification details to be followed. In this section, L905 and associated components are removed.

MR  
155

### Table of Values

**Fig. 1. Front End of the ASB8 before Modification.**

C901, C907, C923, C927	
C928, C971, C972	= 500 $\mu\mu$ F
C926	= 150 $\mu\mu$ F
C927, C929, C937	= 25 $\mu\mu$ F
C975, C976	Built-in bypass condensers
R908	= 56,000 ohms
R916	= 4,000 ohms
R934	= 12,000 ohms
R935	= 10,000 ohms
R940	= 100,000 ohms
R941	= 100 ohms
R942	= 4,700 ohms
R971	= 600 ohms
R972, R973	= 1,000 ohms
R974	= 680 ohms
L901, L902	Heater Choke, 36 turns on $\frac{1}{8}$ " dia.

through R902 (35,000 ohms) to pin D of the power socket, and was presumably to connect to a DC potential modulated at the frequency of supply. Following the 2nd mixer are two further stages of IF amplification at 16 mc using 6AC7's and a 6H6 diode detector. Finally, a video amplifier and a cathode follower both using 6AC7's—intended to feed a CRT presentation unit known in the surplus advertisements as the "ASB8 Indicator," and also a very well laid out and constructed piece of equipment.

The IF stages use single winding coils tuned by movable dust cores, and all are heavily damped by low value resistors giving a rather wide overall bandwidth.

### Early Experiences

The writer is inclined normally to frown on conversions of surplus equipment to satisfy amateur needs on the ground that in many cases so much is done to the unit in order to get worthwhile results, that the final article bears little resemblance to the original. In other words, a start from scratch might just as well have been made in the first instance, with very likely better results in the end. In the case of the ASB8 the rather superior and easily followed under-chassis layout, coupled with the fact that it was thought that once the RF section was in order, little else had to be done apart from fitting suitable audio stages, resulted in the "No modified surplus!" rule being overlooked for the first time.

It is thought, therefore, that a short account of earlier modifications and the shortcomings experienced will bring out the reasons for the more comprehensive changes made later.

When first modified a suitable potentiometer was fitted to vary the screen voltage of the two 55 mc IF

stages and an EA50 diode was fitted as the 16 mc detector. The 6H6 was rewired as a double-diode noise limiter and the two output stages were replaced by a 6SN7 as combined 1st AF and BFO, with a 6F6 as the output stage. The RF sections were altered as described later in order to tune the 70 cm band.

Modified thus, the receiver was in use for some considerable time at the home QTH, and produced good signals from the locals at some 5 miles distance using but a dipole in the roof space. It was noted that the noise limiter did not live up to expectation, presumably due to the wide bandwidth, and also that the 2nd oscillator on 39 mc produced an unpleasant 11th harmonic at 429 mc in the busy part of the band. The latter trouble was overcome by lowering the oscillator to 38 mc and retrimming the 1st IF stages to 54 mc.

Modified as above, the ASB8 was used during 1949 for 70 cm tests with the G3BUR/P team. Its sensitivity seemed quite good under field conditions but having now two or three S9 signals to cope with at the same time, we had great difficulty reading the weaker signals from those stations less fortunately placed; the more powerful signals simply poured into our IF bandwidth until it could hold no more! We worked all stations heard, but we were also heard and called by other stations whom we did not hear, presumably because of the above condition.

The writer determined to have a somewhat narrower bandwidth for the Magazine 70 cm contest week-ends, and so when G3BUR/P next performed on the first week-end of the contest the ASB8 had only one 1st IF stage, this time at 56.3 mc, followed by the two 2nd IF stages now lowered to 10 mc. The 2nd oscillator had been moved to 46.3 mc bringing both its 9th and 10th harmonics outside the 70 cm band, and the damping resistors had been removed across the 10 mc IF stages and replaced by chokes. This time we had trouble of the opposite variety—trying to keep the stations *inside* our narrowed IF bandwidth! It was still, incidentally, quite 50 kc wide at the half power points.

The second week-end of the contest told much the same story, when we worked three new arrivals on the band—all using SEO transmitters with their modulated carriers running in and out of our IF passband.

Since that day a few more things have been tidied up and the receiver now lines up as follows in anticipation of

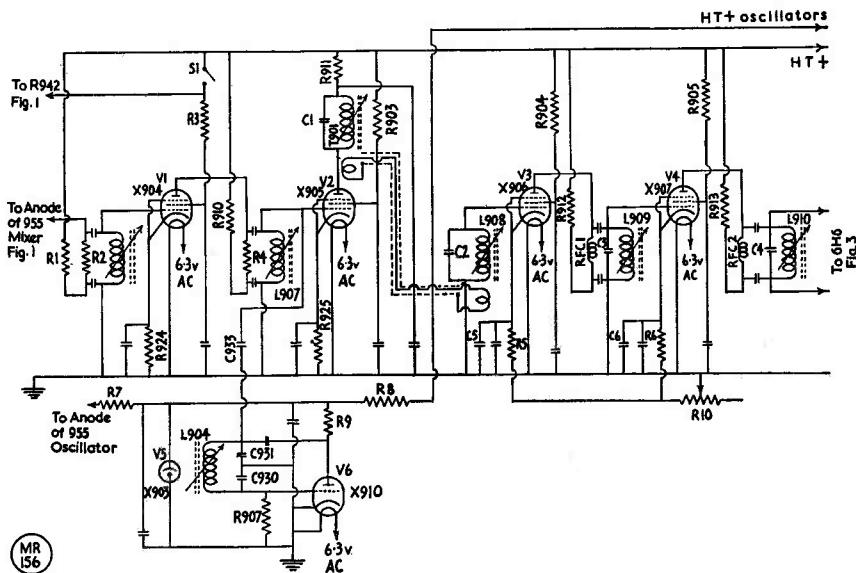


Fig. 2. The IF section of the ASB8 after modification. The original component numbering is used for ease of identification, new circuit elements only being designated in the C, R, L nomenclature.

### Table of Values

#### Fig. 2. The IF Section after Modification

C1	= 20 $\mu\mu$ F ceramic
C2, C3, C4	= 56 $\mu\mu$ F ceramic
C5, C6	= 0.1 $\mu$ F midget 150v
C930	= 50 $\mu\mu$ F
C931, C933	= 25 $\mu\mu$ F
All unmarked condensers	= 500 $\mu\mu$ F
R1	= 56,000 ohms
R2, R4	= 10,000 ohms
R3	= 47,000 ohms
R5, R6	= 300 ohms
R7, R9	= 2,500 ohms
R8	= 4,000 ohms
R10	= 2,000 ohms
R903	= 68,000 ohms
R904	= 47,000 ohms
R905, R907	= 56,000 ohms
R910, R911, R912	
R913	= 1,500 ohms
R924, R925	= 120 ohms
V1, V2	= 6AC7
V3, V4	= 6SK7
V5	= VR150/30
V6	= 6J5
S1	= SP on-off toggle
RFC1, RFC2	= 2.5 mH midget RF choke

more stable transmissions to come:-

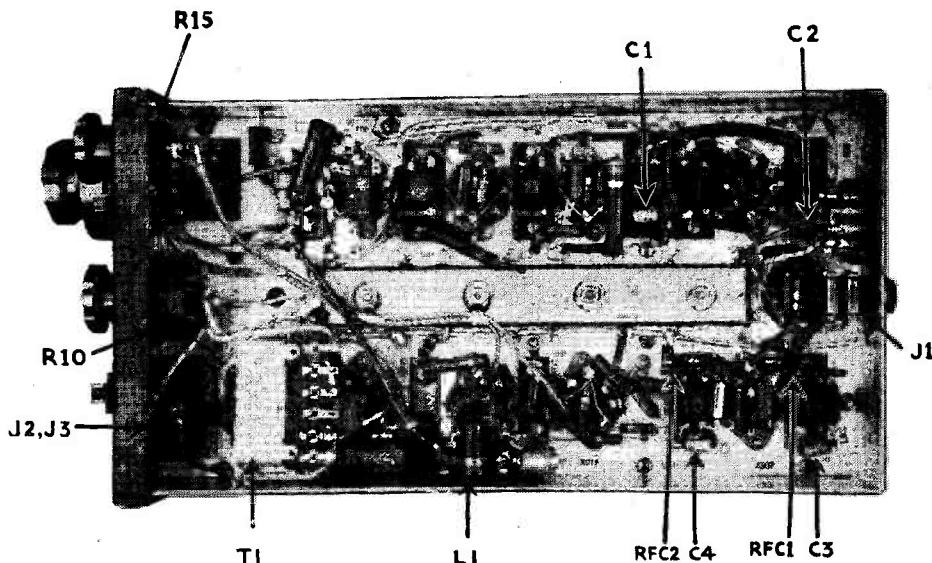
RF stage using GL446 lighthouse valve and tuning slightly more than 420-460 mc: 955 1st oscillator 56.3 mc on the high side of the signal frequency; 955 1st mixer, followed by one stage of 6AC7 1st IF at 56.3 mc: 6J5 2nd oscillator on 46.3 mc: 6AC7 2nd mixer

followed by two stages of 6SK7 2nd IF on 10 mc: 6H6 detector and noise limiter: 6SN7 as BFO and 1st AF followed by a 6F6 output stage; a VR150 stabiliser feeds the two oscillators which are allowed to run continuously, even when the receiver is switched to "standby".

With the 6J5 oscillator on 46.3 mc, its 9th and 10th harmonics cause no trouble, but other weaker spurious signals do occur due to harmonics of the 6J5 oscillator beating with the 955 oscillator fundamental and harmonics at certain settings of the latter to produce weak 10 mc beats. If the oscillators are lined up as recommended, only one of these, corresponding to a signal frequency of 443 mc, is heard when tuning through the band.

In referring to components throughout the modifications, use will be made of the notation adopted in the receiver itself, in which all parts are marked—R, C, X, L, and T, for resistor, condenser, valveholder, inductance, and transformer respectively—all of which have numbers in the nine hundreds. New components added for the purpose of the modifications to be described will be referred to as R1, R2, C1, and so on.

It would perhaps be as well to point out that the centre underside of the



**Underside of the ASB8, with positions of major new components indicated.** As in the original every circuit element is numbered and the under-chassis layout is particularly clean, there is no difficulty in finding one's way about it.

chassis is occupied by a by-pass condenser for HT positive and 6.3v. AC. Tags radiate from this condenser to feed the various stages, and care should be taken not to confuse these when modifying the wiring.

#### Modification to RF Stage

Fig. 1 shows a cross-section through the RF stage, which has two tuning controls—the grid-to-cathode input slide and the grid-to-anode output slide. The former is very "flat" in its tuning and is simply left in the lowest frequency position and locked. The output slide, on the other hand, is quite sharp and must be kept "on the nose" if weak signals are to receive the greatest benefit. Modifications to the output slide are necessary to get down to 420 mc. Two things are done to increase its travel at the LF end—a limit screw is removed from the end block, and  $5/16$  in. is turned off the slide at its "dead" end. The present screw adjustment on the front panel is replaced by a plain rod with a knob on the front panel, which is simply pulled out or pushed in as required. The output assembly to the mixer is also shortened

to prevent fouling the front panel. When handling the sliders great care should be taken not to damage their delicate contact fingers.

The above modifications are carried out as detailed below, reference being made to Fig. 1 when indicating the steps in dismantling.

Remove the GL446 valve from the coaxial assembly and unscrew the "Amplifier Tuning" lock right out. Unscrew the aerial input cable socket on the front panel, and unsolder and pull through the chassis the screened HT lead from the end of the RF tuner to R942. Unscrew the clamp and screws holding the RF tuner to the chassis and pull out the inner tube of the output assembly after slackening the nut A. The coaxial tuner should now be free of the main chassis and is dismantled in the following manner:—

Take out the screws securing the outer tube B to the end block C and carefully slide off the tube, having first slackened the knurled knob of the input slide. Slide off the aerial input cable assembly and the input slide D. Take out the screws securing the tube E to the end block C, and slide off this tube. Slacken

the grub-screws in the end block which told tube F and slide out the tube complete with the screened HT lead.

Disconnect slide G from the screwed rod and end block C. Carefully note the position of the locating slot in the outer tube H of the output loop assembly relative to the slide G and unscrew the tube. Protective tape should be wrapped round the fingers of the slide and  $5/16$  in. taken off its "dead" end—preferably in a lathe. The outer tube H is now replaced in the modified slider and  $\frac{7}{8}$  in. sawn off its end, after which it is re-slotted in the same relative position as observed above. The hole in the slider which originally held the screwed rod is cleared and tapped 4 BA. A length of  $5/32$  brass rod is tapped 4 BA at one end and fitted as the front panel tuning control. The hole in the end block is enlarged to take the brass rod, and the coaxial tuner is then re-assembled in the reverse order described above.

When shortening the output loop assembly, care must be taken when unsoldering connections not to damage the small polystyrene spacers in the inner tube. The junction of the coaxial lines and R974 are unsoldered at point J, the screws in clip K are slackened off and the coaxial cable pulled out. The polystyrene washer L is loosened, the inner wire is unsoldered at the output loop M and is carefully withdrawn complete with its polystyrene spacers. The angle piece N is then held in a vice or other suitable fixture, a hot iron is applied, and the tube is pushed through the hole until  $\frac{7}{8}$  in. projects when it is re-soldered; when cold, the projecting  $\frac{7}{8}$  in. is removed with a small saw and the new joint and hole are smoothed off. The inner wire and coaxial cable are then reassembled, R974 680 ohms being discarded.

The inner coaxial tube and loop are replaced in the outer tube projecting from the coaxial tuner, engaged in the slot and the nut A tightened. Finally, the coaxial tuner is remounted on the main chassis, thus completing the more "mechanical" side of the modifications.

#### Modifications to 1st Mixer and Oscillator

The 955 "Mixer Tuning" which appears as a screwdriver front panel control is fitted with a small knob, and will be found to tune the extent of the 70 cm band quite easily.

The 955 oscillator frequency is raised

to cover roughly 460-525 mc by moving the  $150 \mu\mu F$  condenser C926 approximately  $\frac{1}{2}$  in. nearer to the valveholder. The oscillator is used on the high side of the signal frequency. It might be thought better in the interests of stability and more constant output amplitude to lengthen the lines and run the oscillator on the lower side, but if this is attempted it will no longer be possible to cover the 70 cm band with the present tuning system and also the mixer/oscillator cathode line is no longer resonant near the oscillator frequency.

When C926 is unsoldered, care should be taken with its wire leads, as they break easily. The fitting of a useful dial in place of the present gearbox and handle is to be recommended. Some four turns of the tuning disc are required to cover the 70 cm band, and a dial of the type shown in the plan photograph is suitable. It has 0-100 divisions round its periphery, the number of complete revolutions plus the number of divisions on the dial being read off against the cursor. The oscillator tuning scale *versus* frequency graph is far from linear, being cramped at the HF end when the disc is near the lines, and well opened out at the LF end where movement of the disc has much less effect on the inductance of the lines. Front panel bracing struts fitted either side of the chassis help to improve the mechanical stability of the oscillator.

Recently, in order to have a more

#### Table of Values

Fig. 3. After-End Modifications to the ASB-8

C7, C15, C17	= $100 \mu\mu F$
C8	= $0.1 \mu F$ paper
C9	= $500 \mu\mu F$ mica
C10, C13, C20	= $0.01 \mu F$ paper
C11, C18	= $25 \mu F$ electrolytic
C12	= $0.5 \mu F$ paper
C14	= $0.001 \mu F$ mica
C16	= $3-30 \mu\mu F$ trimmer
C19	= $0.002 \mu F$ mica
R11, R12, R21	= 220,000 ohms
R13, R14, R15	= 1 megohm
R16	= 2,000 ohms
R17	= 6,800 ohms
R18	= 68,000 ohms
R19	= 560,000 ohms
R20	= 100,000 ohms
R22	= 4,700 ohms
R23	= 450 ohms
R24	= 3 ohms
V7	= 6H6
V8	= 6SN7
V9	= 6F6
L1	= 10 mc BFO coil ( <i>see text</i> )
L911	= Heater choke
T1	= Speaker output transformer
S2	= SP on-off toggle
J1	= LS jack with auxiliary contact
J2, J3	= Phone-jacks

orthodox condenser tuning arrangement for the 1st oscillator, further modifications have been carried out. Fig. 4 shows the acorn valveholder remounted on 1 in. pillars and  $\frac{1}{4}$  in. to the rear of its former position. New tuning lines of 14 gauge wire are fitted, the two-pillar terminal strip being fixed in the position shown and anchoring the bottom ends of the lines. The tuning disc assembly is replaced by an Eddystone  $15+15\mu\mu F$  split-stator condenser (reduced to one stator and one rotor plate per section) mounted in the centre of a  $2\frac{1}{4}$  in. square brass plate. It is necessary to remove a small portion of the chassis to accommodate the condenser. A  $1.5\mu\mu F$  ceramic condenser is shunted across the split-stator condenser in order to limit its tuning range and prevent opening out of the tuning scale at the HF end. With a little ingenuity, a Muirhead edgewise graduated slow-motion dial can be fitted on the front panel. Connection between the split-stator condenser and the lines is made with 22 gauge wire to allow movement for setting up purposes, and it will be found possible to position these leads and the  $150\mu\mu F$  ceramic tube condenser to give an oscillator tuning range of 363.7 to 403.7 mc, thus tuning 56.3 mc on the low side

of the signal frequency. The above tuning system gives a more linear frequency *versus* dial reading curve, but mechanical stability is still not all that could be desired.

#### Modifications to Main Chassis

The front panel presents quite a small area on which to accommodate a multitude of controls. The following arrangement results in the most being made of the space available. The "Sens. Sw." and "Power Supply" sockets are removed and the holes are filled in with square plates. Two potentiometers of 500,000 ohms and 2,000 ohms are fitted in the centres of these plates, being the AF and IF gain controls respectively. The "Video In" and "Rec. Out" sockets are removed and two headphone jacks fitted—very essential on field days when the crowd gathers! The aerial input socket being a non-standard size is replaced by a double-ended Pye plug, Pye cable sockets being fitted to the internal receiver cable and the aerial cable. Continuity of the outer screen of the coaxial cable is thus maintained through to the coaxial tuner. The plug and sockets should have polystyrene or similar insulation, it being possible to

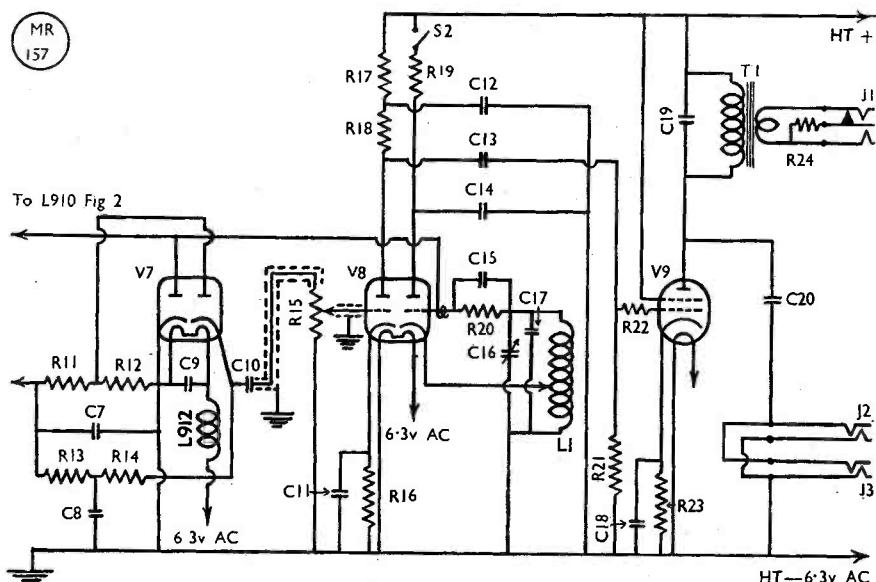


Fig. 3. Detector, noise limiter, BFO and audio stages as applied to the ASB8 to make it a receiver complete in itself.

dispense altogether with insulation in the case of the double-ended panel plug. Two  $15/32$  in. dia. holes are drilled in the front panel above the oscillator tuning dial, and the SP on-off toggle switches fitted are used for "Standby" and "BFO on-off" controls. On the rear wall of the chassis the locating spike and its bracket are removed (the bracket will break off at the welds), and an Igranic jack fitted for loud-speaker connection. A hole alongside carries a Belling-Lee socket to bring in the necessary supplies from an external power pack. In case the receiver has to be operated in inclement weather (such as one often finds on field days!), it is a good idea to have suitable holes in the rear of the cover to coincide with the above-mentioned jack and socket.

L905, X903 and all components associated with the 1st 55 mc IF stage are removed, and X903 is remounted on  $\frac{1}{4}$  in. pillars sub-chassis, so that the VR150/30 will clear the top of the cover.

All the components and wiring to X909, X908 and X911 are removed with the exception of heater and earth leads on X909 and X911. C934 between X908 and X911 is replaced by C936, and a small loudspeaker output transformer is mounted between X909 and the front of the chassis. The BFO coil shown mounted on the side wall of the chassis above X908 was taken from a 12 mc IF strip and padded down, the dust core being removed. Alternatively, the former of L905 could be re-wound and fitted between X911 and L910, the mounting holes being already drilled. The BFO coil could then be slug-tuned from the top of the chassis, which would possibly be more convenient than the Philips preset condenser mounted underneath.

A study of Fig 2 in conjunction with the appended Table of Values and the photograph of the underside of the chassis should make the circuit changes fairly obvious as far as the IF and 2nd mixer stages are concerned. The following points require further explanation, however.

L908 has 2 turns removed from the bottom of its winding and has a separate 5-turn coupling coil (of similar gauge wire) added below the main winding. This latter coil is connected to the similar coil already on T901 by a short length of  $\frac{1}{4}$  in. coaxial cable. In the interests of HF insulation and low capacity, the lead between the anode of the 955 mixer and L906 is made from

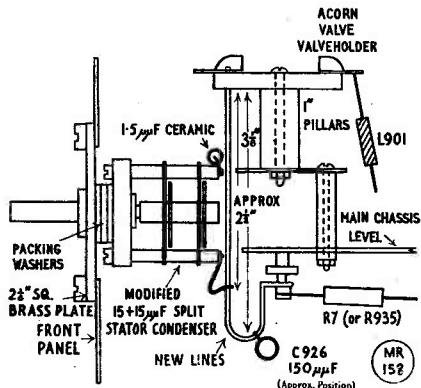


Fig. 4. Modifications suggested to 1st oscillator stage to enable condenser tuning to be used.

the centre of  $\frac{1}{4}$  in. dia. coaxial cable, the braided screen and outer covering being discarded. RFC<sub>1</sub> and RFC<sub>2</sub> are miniature 2.5 mH chokes, and consequently have a small external field. If the more common size of 2.5 mH choke is used, it may be necessary to orientate the chokes to give minimum coupling, or even fit a small screen across X907, to prevent oscillation in the 10 mc IF stages.

The circuit of the detector, noise limiter BFO and audio stage is shown in Fig. 3. Little difficulty should arise here, a certain amount of latitude in the values of the audio components being permissible and very likely dictated by the "stock in hand." The output transformer primary forms the load for the shunt fed 'phone jacks when the speaker is not being used, the LS jack being arranged to switch a 3-ohm resistor across the transformer secondary.

It will be noted that the standby switch breaks the HT feed to the RF stages and also the screen of the 56.3 mc IF amplifier. In some cases circumstances may dictate that other stages are deprived of HT during standby periods, as might well be the case during portable operation, when perhaps one HT supply has to suffice for transmitter and receiver. In such a case it is advisable to minimize drift by at least maintaining the HT feed to the two oscillators. For this reason, the VR150/30 HT line is brought out to a separate connection on the power socket.

It should also be noted that the heater requirements are 6.3 volts at 4.5 amps, and it is essential that the voltage at

the centre by-pass condenser tags be a genuine 6.3v, otherwise sensitivity will suffer. When operating portable from accumulators, a well-charged high capacity battery is required if it is contemplated operating the receiver for long periods. HT requirements are 110 mA at 250v. Good earthing of the metal valve envelopes, particularly the 6J5 oscillator, through the spring clips provided, is essential for complete stability in the IF section.

### Lining Up Procedure

The use of a signal generator or oscillator capable of providing frequencies of 10 and 56.3 mc is more or less essential in order to get the IF circuits lined up correctly. If a modulated signal is available, the output indicator can be an AC voltmeter plugged in the headphone or loudspeaker jack. If the signal is unmodulated a 0-1 mA (or less) meter in series with the diode load will give a suitable indication.

The circuits should be lined up in the following manner:—

- (a) Set the IF gain control at maximum sensitivity and inject 10 mc between the grid of the 6AC7 2nd mixer and earth. Trim L910, L909, L908, and T901 in that order for a maximum deflection on the output meter reducing the generator output as necessary. Close the BFO switch and tune BFO coil for an audible beat note.
- (b) Switch off the BFO and inject 56.3 mc between the grid of 955 mixer and earth. Trim L907, and L906 in that order for a maximum on the output meter, reducing the generator output as necessary.
- (c) Repeat (a) and (b) for the inevitable "final-final."

### Operation of the Receiver

The fact that the RF, mixer and oscillator all have separate controls does not exactly make for ease of operation after handling the usual ganged tuned jobs on the lower frequencies. The unorthodox RF tuning at first tends to come in for much under-the-breath criticism. After hearing the first signals and realising that the RF stage really pulls its weight, such criticism is short lived and one soon gets the knack of tuning a single-ended stage under "push-pull" conditions!

The mixer tuning will be found to require only a turn or so when going from one end of the band to the other. The main difficulty at first will, no doubt, be knowing just when the three tuning controls are synchronised and keeping them so whilst exploring the band. There is a slight rise in background noise when all three are brought into step, but this may be difficult to

recognise at first. In the absence of signals, the writer recommends the use of what, for want of a better name, will be called a "noise generator" located near the aerial. Such a machine at the writer's QTH was provided by the small beam rotating motor. Heavily suppressed at the motor with six chokes and various condensers to well below the back-ground noise on 2 metres, it was found, rather surprisingly, to give out S9 signals on 70 cm. This noise generator proved indispensable for the first week or two with the finally-modified ASB8, but is now unwanted QRM, the writer being adept at keeping the tuning controls in step quite satisfactorily on the slight rise in back-ground noise. Using an all-triode RF section, it should be slight anyway! It might be mentioned that an aerial loosely coupled to the 955 mixer anode (through a blocking condenser) will usually result in auto QRM being picked up with great gusto, and gives a rough check on the sensitivity of the IF channel, even if it doesn't exactly sing the praises of the noise limiter!

### General Results

Modified and lined up as described, the ASB8 is capable of receiving signals which are reasonably frequency stable under modulation. It has not yet been possible to do a full check on the performance when receiving CW signals, such transmissions being rather rare in the writer's vicinity. In areas where SEO's are still the rule rather than the exception, it may unfortunately be necessary to widen the band-width by slightly staggering the tuning of the 10 mc IF coils. If one is in the position politely to request the offender to reduce his modulation to 20 or 30 per cent., this will usually serve the same purpose and enable intelligible speech or MCW to be received. The poor SWL, however, has only one choice if he wishes to decipher the swishings back and forth through his IF passband—widen it! It is to be hoped that SEO's will soon give place to more stabilised systems of transmission, enabling receivers with reasonably narrow IF band-widths to be usefully employed in exploring the possibilities of 70 cm. The writer's opinion is that, even for copying crystal-controlled transmissions, a band-width of 20-25 kc in the IF circuits is still advisable. This statement is based on observations made on 2 metres where it has been noticed that quite a number of transmissions drift a few kilocycles

during a contact lasting perhaps 5 minutes. Stable 70 cm rigs will no doubt start in their early stages with crystals of the 6, 8, or 12 mc variety, as used on 2 metres, and very likely will lead to drifts of some 10-20 kc when multiplied into the 70 cm band.

Although the writer has confidence in the ability of the ASB8 to show a clear

pair of heels to many of the receivers at present in use on 70 cm, there is no doubt that still better use can be made of the RF circuits as a basis for the 70 cm receiver *par excellence*. When time permits, this is the next step towards attaining a similar order of receiver sensitivity and ease of handling as that at present enjoyed on 2 metres.

## PRACTICAL SUPER MODULATION

### Circuits and Values for the Communication Bands, Setting Up and Operation

By F. C. JUDD (G2BCX)

**T**HE system to be described, and known as Super Modulation, should not be confused with somewhat similar systems of efficiency modulation. Basically, it is the derivation of a system due to Doherty (*Ref. 1*), later developed by R. E. Taylor (U.S.A.) for commercial purposes and for certain broadcast equipment used during the last war (*Ref. 2*). After several years' delay in presenting this new method to the industry, development has brought the practical application at a time when an improvement is seriously (*Ref. 3*) needed in the amateur and other spheres of communication service. Many experimental transmitters have been constructed using this new system, and the writer has used super-modulation on three different transmitters working on 20 metres and 160 metres with power inputs ranging from one watt to a hundred watts, details of which will be given later.

#### Advantages of Super Modulation

Super-modulation makes use of emphasised sidebands and semi-suppressed carrier transmission and provides far greater signalling efficiency than was previously considered possible. With more than four times the true sideband power at full modulation, and one half or less than the band-width required in conventional amplitude systems, transmission efficiency is about equal to that claimed for single side-

*This is a very useful article on the practical application of Super Modulation and takes matters several steps further than the preliminary discussion on the same subject in our October issue. G2BCX describes two experimental layouts, full power and QRP, and the treatment is detailed and factual.—Editor.*

band methods—and in some operational respects it is superior. Fifteen to twenty times or more peak power output at full modulation, with a band-width of two to three kc each side of the carrier, without spread or splatter, is obtainable. Conventional systems are limited to four times or less than peak power. With compression of the *carrier power* under full modulation, the sideband power is driven upward to a high level output, resulting in a reduction in heterodyne interference and noise level at the receiving end. The greater signal voltage out of a linear detector results in 6 dB or more gain over a normally modulated transmission. The first difference that will be noticed is that a super-modulated signal is extremely sharp to tune and, at the same time, is far "louder" than any amplitude modulated signal of the same effective field strength. Further, at the receiving end when the BFO is switched on, the carried heterodyne is barely audible, and in many instances possible interfering heterodynes are not heard at all, except from very local transmitters. Speech quality is quite equal to normal amplitude-modulated transmissions. Tests made with two one-kilowatt transmitters, both super-modulated, and operated 2.5 kc apart, using full modulation for maximum sideband power production with the S-meter on the receiver "pinned" by both signals, showed that

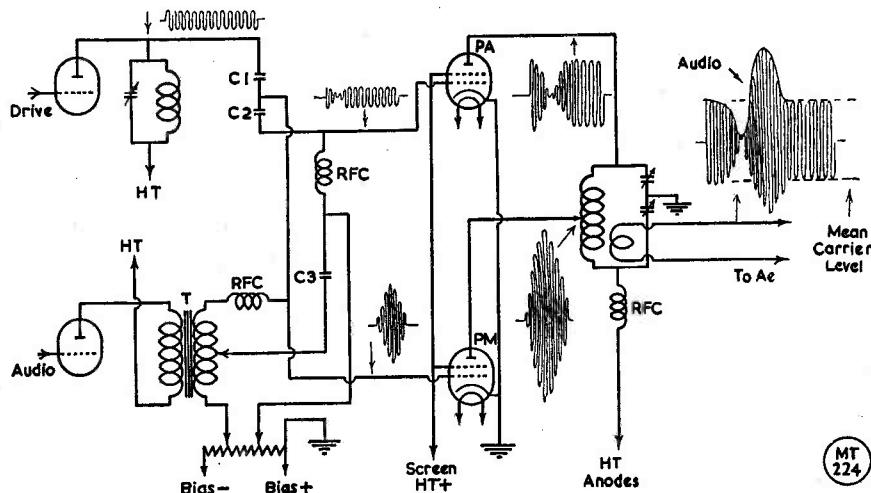


Fig. 1. Basic circuit for the Super Modulation system, showing how the output waveform is built up.

either transmitter could be tuned-in as desired without interference from the other. The system has also the following advantages:—

- (1). Considerable reduction in BCL and TV interference. In the case of the writer's transmitter operating on twenty metres with 100 watts input and super-modulation, no interference to nearby televisions was experienced, or on a BC receiver on medium waves some 10 feet from the transmitter; this was unscreened and without harmonic traps in either the drive or PA stages. With conventional amplitude modulation to the same transmitter, either anode or cathode, TVI and BCI are reported.
- (2). The audio power fully to modulate 1 kilowatt is only about 8 watts. In the case of the writer's 100-watt transmitter mentioned above, the output from a 10-watt amplifier with one quarter of the gain required for normal anode modulation on a 10-watt transmitter was found to be more than sufficient; in fact, a maximum audio output of from 3 to 5 watts is all that is necessary for a 150-watt carrier input.

### Theory of Operation

Sideband power alone, irrespective of how it is generated, is that part of the transmitted carrier wave which conveys speech to the receiver at a distant point. Thus, the greater the true sideband power produced by the transmitter, the stronger the received signal and the lower the interference level, especially if the carrier can be suppressed during modulation, a feature which decreases the heterodyne interference between stations operating only two or three kc apart. Also, if the sideband power is a

true reproduction of the modulation, the band-width required is about one half of that necessary with the usual high modulation percentages and their attendant distortion, phase shift, and splatter. Theory shows that a true two and a half kc modulation frequency produces sidebands two and a half kc removed from the carrier, whereas in practice harmonics and distortion usually produce sidebands five to ten kc or more away from the carrier. The basic function of super-modulation is shown in the pictorial diagram in Fig. 1, which represents a conventional PA adjusted for maximum output. Bias, drive and tuning are as for any normal Class-C amplifier. The RF drive power is

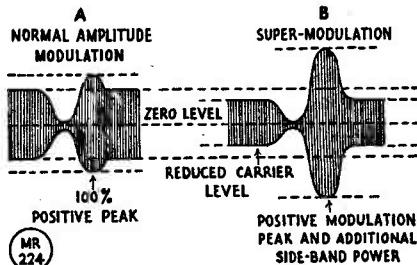


Fig. 1 (A). The shape of a normal amplitude modulated carrier. (B) Super modulated output waveform.

applied through  $C_1$  and  $C_2$ , which provides an RF potential divider to the grids of the PA and the Positive Modulator (PM). Thus, both valves have RF applied to their grids, the PM valve having twice that of the PA. The audio power (best referred to in terms of voltage) is also applied to the grids of the PA and PM respectively, the PA having half the amount of that to the grid of the PM. It will be seen that the audio transformer, which is centre-tapped at the secondary, will provide the necessary halving of the audio volts which, in the case of the PA, are passed through the condenser to  $C_3$ , which also isolates its grid from the bias applied to the grid of the PM and which goes directly through the transformer. The PM is biased to approximately two to three times cut-off so that, with RF drive applied, the valve takes little or no current and allows the PA to be tuned-up in the normal way.

With modulation applied, the standing bias on the PM will be overcome and the valve allowed to pass current and

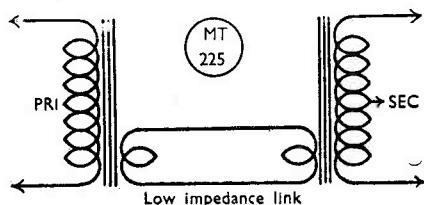


Fig. 2. Method of coupling two small transformers back-to-back; if the transformers are similar electrically, with low impedance windings of the same value, the ratio overall will be approximately 1:1.

amplify, the result being a very large positive peak wave at the anode. Since the anode of the PM is taken to the centre of the PA anode load (tank coil), an RF step-up through the auto-transformer action of the tuned circuit will also result.

Now to return to the PA. With the valve already working under Class-C conditions, positive-going modulation voltage applied to the grid will have no effect on its operational condition; but, with negative-going speech voltage, the grid will be driven more negative, resulting in a reduction in anode current and therefore a reduction in RF output. In other words, the PA is producing decrement or negative-going modulation peaks (carrier suppression) while the PM

is producing positive-going modulation peaks (increased sideband power) superimposed on the carrier; this remains at normal amplitude over the period of positive modulation. Under proper operating conditions, the PA output is reduced almost to zero during the negative modulation period. The resultant modulated RF output is shown pictorially in Fig 1 and also in Fig 1A, which shows a comparison with an amplitude modulated carrier of normal type.

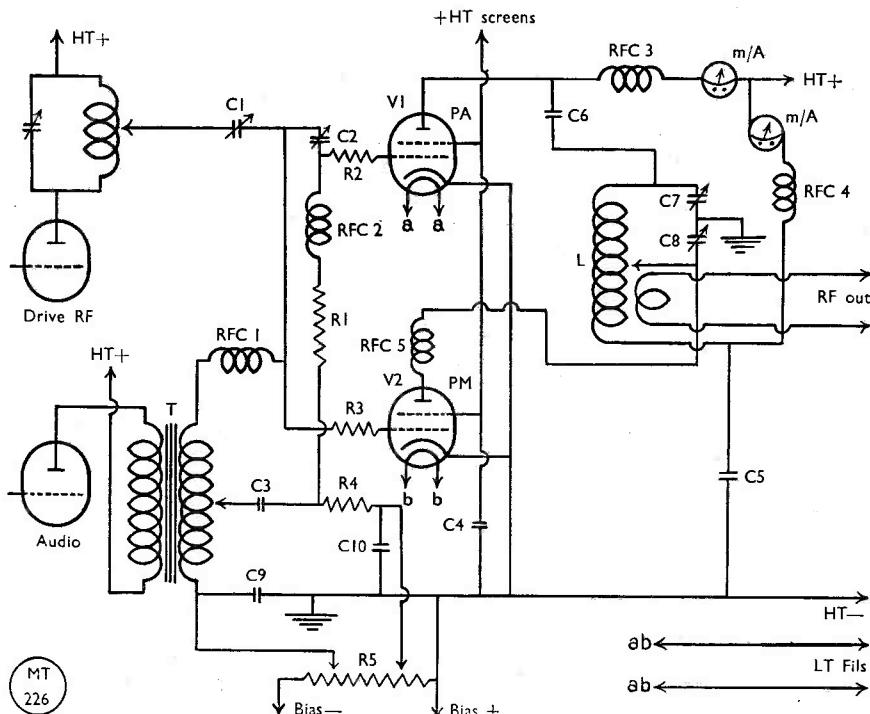
Further advantages of the system are that no large modulator/speech amplifier equipment and power supplies are needed and no expensive modulation transformer is required, since accurate matching of modulator to transformer is no longer necessary. A small amplifier with a maximum of 4 to 5 watts output is ample for up to 150 watts input to the PA, and the transformer needs only to match the audio output valve and have a centre tapped secondary and a ratio of 1:1. In the writer's transmitters, two speaker transformers are coupled back-to-back, with one having a centre tapped primary, which becomes the secondary winding of the system shown in Fig. 2.

#### Practical Circuit for Super-Modulation

A practical circuit is shown in Fig 3 and can be used for any of the conventional types of RF tetrode—6V6, 807, 813 and similar. The drive stages must be able to deliver sufficient RF for normal Class-C operation of the PA, with a little in reserve for the positive modulation period. For example, the RF output from an 807 buffer with 500 volts or so at the anode will be enough to drive, say, an 813; or at reduced input, say 300-400 volts, would drive another 807 operating at maximum conditions plus an 807 as the positive modulator.

The RF potential divider condensers  $C_1$  and  $C_2$  are best if of the variable pre-set airspaced type, as control over the drive to either the PA and PM allows for better adjustment of the super-modulation condition. The audio input, as already mentioned, is fed through a 1:1 transformer centre tapped at the secondary, so that half the audio voltage may be applied to the grid of the PA through the  $2\mu F$  condenser  $C_3$ , which isolates the PA bias from the PM bias.

The circuit shows an RF drive, audio and bias arrangement similar to that in Fig 1. The bias supply should have



**Fig. 3.** Practical circuit for a Super Modulation system, as used by G2BCX and discussed in the text. All necessary values appear in the table.

sufficient DC voltage output to bias the PM valve to approximately three times cut-off, and must be well regulated and smoothed. The 50-100,000 ohm wire-wound potentiometers are best mounted on the front panel of the transmitter to provide manual control, and must be of high enough power rating to carry the current passing at maximum voltage across them. Good-quality RF chokes are advisable for the grid circuits of the PA and PM, and apart from the centre tapped coil, all adjustments and tuning for the PA are as for a normal Class-C amplifier. The PM valve will add a little capacity to the tank circuit, and it may be necessary to reduce the tank inductance slightly, especially at the higher frequencies. A study of the circuit will show that the modifications necessary to convert a normal PA stage for super-modulation are very simple, and, providing the few components required are of the correct value, little trouble will be experienced in getting the system operational.

#### Table of Values

**Fig. 3. Circuit Complete for Super Modulation Working.**

C1, C2	.0002 $\mu$ F
C3, C9, C10	2 $\mu$ F
C4	0.1 $\mu$ F
C5, C6	.005 $\mu$ F
C7, C8	100 $\mu\mu$ F per section
R1	2,000 ohms, $\frac{1}{2}$ -watt
R2, R3	50 ohms, $\frac{1}{2}$ -watt, anti-parasitic
R4	5,000 ohms, 1-watt
R5	Grid bias divider (see text)
T1	1 : 1 ratio transformer (see text)
RFC1-4	Standard Tx type RF chokes
RFC5	Anti-parasitic choke, 5-6 turns, 3/8-in. diam.
L	Centre-tapped inductance suitable for band to be used
PM	Positive Modulator
PA	RF Power Amplifier

The screen voltage to the PA and PM must be well regulated and preferably taken from a separate supply. Much greater control over the whole system will be possible if the RF drive, bias and screen volts are variable. (Over)

### Setting Up

Switch on filaments and grid-bias volts and apply RF drive. Check that bias is correct for Class-C operation of the PA valve to be used. Check bias volts for the PM, which should be enough just to cut the valve off with RF drive on the grid and with HT on. The grid current for the PA should be normal, and this stage may be tuned in the usual way for dip and aerial loading. Adjust bias on the PM valve until it just starts to draw and, with modulation applied, this valve will take current, which should swing up to almost the maximum rating for the valve in use, e.g., for an 807 with about 600 to 700 volts at the anode the current should rise to approximately 90-100 mA. The PA valve anode current will, at the same time, decrease, but the aerial current will rise by the same amount as for normal amplitude modulation.

If these conditions are not forthcoming, adjustments to bias, audio and RF drive volts will be necessary until the system is properly operating. All tuning and modulation adjustments should be carried out on an artificial aerial designed to match and load the PA to its normal operating condition, and only when the operator is satisfied that the whole system is working correctly should the transmitter be connected to an open aerial.

Modulation may be checked in the usual way with a diode phone monitor or modulation meter, and with a sine-wave input to the modulator, checks may be made with an oscilloscope, which will show the positive going modulation peaks at full amplitude. Make sure, above all, that the drive and PA stages are perfectly stable before attempting to use super-modulation.

### Results Obtained

It has already been mentioned that the writer has used super-modulation on three different transmitters with inputs of from one watt to one hundred watts, and the results have been all that are claimed. On 20 metres with an 813 PA running at 100 watts input, tests were carried out using an 807 as the positive modulator; with an anode voltage of 700 to both valves, and the 813 taking just under 150 mA with the PM (807) drawing about 5-6 mA, a total input of 108-110 watts was obtained. Reports of S9-plus from PY, LU and similar distances were consistent, and no trouble was experienced from QRM. Speech

quality was equal to that from the same transmitter using normal amplitude modulation.

On 160 metres some tests were made using two 807's with 300 volts at the anodes and inputs varying from one to ten watts. It was found, however, that 807's with this anode voltage gave best results with reduced anode current to the PA (higher bias and less drive) with the PM biassed almost to cut-off under drive condition. A better valve would be the 6V6G or TT11, where the power input is limited to 10 watts. Some notes from the tests made with super-modulation on 20 metres using an 813 as PA and an 807 as PM with reduced input to the 813 (100 watts) may be of interest to those who may contemplate trying the system. The following applies, in some respects, to a circuit using similar valves for PA and PM.

- (1) The grid drive to the PA needs to be just sufficient to operate the valve around Class-C conditions. Then adjust bias for a little below the normal grid current, when the transmitter is tuned and loaded.
- (2) The anode tap for the PM was tried nearer the PA anode end of the tuning coil with no improvements in results; the centre tap is optimum.
- (3) Plenty of drive required to the PM and this valve biassed to slightly above cut-off under drive conditions.
- (4) Distortion and broken speech are indications of *too much* drive to the PA and too little bias to the PM. If the PM is over-biassed then low modulation and distortion will result, and aerial current will drop on modulation peaks.
- (5) Aerial loading will affect the condition of super-modulation and must be correct for the PA valve in use, and an important factor is good regulation of the bias and screen volts.

### QRP Operation

Later experiments with an entirely battery-operated 160-metre transmitter using two DL93's (special 1.4v. transmitting valves) for the PA and PM proved extremely successful. The transmitter, together with a superhet receiver, was in one case 12 in. x 9 in. x 8 in., which also housed the batteries. A PM22A triode, operated as a Hartley oscillator/VFO and a Pen25 buffer amplifier provide more than sufficient RF drive with approximately 100 volts HT on the anodes of both valves, the PA and PM being operated with 150 volts HT (maximum for this type of valve). The PM was biassed nearly to cut-off with drive applied (67½ volts) with the PA at Class-C condition (20 to 30 volts-bias). Using short aerials 20-30 feet indoors and/or loaded whip aerials and operated from a car, good reports were obtained with inputs of from half to one-and-a-half watts to the PA.

Using a normal quarter-wave 160-metre aerial, signal strength and speech quality were approaching that of a normally modulated 10-watt transmitter. The PA and PM part of the circuit used on this little transmitter is shown in Fig. 4 and is a variation of the circuit of Fig. 3.

This may interest those who are keen on QRP and portable phone operation. The circuit shows a similar RF drive, audio, and bias arrangement to Fig 3, and the PA and PM anode circuit is the only difference with the original. It will be seen that HT to the PA anode is fed through the tank coil, and therefore the anode current meter is common to both PM and PA valves. By arranging for the meter to read about half scale for the PA current, it will then cater for the additional current taken by the PM on positive modulation, which is about half as much again as that showing for the PA. The audio volts were obtained from the LF end of the receiver, namely,

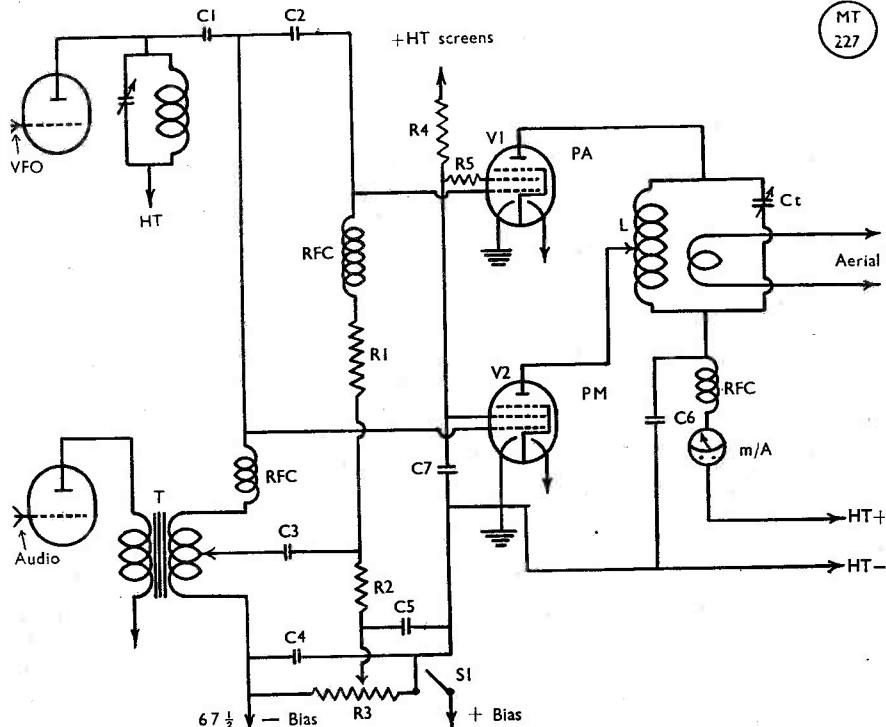
a DAC32 diode/triode and a DL35 output tetrode (1.4v. valves). The microphone was arranged for switching to the DAC32 grid for transmitting, the audio output from the DL35 (about 250 milli-watts) with 90 volts HT being ample for full modulation.

When properly operating, super-

#### Table of Values

**Fig. 4. Circuit for QRP Super Modulation Working on 160 Metres**

C1	= 350 $\mu\mu$ F
C2	= 160 $\mu\mu$ F
C3	= 2 $\mu$ F
C4, C5	= 0.5 $\mu$ F
C6	= .005 $\mu$ F
C7	= 0.1 $\mu$ F
Ct	= 200 $\mu\mu$ F for 160 metres
R1	= 2,000 ohms, $\frac{1}{2}$ -watt
R2	= 5,000 ohms, $\frac{1}{2}$ -watt
R3	= 100,000 ohms
R4	= 12,000 ohms
R5	= 47 ohms
T	= 1 : 1 ratio transformer
L	= For the band
V1, V2	= DL93



**Fig. 4. Circuit used for QRP battery-operated transmission, applying Super Modulation. G2BCX has tested this arrangement on the Top Band, and the table gives values for 160-metre working.**

modulation is far superior to any other form of amplitude modulation, and has already been mentioned as a method not only of reducing the QRM on our overcrowded bands, but it is also an economical system due to the great savings on audio equipment and power. Further experiments are being made with an expanded form of super-modulation, with which it is possible to

obtain a gain of 12 dB or more on speech power, and which is being used on a transmitter for 160 metres with an input of 8-10 watts.

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- Ref. 2. R. E. Taylor. Taylor Valves. U.S.A.
- Ref. 3. *Radio News*. U.S.A. publications & *Short Wave Magazine*.

## WHAT THEY ARE TOLD ABOUT US

### Translated Extracts from an Article in the Czechoslovak *Krtake Vlny* on Amateur Conditions in Britain

"**Q**UITE a considerable number of people in Britain have an interest in radio, but only a very small number transmit and receive on amateur wavelengths. That is because collective (club) transmitters do not exist where enthusiasts could work in that way except in military Fascist units. There are very few exceptions, and in military units it is forbidden to contact amateurs. The State discourages amateur activities . . . and as a valve is very expensive, it takes a long time before an average amateur in Britain can have even an o-V-o receiver."

" . . . The reactionaries [British authorities] are trying to use the insufficient advantages which the amateur in Britain has, so that they can paint rosy pictures of the advantages they will give to the radio enthusiast who enlists in an Army unit. . . I do not know a single working-class man in Britain who would be on an amateur organisation or committee. In the Midland Amateur Radio Society sits the reactionary element (*here follow some uncomplimentary references to M.A.R.S. and certain of its leading members*). . . There are amateurs who know Morse and radio technique to whom the authorities deny a licence. . . The club stations which exist are exclusively for closed circles and bribery."

" If a schoolboy transmits without a licence and is reported to the local agents of the M.I.5 (British Gestapo), then after a trial, which is conducted in Fascist style, he can be taken away from

his parents . . . into a concentration camp for children . . . in the camp he is imprisoned for three years, and until recently it was still legal for him to be flogged, and tortured in other ways . . .

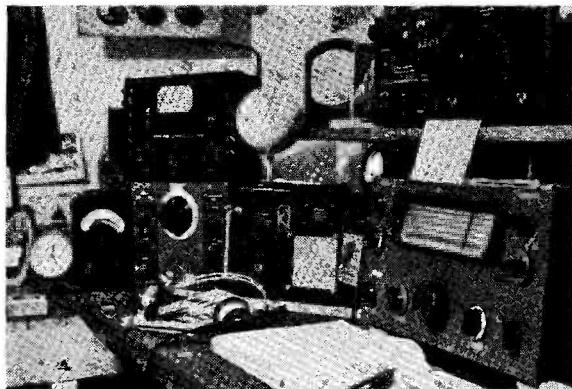
. . . As in other endeavours, there are two sides—one black reaction, Fascism and war; the other for progress, science and peace. It is the duty of every amateur to decide to which to belong. One side is for the destruction of all decent amateur activities and for using knowledge of electronics for war, the other serves the future of the whole radio amateur society . . ."

*EDITORIAL NOTE : The author of the article from which these extracts are taken is given as one Alexander Bergol, with an address in Erdington, Birmingham, and the English-Czech translation was by OKIRW. The article is important only because it is an example of what Czech amateurs are apparently being led to believe about Amateur Radio in this country. In the light of such stuff, we might perhaps refer those of our readers who have views on these matters to the Editorial in the September 1950 issue of SHORT WAVE MAGAZINE.*

#### CARD IN THE BOX

We are holding card(s) for the stations listed below. Please let us have a large S.A.E., with name and callsign, addressed to BCM/QSL, London, W.C.1, and cards will be forwarded on the next G clearance. If appearance in "New QTH's," and subsequently in the *Radio Amateur Call Book*, is also desired, this should be mentioned at the same time.

G2AJJ, 2FMZ, 2YF, 3AEO, 3CAD, 3CCR, 3CQH, 3CRA, 3DVB, 3ERE, 3FGM, 3FHR, 3FWH, 3FKS, 3FXK, 3GBU, 3GHM, 3GHZ, 3GRU, 3GSY, 3GXB, 3ZT, 4AF, 5YL, 6PW, 6SP, GD3GAB, GW3DHY, 3EPF, 3FEQ.



**DX**

# COMMENTARY

CALLS HEARD, WORKED & QSL'd

**I**N spite of the continuation of shocking conditions (see our P.S. to last month's "Commentary"!) the DX addicts have been hard at it throughout the month, and much of the usual addition and subtraction of countries has taken place. All those who hopefully added YA2B to their lists last month may now subtract him again, as cards addressed to him have been returned "not known." Further, the slight air of authenticity lent to him by his "Pse QSL via W2SN" disappears when we recollect (as we should have done last month) that W2SN runs the W2 QSL Bureau!

So our present pronouncement is that there never *has* been an amateur station in Afghanistan (other than the portable of AP5B) and that we flatly refuse to believe that anyone has worked Afghanistan until we see a card confirming it. (And even then, it had better be good).

In much the same category comes this "HV1A"—G3CDG (Lingfield) has had a letter from the Director of Vatican Radio who says that the Vatican authorities have never licensed anyone for amateur operation, and, if they did, it would not be with the prefix HV. The Director's own suggestion is that "HV1A" is an amateur outside the City who has "usurped the call" and is thereby "running the risk of coming

**By L. H. THOMAS, M.B.E. (G6QB)**

within the sanctions provided for by the law." So that seems to be that.

As slight compensation for these sad affairs, we are glad to note that a new Monaco station, 3A2AB, has cropped up. This is being operated by DL4FS and DL4UI (QSL *via* DL4 Bureau). 3A2AB told us very definitely that they were the first and *only* station to be legally operated in Monaco. Even 3A1A, who was on recently, emanated from Heidelberg and was never in Monaco at all. Proof of this, we are told, will be forthcoming shortly.

#### Competitive Stuff

We still continue to receive bitter tirades on the subject of the vaguely-proposed reform in the way of counting countries, prefixes, and what-have-you. Let us hasten to mollify the writers by telling them that we haven't the faintest intention of interfering with the present system which, with all its faults, is at least known and understood.

We also receive letters saying that this "intense competitive spirit" is ruining Amateur Radio, which ought to be a leisurely and friendly hobby. This is all very well, up to a point, but it seems to us that if it weren't for the competitive side we would still be using LS5's and

## FOUR BAND DX

Station	Total Score	3.5 mc	7 mc	14 mc	28 mc	Countries
<b>W2QHH</b>	445	73	72	196	104	197
<b>G3ATU</b>	396	27	80	189	100	196
<b>G2VD</b>	352	28	62	163	99	170
<b>G2WW</b>	349	21	53	170	105	181
<b>G2AJ</b>	337	21	54	169	93	185
<b>G5FA</b>	320	21	95	135	69	147
<b>G3FNJ</b>	280	24	46	118	92	145
<b>G6BB</b>	259	27	61	119	52	133
<b>G8PW</b>	241	15	60	108	58	122
<b>G2BJY</b>	240	4	25	106	105	144
<b>ZB1AR</b>	233	31	45	113	44	120
<b>G3FGT</b>	222	32	37	102	51	119
<b>G8VG</b>	217	24	57	110	26	124
<b>G2YS</b>	214	24	33	117	40	130
<b>G3ABG</b>	206	22	56	121	7	127
<b>G6QX</b>	202	16	32	108	46	122
<b>G2FYI</b>	193	5	33	124	31	131
<b>G3FXB</b>	188	21	48	88	31	101
<b>G6TC</b>	173	11	45	99	18	107
<b>G2HKU</b>	166	1	42	110	13	120
<b>G2VJ</b>	160	4	13	87	56	104
<b>G6AT</b>	159	21	46	91	1	97
<b>GM3EST</b>	158	20	23	113	2	117
<b>G2DHV</b>	144	22	20	91	11	94

TP-TG circuits, with, possibly, "two-toob low-loss" receivers. We can even hear some of the Old Timers muttering "And very nice, too" into their beards—which goes some way towards proving our point.

Our hobby *should* be leisurely and friendly—and it *can* be, whenever you want to make it so. But also it needs some stimulus and some urge which will keep the younger, livelier generation on their toes. After all, if you don't *want* to chase new countries, there isn't a single rule which says that you shall. If your idea of bliss is to sit on one band with one crystal and, in the manner of a comfortably fat spider, just reach out for what comes within your range—well,

who's to stop you? You only work yourself into a fever working new countries if you're the type that *likes* to talk about working new countries; you only give yourself a hangover at Contests if you *want* to enter for Contests. So please yourself, but don't complain that your hobby is being spoilt or over-organised. Any questions?

## Working the World

Pursuing the theme of country-chasing, it occurs to us that lots of people who don't go mad after new prefixes have probably worked more parts of the world than some of those that do. Remote islands are sometimes neglected if they don't count as a new country; distant parts of UAØ, VE8, KL7, PY and CE don't appeal to the country-chaser pure and simple. But there are those quieter types who are fascinated by seeing into how many spots on the globe they can drop their signals.

How many who flaunt a card from Chile on their walls have worked those CE7's right down in Punta Arenas? How many who have worked Brazil can show a contact with PY8 or PY9, 'way up the Amazon? And, in the Northern Regions, how many realise that KL7's have turned up from time to time on various Aleutian Islands (of which there are quite a few)? Then there was a UAØ on the Kamchatka Peninsula, to say nothing of some UA1's at Murmansk and Amdherma. And how many amateurs have worked King Christian Land, Melville Island, Bathurst Island or Boothia? For that matter, how many even know where they are? (For the record, they are all in VE8 territory.) Down the other end there are Elephant Island, Coronation Island, Bristol Island and Candlemas, all in VP8 territory.

Our point is that there are many "rare spots" on the earth's surface which will not give one anything to show in the way of published figures, but should, at least, give a glow of satisfaction to the operator himself. The sort of achievement that can only be recorded by sticking pins in a map on the shack wall is no less than that which puts one high up in a table of scores. Maybe some of you collectors of "Remote-spots-which-don't-count" would like to tell us about them next month? We might consider a consolation prize for the man who has worked the largest slices of the Earth with the smallest score in countries!

### The Month's DX

Pretty poor conditions have prevailed, so far as we can see, although those who don't mind the early hours on 3.5 and 7 mc have had little cause for complaint. The ZL's have been roaring through on both bands, morning after morning. On 3.5 mc they have been heard repeatedly at 579, which is better than their peak last winter. There have been a few G/ZL phone contacts on this band, and also on 7 mc. On both bands, it seems, the VK's have been more difficult to raise than the ZL's.

### DX on Twenty

G2WW (Penzance) bored through the Europeans and emerged with FM7WF, KV4AU, KZ5ES and MS4FM on CW, plus EA6AT, EQ3FM, HC4AB, SU1MR, UG6WD and UA9KCC on phone. The latter gave him a new Zone. He also worked II1CFN in Sicily and tells us that the new IT prefix seems to be official (derived from Trinatria, the old name for the island). Others also tell us this; but a new prefix doesn't mean that it's a new country—not yet!

G3ABG (Cannock) worked FY7YB

and YA2B—it's a shame about the latter! G2BJY (West Bromwich) thought conditions were fair, and even good, for Africa, but only once did the band open up for North America. His best were F9QV/FC, CR7CI, PK1TM, VE5UN, VQ2WR, ZS5IW/P, VS6AC, VU2JP, ZS3K and lots of VK's, ZL's and South Americans. All this, by the way, with 25 watts.

G4QK (Harpden) found the band "comfortably empty" and worked a few new ones, such as ZS3K and ZS8MK. He asks whether CR4AD, T6, is "any use"—we think he is genuine. On October 6, at 2100, 'QK heard three KP4's, KV4AC, ZS5GP and nothing else. He now has a nice open QTH and an aerial of 198 ft., North and South.

GM3EST (Motherwell) was one of the lucky ones to hook FP8AC. He found him the easiest DX station ever worked—the FP just came back to his first call! 'EST has also received his card from XE1VA for a 14 mc CW contact, but he still can't raise VP6CDI. He now has 95 cards towards his DXCC, and is anxious for the other five; he asks that



W6SAI when he was FP8AC at St. Pierre-et-Miquelon last July, which made him an attractive rarity in Zone 5 and produced for him 850 contacts in 40 countries during his short stay. Input was 30 watts on 7 and 14 mc, and the aerial ran across a busy street.

GD3UB and EI2G might please take note of this.

G2AJ (Biggin Hill), one of the leading VHF hands, is once again fully equipped with aerials, meaning three Lazy-H's, six half-waves in phase for 28 mc, and a 270-ft. long wire for 7 and 3.5 mc. He was very active in the VK/ZL contest and netted about 1200 points. On 14 mc he had 136 QSO's in the two week-ends; on 28 mc, none; and on 3.5 mc, five ZL's. Other 14 mc DX: F9QV/FC, VK9JC, HR1AT, VP7NM, EA6AM, FQ8AC and VP8AO (all new ones) plus ZS8MK, FM7WF, CE5AW, VQ3BNU and IT1CFN. 'AJ was also interested to work W5LGS in New Mexico on 14 mc phone, 1530 GMT and S9.

From G3ATU (Roker) comes news of a contact with VQ6BFC, who is MT2BFC on a flying visit. He was heard to say that he would shortly be in Nairobi. G3COJ (Hull) managed FN8AD, KH6DY, SU1MR, VK7AJ, YI3ECU, YN4CB and ZC1AL (all on phone) plus VK9JC, VP5BL and ZS8MK on CW. G6TC (Wolverhampton) collected ZS's, OQ5FG, VQ3 and 4, YI, CO and plenty of VK's and ZL's.

G3CVG (Wakefield) tells us that his Junior Op. is now second op. at VS6AC and is very anxious to work G's. At present only one crystal is available—14052—but a second one, 14086, is on the way out there.

#### The Forty-Metre Story

Quite a bit of DX can be chipped out of 7 mc, if you can find it underneath commercial broadcast, amateur broadcast, Russian commercials and all the miscellaneous seaweed that now covers the band. G5FA did some listening on Forty, and heard ZD4AB, TA3GVU, VP7NQ, VP8AJ and VP8BM; he worked VK's, W's, VE's and KP4 and ZB1.

G2WW says that apart from ZL's, "which are child's-play," he raised VK7OM the long way round. He has also been working HB9CH, with whom he recently stayed in Switzerland. But he has found conditions very erratic.

G3ABG had the unusual experience of working C8KY (Zone 23) on this band. 'ABG called CQ USA at 2330 GMT, and back came the C8, on about 7011 kc. We hope he is all right. G2BJY winkled out UA6 and UD6, along with many Europeans, and says he will be more active soon.

G2AJ has found the band good at times, and has emerged with ZD4AB, VV5BC, KP4MD, SVØWM, EA9BB,

YU3FMW and heard VP8AJ. Earlier in the year he worked VP8AI. G3ATU, on the other hand, did work VP8AJ, who is on Graham Land, but is believed to count as "South Shetlands," though we can't think why. 'ATU also raised VQ2GW and ZD4AB.

G3COJ used a rather low-hung 7 mc dipole for the VK/ZL Contest, and raised only VK5FH, although he could hear DL1FF simply knocking them off. He has recently heard more DX, including VP8AJ, ZD4AB, CX1AX and a PY. G6TC finds the ZL's easy to work, and collected four in quick succession one morning. Others were CM2QZ, VK4TY and KV4AU.

#### Activity on Eighty

There is not much worthy of individual mention, but quite a few of the enthusiasts have been keeping up a regular fire of ZL's in the mornings. G3ATU worked TA3FAS and CT2BR, and heard CT3AB and PY7WS. He also noted F3NB saying that VP5BF (Caicos) was now on Eighty. Several other nice "pieces" are known to be preparing themselves for the band, but wild horses refuse to do their stuff.

#### The Overseas Mail

W3NJT (Maryland) drops a note to say that he is Flight Radio Officer on TWA's "Connies" and was on their inaugural flight opening the London service on September 30. He hopes to "do the town" on future flights, so we may be seeing something of him in person.

VS7NX (Colombo) writes of the lack of CW activity in Ceylon. VS7BJ, 7KR, 7PW, 7RA, 7RF and 7NX himself use phone and CW, but many of the chaps "scrape through their code test and then go all out on phone." They have just formed a Radio Society of Ceylon; the President is the Head of the Dept. of Physics in the University of Ceylon, the Patron the Minister of Posts and Telecommunications, and the Vice-Patron the Postmaster General! 7NX says that DX is looking up, but when the G's come in it's so late that his Morse suffers, both on the straight key and the el-bug, which his friends call the piano. He is flat out for Zone 6 for WAZ.

VP5BJ is recently licensed in Jamaica, and sends his QTH and that of VP5BL for the box. 'BJ works 14 mc CW and has raised about 20 G's since he started. He is rebuilding to cover 3.5, 7, 14 and



This is the outfit and operator at DL7CI, Berlin.

28 mc, with all his aerials directed on Europe.

V\$2CP (Sungei Patani), who promised to come up on 3.5 and 7 mc, is "frustrated" by having had half his spares arrive, the other half seeming to have gone astray. He is for the present reduced to an output of about 5 watts, and says he has worked more DX with the "imaginary QRO" than he ever hopes to in actual fact.

VQ4RF (Nakuru) tells us that VQ4SC has sailed for G, and hopes to be operating soon as G8SC and GW8SC. He amassed lots of certificates before leaving Kenya and was given a royal send-off by the boys. VQ4ERR is now fully extended for his Double Century DXCC; when last seen he was at 197! VQ4AA and VQ4ZSW hope to visit VQ1 early in the New Year. 4AA is at present in hospital and QRT, but will be visiting 4RF for convalescence, possibly with ZS6NX as an extra visitor. 4RF himself has just returned from a trip round ZS-land, where he had a wonderful time. He also called in on the CR7's, who showed him every café in Lourenco Marques; those boys, by the way, are all on 230 volts DC, but hope to switch to AC and QRO some time soon.

F<sub>3</sub>HK (Louvéciennes) sends a long letter on the "country-prefix" situation, mostly imploring us not to make any drastic changes. (It's quite all right—we won't!) He asks that a permanent list of countries should be drawn up (regardless of revolutions or changes of spelling). He would like to see the question "When is a country not a country?" answered by reference to geography, which you cannot change according to how you feel. And the "irritating island cases" should be solved by "one island—one country, unless geography shows that you can jump from one to the next."

F<sub>3</sub>HK says that if we go on enlarging the list of countries and the multiplicity of certificates, the next step will be to count individual stations and issue a "Worked 100,000" Certificate or perhaps a "WAA" (Worked All Amateurs).

Seriously, though, 'HK pleads for a new country list with U.S. states and South American provinces included as countries, and the raising of DXCC to the figure of 200.

#### Top Band News

Back to the 160-metre band, where none of these problems worry us,

although there's always Monmouth and Berwick-on-Tweed. A most interesting item is that GW3FFE and GW3EOP both worked UB5BP in last year's "MCC," and both wrote him off as a phoney (and so did we all). The situation is now radically changed with the arrival of UB5BP's cards for both of them! This does not alter the Contest result—they were first and second anyway—but it makes one wonder why these two stations were the only ones to encounter the UB5. But we have seen both the cards, and apart from the usual Iron-Curtain reluctance to say anything at all, they give the correct reports and they check with times and everything. So we belatedly congratulate these two GW's on their UB5 contacts, and, for the record, GW3EOP was first.

G2NJ (Peterborough) remarks that DL2QM, operated by G3AMF, has been putting in excellent signals in daylight. HB9CM and 9DD have been heard very well around 0800 GMT, but there were few G's about at the time.

#### ZONES WORKED LISTING POST WAR

Station	Z	C	Station	Z	C
<b>Phone and CW</b>					
G6ZO	WAZ	222	G8PW	38	122
G6RH	WAZ	222	G3ABG	37	127
G6QB	WAZ	209	ZB1AR	37	120
G2FSR	WAZ	196	GM3EST	37	117
G3ATU	WAZ	196	G2GM	37	110
G4CP	WAZ	195			
G3DO	WAZ	191	G2FYT	36	131
G8IG	WAZ	181	G2YS	36	130
G5YV	WAZ	172			
G2VD	WAZ	170	G6QX	35	122
G3BI	WAZ	162	G2HKU	35	120
G3AAM	WAZ	154	G6TC	35	107
G2IO	WAZ	152			
G3YF	WAZ	152	G3FGT	34	119
G3AZ	WAZ	133	G6AT	34	97
G8IP	WAZ	132	G2DHV	34	94
G5BJ	WAZ	126	GM3CVZ	33	103
G5VU	WAZ	124			
G2AJ	40	185	G2BBI	30	98
G2WW	40	181			
G3TK	40	162			
G3FNJ	40	145			
G6BB	40	132			
G3BNE	40	128			
G5MR	40	125			
GM3CSM	39	158			
G8VB	39	149			
G3DCU	39	148			
G5FA	39	147			
G3CVG	39	145			
G3BDQ	39	138			
G3COJ	38	149			
G2BJY	38	144			
G3AIM	38	130			

Phone only		
G2AJ	38	153
G3DO	37	154
G6WX	37	128
G3COJ	36	125
G2WW	36	121
G2VJ	33	104
G2BBI	30	95

And now there is a letter from G5LF (Stanmore) concerning his operation as GM5LF/A in Islay earlier in the year. He found Top Band conditions pretty poor, especially in daylight, but had eleven sessions on the air, totalling 18 hours. He used 300 ft. of aerial with an average height of 20 ft. Only 25 different stations were worked; GM5LF/A had 32 QSO's and 56 fruitless calls. The average report he gave was only about 449, and he found that many people didn't seem to believe a weak report, judging by the way they kept going ahead with long "overs," many of which were lost. LF found the whole thing most interesting, although rather disappointing from an operating point of view.

Another portable expedition was run by G2ETO (Bolton), who was licensed as GM2BTO/P within ten miles of Wick. He was really unable to operate on the Top Band, but did some good work on 7 mc, with an outside aerial but all the transmitting gear (4 watts of it!) on the back seat of the car. Finally, 'BTO contacted an SWL near Wick who had a 132-ft. aerial and a Top Band receiver, so he did get on the band for a short while after all.

And finally in this section, don't forget that a high level of worth-while DX activity is expected during the 1.7 mc Trans-Atlantic Tests to be held early next year. The essential details can be found on p. 428 of our August issue. You will be reminded again in good time.

#### Miscellany

G5FA claimed his "WAE" certificate and was surprised to find that he was the first G to receive one. The very first certificate issued went to our old friend W2IOP, and 'FA claimed No. 10. He had a visit from VP4TS during the month; the latter is home on leave but is going out to Venezuela and hopes shortly to operate as a YV.

G2WW reports slight signs of a ten-metre opening. He has been entertaining ZS1AX for a while, and together they heard TA3GVU actually working W's on the band, round about lunch-time one day. They even heard W4OOR for themselves.

G3GUM (Formby) has been amassing quite a good score, but says he is thinking of founding a new Club, to be called the NOMCC ("Nice Ones Missed" Century Club). He would already qualify for membership! He heard five ZL's and a PY on 3.5 mc one morning,

and his "missed DX" on 14 mc makes wonderful reading, although he did succeed in snagging CX, EA8, KZ5, VS1, VU, KL7, TF, KV4 and about 30 VK's and ZL's.

G2YS (Chester) puts up a plaint about the sheep-like behaviour of amateurs on some bands. Why do they all crowd into the lowest 30 kc of the 7 mc band? Why (as we asked recently) do they all work between 1800 and 1900 kc, leaving almost a complete void between 1715 and 1800? 'YS says that HA4SA will be on the Top Band "when he can manage to wind a coil." He may even pop up for MCC.

G2FYT (Bristol) has been almost dormant for three months but is about to awaken. He is now a proud holder of DXCC, with 114 confirmed out of 131 worked. G3ANW (Mitcham) passes the gollowing gen. relating to TA3GVU. Every QSL received will be acknowledged, *via* W2SN unless a self-addressed envelope and a Reply Coupon is sent, in which case he will QSL direct. No QSL's to be sent direct to him, but all *via* W2SN.

Some interesting remarks on aerials are made by G3COJ. He has used at least 29 different types (including VHF) during the past three years, and now has a 7 mc ground-plane job. This, he says, lives up to its reputation by being equally poor in all directions. He thinks this may be because of absorption by nearby trees, which may account for the fact that all the leaves have been turning brown. On 14 mc he has been using a N-S dipole which has worked quite well in the appropriate directions, but he changed it to 67-ft. end-fed and immediately raised ZS8MK, which may prove something or other.

#### This QSL Business

Various recent remarks to the effect that G2... has a card from VP1AA while G3... can't get one, and so on *ad infinitum*, have now produced such a volume of correspondence that it has got quite out of hand. The only way to deal with it is to forget the whole thing. Otherwise we should have a complicated table showing which countries have QSL'd to someone but not to somebody else; which have never QSL'd at all; and which have QSL'd to absolutely everybody except poor old G6..., who can't raise a card for love or money. So let's just accept the fact that some do and some don't; and that some have a system and some others haven't.

#### Pirates Again

Before embarking on this theme, we should like to say that we agree entirely with G2HCZ (Ilford), who says that many supposed cases of piracy are due to a simple error of some kind. They can be due to misreading of call-sign caused by (a) Bad sending on CW; (b) Bad enunciation on phone; (c) Inexperience at receiving end; (d) Bad writing on card; (e) Sheer carelessness resulting in reversal or transposition of letters. Any QSL Manager will tell you that he meets dozens of these errors every day. Personally, if we receive cards for QSO's that didn't happen, we automatically forward them to G6BQ—and he does the same in the reverse direction. Otherwise we should both have been screaming about pirates for years past!

G3BHT (Liverpool) operates on 20 and 80 only, but someone has been using his call on 40-metre phone; G3GJR (Sutton Coldfield) has been receiving QSL'S for periods when he was not operating; and G3EXZ (Southampton) has a card from UA6LL for a QSO that took place before he was licensed. Perhaps the rightful owner would like to claim it (7th of Sept. or Oct., 1949).

A different and more blatant type of piracy was encountered by G8VB (Greenford). In the middle of a multi-way a station actually came up on the frequency and proclaimed that he was the genuine G8VB and that "the other station using the call on the frequency" was a pirate. This, of course, is sheer bravado and will doubtless lead the perpetrator straight into serious trouble. His approximate location is known already.

(over)

#### DX QTH's

<b>3A2AB</b>	<i>via</i> DL4 QSL Bureau.
<b>9S4AX</b>	A. Woerner, Saarstrasse 9, Saarbrucken 3, Saar.
<b>EA0AB</b>	Box 111, Santa Isabel, Spanish Guinea.
<b>PK5AA</b>	Radio Station, Balikpapan, Borneo.
<b>VP5BJ</b>	Garnett Green, 40 Arnold Road, Cross Roads P.O., Jamaica.
<b>VP5BL</b>	Vin Hayes, 8 Heathfield Road, Cross Roads P.O., Jamaica.
<b>ZS3X</b>	Box 85, Windhoek, South West Africa.

### Behaviour on the Bands

Recent remarks on the subject of general behaviour and operating practice have brought in so many letters that we cannot hope to deal with the subject in this Commentary. We therefore intend to summarise the way things are going in a short article dealing with that subject alone. Briefly, it may be said that we have heard from (a) Those who think that a standardised code for calling and signing-off would be a good thing; and (b) Those who say "If I want to call CQ for five minutes I shall darned well do it," and also "If I want to take ten minutes saying good-bye, who is going to stop me?" Also from some who say (c) "Why should I send at more than 15 w.p.m. just to alleviate the QRM?" and others who say (d) "Why should I be forced to send slowly for a lot of lazy so-and-so's who have never bothered to learn their code?"

You will gather from this that the subject is somewhat complicated, but, at least, worthy of discussion. So we will write a short treatise that will make

your hair curl and then leave it to you. Good *may* result from it, although we rather feel that Amateur Radio is averse to being organised, standardised, nationalised or any other -ised. Long may it remain so—provided it keeps healthy in the process.

Readers who have asked where that bad character Arabackle Oblifork has disappeared to may like to know that he has a pen-pal in Aberdeen, named I. McLott, who appears to be a worthy upholder of the Arabackle tradition. Just after some of the recent pile-ups over 3A2AB, I. McLott wrote and asked "Why are all these chaps so terribly keen on working VK2AB?" (All right, you tell him).

And that's all from here this month. Next month's deadline will be November 16 latest and, for the benefit of our overseas readers, the following month's will be December 14. Address all your outpourings to DX Commentary, *Short Wave Magazine*, 53, Victoria Street, London, S.W.1. Until then, 73 and Good Hunting.

### NEW CATALOGUES

The attention of readers is drawn to the new catalogue now in issue by Webbs Radio of Soho, price 9d., and listing a wide range of essential parts and equipment of interest to every radio amateur.

Then there is List No. 7 available at 6d. from Clydesdale's of Glasgow, which will be of particular interest to those who want the best in high-grade surplus gear, moderately priced and fully described in this List.

### CHANGE OF ADDRESS

We are informed that Q-Max Electronics, Ltd., formerly of Little Turnstile, W.C.1, are now to be found in larger premises at 95 Villiers Road, London, N.W.2.

### THE BC-348 CONVERSION

We can still supply copies of our *Short Wave Listener & Television Review* for June, July and August this year, containing in three parts a long, fully detailed article on BC-348 conversion and modifications. This is probably one of the most complete treatments of its kind ever published on the BC-348, and suggests a number of possible new modifications which make this well-known receiver even more effective on the amateur communication bands.

### XTAL XCHANGE

Insertions in this space are free, but can be given in respect of exchanges of crystals only; buy-or-sell notices can *not* be accepted for publication here. Crystals offered for exchange should be (a) Within one of the amateur bands or harmonically related, or (b) Sub-standard frequency bars in the range 100-1000 kc. It should be stated whether calibration certificates are available, with the make or type and pin spacing of the crystal. All negotiations respecting exchanges must be conducted direct, and notices set out in the form shown below headed "Xtal Xchange—Free Insertion."

**G3DCJ, 4 Daniel Place, Penzance, Cornwall.**  
Has ex-Service 7200 and 7300 kc crystals,  $\frac{1}{4}$ -in. pin spacing, no certificates. Wants 100 kc bar.

**G3DSV, 11 Clivedon Road, Highams Park, London, E.4.**  
Has ex-Service 8001.5 and 8007.7 kc crystals,  $\frac{1}{4}$ -in. pin spacing. Wants frequency 8048-8068 kc.

**G6KR, Ardlui, Wenlock Road, Shrewsbury, Salop.**  
Has 100 kc 3-pin, 3560, 7100, 7190, 7350, 18025 and 18125 kc crystals, no certificates. Wants 1000 kc bar, and frequencies 3500, 3800, 7000, 7200 and 7300 kc.

**SWL, 44 Jenkins Road, Plaistow, London, E.13.**  
Has 5430 and 6410 kc crystals. Wants 8 mc frequency to fall in two-metre band (x 8).

## NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the quarterly issue of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

<b>G2BCO</b>	H. Worsley ( <i>ex-G2DUD</i> ), 8 Hall Grove, Cheadle, Cheshire.	<b>G3GWH</b>	G. E. Martin, 42 Okehampton Street, Exeter, Devon.
<b>G3BHQ</b>	K. Robinson, 51 Hill Top Road, Old Whittington, Chesterfield, Derbyshire.	<b>G3GWJ</b>	W. Steele, 23 Brookvale Road, Langley Mill, Notts.
<b>G3BHT/A</b>	B. G. Meaden, West Lancs. Div. Army Cadet Force Training School, Altcarr, Hightown, Lancs. ( <i>QSL</i> to 10 <i>Afriston Road, Liverpool</i> , 12).	<b>G3GWO</b>	M. G. Groom, 55 Broadwater Way, Worthing, Sussex.
<b>G3CNJ</b>	S. S. Spraggs, 57 Forest Road, Worthing, Sussex.	<b>G3GWU</b>	A. Stenhouse, 199a, Railway Terrace, Rugby, Warks.
<b>G3EKG</b>	R. M. Prevett, Stonebrook House, Somerton, Somerset.	<b>GW3GWX</b>	L. P. Jones, Lenarda, Great Orme, Llandudno, N. Wales.
<b>G3EMQ</b>	L. Tattersall ( <i>ex-XZ2AG</i> ), 55 Ripon Street, Blackburn, Lancs.	<b>G3GX A</b>	J. A. Payter, 13 Bramshott Road, Milton, Southsea, Hants.
<b>G3EXZ</b>	J. Horner, 32 Somerton Avenue, Bitterne, Southampton.	<b>G3GXN</b>	R. Mapplebeck, 118 Camp Road, Leeds, 7, Yorkshire.
<b>GC3FSN</b>	R. A. Butcher, 5 Valley Gardens, Bel Royal, St. Lawrence, Jersey.	<b>G3GXO</b>	E. C. Nevison, 48 St. Heliers Avenue, Hounslow, Middlesex.
<b>G3FZI</b>	W. F. Diggins, 111 Courthill Road, Lewisham, London, S.E.13.	<b>GI3GXP</b>	W. F. McGaigie, 61 Newcastle Street, Kilkeel, Co. Down. ( <i>Tel. : Kilkeel 298</i> ).
<b>G3GKC</b>	I. Rosevear, 25 Oreston Road, Oreston, Plymouth, S. Devon.	<b>G3GXW</b>	G. Lamb, 14 New Street, Netherton, Huddersfield, Yorkshire.
<b>G3GMZ</b>	F. T. Hardy, 12 Kingsmead Avenue, Tolworth, Surbiton, Surrey.	<b>G3GXZ</b>	M. H. Kind, 62 Clifford Street, South Wigston, Leicester.
<b>GI3GQB</b>	W. A. Kane, 5 Park View Terrace, Ballywalter, Co. Down.	<b>G3HRC</b>	R. C. B. Cutts, 8 Beech Court, Kingsground, Eltham, London, S.E.9.
<b>G3GQW</b>	D. Whitehead, 328 Upper Fant Road, Maidstone, Kent.		
<b>G3GRK</b>	C. R. E. Ayley, 88 Alderton Road, Croydon, Surrey.		
<b>G3GRL</b>	J. A. Bonser, Brookside, Watnall Road, Hucknall, Notts.	<b>CHANGE OF ADDRESS</b>	
<b>G3GSM</b>	H. G. F. Child, 52 Gladstone Road, Wimbledon, London, S.W.19.	<b>EI3W</b>	J. B. S. Lawlor, Glenflesk, Knader, Road, Ballyshannon, Co. Donegal, Eire.
<b>G3GTL</b>	G. G. Brown, Jnr., 3 Broomfield Close, Reddish, Stockport, Cheshire.	<b>EI6X</b>	B. Fogerty, c/o Cliff Power Station, Clother, Co. Donegal, Eire.
<b>GM3GTQ</b>	A. I. McPhedran, 77 Kings Lynn Drive, Glasgow, S.4.	<b>G2BCD</b>	E. A. L. Barrall, 3a Short Wyre Street, Colchester, Essex.
<b>GM3GUJ</b>	J. M. Lyons, B.Sc., A.R.I.C., 35 High Street, Fochabers, Morayshire.	<b>G2BFQ</b>	M. E. Edwards, 3 Greenhill Crescent, Harrow, Middlesex.
<b>G3GUL</b>	N. Cash, 69 Foulden Road, Stoke Newington, London, N.16.	<b>G2BRQ</b>	C. J. Lamb, Flat 3, Wakefield, Hare Hatch, nr. Twyford, Berks.
<b>G3GUM</b>	F. N. Baskerville, Briarwood, Green Lane, Formby, Lancs.	<b>G2FQD</b>	A. L. Rogers, 6 Wodehouse Terrace, Falmouth, Cornwall.
<b>G3GUP</b>	Cpl. E. Howell, c/o 136 Beacon Road, Chatham, Kent.	<b>GM2HCL</b>	F. Walsh, Briar Cottage, Kingsbarns, Fife.
<b>G3GVA/A</b>	3122055 Cpl. Bratby, J. A., Hut Y-13, "Y" Squadron, R.A.F. Station, Compton Bassett, nr Calne, Wilts.	<b>G2HPF</b>	H. Lowe, Akabo, Main Road, Boreham, Essex.
<b>G3GVA</b>	J. A. Bratby, 99 The Broadway, Dudley, Warks.	<b>G3AFM</b>	E. R. Creek, 9 Cranbourne Road, Northwood Hills, Middlesex.
<b>GW3GVB</b>	B. H. Phillips, 25 Pentyla Road, Sketty, Swansea, S. Wales.	<b>G3CAT</b>	A. F. Ward, 52 West End Road, Ruislip, Middlesex.
<b>G3GVJ</b>	J. F. Davis, 23 Carnarvon Road, Redland, Bristol, 6. ( <i>Tel. : Bristol 45706</i> ).	<b>G3CVW</b>	R. F. Saunders, Ploughfields, Crabtree Lane, Harpenden, Herts. ( <i>Tel. : Harpenden 846</i> ).
<b>G3GVM</b>	F. L. Robins, 105 Congreve Road, Worthing, Sussex.	<b>G3DBV</b>	J. A. Hedges, 22 Worsley Street, Eastney, Southsea, Hants.
<b>G3GVR</b>	P. J. Blewett, Police H.Q., 1 Pound Lane, Bodmin, Cornwall.	<b>G3DWQ</b>	G. Lancefield, 32 Leach Street, Blackburn, Lancs.
<b>G3GVR/A</b>	P. J. Blewett, 71 Brent Park Road, Hendon, London, N.W.4.	<b>G3EBH</b>	G. C. Newby, 10 Addison Drive, St. Giles, Lincoln.
<b>G3GVS</b>	F. J. Cox, 25 Barrowby Lane, Austerhope, Halton, Leeds, Yorkshire.	<b>G3EJF</b>	J. E. Hodgkins, 24 Beryl Avenue, Tottington, nr. Bury, Lancs.
<b>G3GVT</b>	K. Drabble, 189 Crookes, Sheffield, Yorkshire.	<b>G3EKN</b>	F. J. Taylor, 224 Fox Hollies Road, Acock's Green, Birmingham, 27.
<b>G3GVU</b>	R. S. Babbs, B.Sc., 28 Grove Lane, Kingston-on-Thames, Surrey. ( <i>Tel. : KIN 2801</i> )	<b>G3EOX</b>	D. R. Holdcroft, Midoran, Fowlers Lane, Baddeley Edge, Milton, Stoke-on-Trent, Staffs.
<b>G3GVZ</b>	F. J. Glynn, 13 Station Road, East Grinstead, Sussex.	<b>GM3GBM</b>	J. G. Collyer, Catherine Bank, Sands Place, Aberdour, Fife.
<b>GW3GWA</b>	R. G. Goulding, 10 Earle Street, Wrexham, Denbighshire, N. Wales.	<b>GW3KY</b>	I. Jones, Uwch-y-Don, Llanfwrog, Isle of Anglesey.
<b>G3GWD</b>	M. Paveley, 85 Callander Road, Catford, London, S.E.6.	<b>G6AU</b>	C. C. Algar, 35 Weihurst Gardens, Sutton, Surrey.
		<b>G8QX</b>	K. Hopkinson, 20 North End Lane, Malvern, Worcs.
			<b>CORRECTION</b>
		<b>G2COG</b>	A. A. Leith, 57 Leigh Road, East Ham, London, E.6.
		<b>GW3BJZ</b>	T. Richards, Penrhiew, Aberffrwd Road, Mountain Ash, Glam.

# VHF BANDS

By E. J. WILLIAMS, B.Sc. (G2XC)

**Seventycem Ranges Extending—**

**G3QC/G8DD work 75 miles on  
1250 mc for new World Record—**

**Two-Metre News & Views—**

**Calls Heard & Achievement Tables—**

MUCH of the monthly argument over whether conditions have been good or bad is undoubtedly due to differing conceptions of what is meant by the term "good conditions." To many it implies an ability to work over paths in excess of, say, 100 miles, and consequently if they can do that every day, then conditions are always good. To others it means conditions superior to normal, and to them good conditions will be a much rarer occurrence. Both groups will, however, probably agree that conditions were good during the third week of October. No new two-metre records have been reported at the time of writing this, but as the conditions are still in existence, it may be that some Stop Press news will come in.

On Seventycems also there has been a noticeable improvement. An SWL in Wembley (A. L. Mynett) was able to receive 70 cm signals from G5BY on October 18. The distance is 181 miles, so everything seems set for a new record. G5BY was first heard in Wembley at 1840 BST, calling G6LK, at RST 53/19. He was received again at 1853, 2115, 2130, 2145 and 2200, being RST 559 at the last time. As a point of interest, at 1834 a two-metre phone transmission from G5BY was R5S6.

The following evening G2DD (Stanmore), G2QY (Pinner) and A.L.M. all heard 70 cm signals from G2XC. A.L.M. reported G2XC at RST 56/49 at 1841, while G2DD and G2QY both received signals at S<sub>4</sub> peaks with fading to zero.

At 2215 G2DD logged G2XC again at RST 549, with slow fading to S<sub>2</sub>. The distances are over 60 miles.

On October 16, G5BY and G6LK had three two-way contacts, at 1855, 2055 and 2255 BST. G5BY's signals were peaking at S<sub>9</sub>, but G6LK was only S<sub>4</sub>. G6LK has been receiving G5BY consistently on 70 cm during the past few weeks, and much of the credit for that must go to his new receiver, brief details of which are given later.

**Crystal Diodes**

Numerous readers have been good enough to send information regarding crystal diodes, and it is thought the following summary may be of general interest. Types CV 101, 102 and 103 were designed for use between 2,500 and 6,000 mc, while CV 111, 112 and 113 are for the band 6,000-12,000 mc. The three crystals in each

**430 mc DX**

At about midnight on October 20-21, G2CIW (Romford, Essex) received G5BY (Bolt Tail, S. Devon) on 70 cm at RST-559. This distance is over 200 miles and though G5BY was unable to hear G2CIW it sets the stage for a new World Record.

G5TP (Stoke Row, Oxon.) received G2XC (Portsmouth) on 70 cm at RST 589-S3 at 2115 on October 21.

of these groups are the low level, medium level and high level burn-out types respectively. Rectified current should be kept below 1 mA if possible, but the maximum forward currents permissible to avoid burn-out are 5, 20 and 50 mA respectively. All these crystals are intended for use in tunable mixer circuits.

Types CV253, 291, 351 and 364 are designed for operation in special pre-tuned circuits, while CV241, 246 and 247 are detectors, and not mixers. CV226 is a noise generator, and CV361 is for use as an interference suppressor.

## TWO-METRE ACTIVITY BY ZONES AND COUNTIES

*(Based on reports for current issue only)*

### **Zone A** (144.0 to 144.2 mc)

**Fife** : GM3EGW  
**Lanark** : GM3BDA

### **Zone C** (144.2 to 144.4 mc)

**Lancashire** : G2OI, G8SB  
**Northumberland** : G2LQ, G3CYY, G4LV, G4LX  
**Yorkshire** : G2IQ, G2MA, G3COJ, G3CUJ, G3DRG, G6YO, G8GL, G8IC

### **Zone E** (144.4 to 144.65 mc)

**Cheshire** : G2CDB, G3ATZ, G3FMI, G4OS  
**Leicestershire** : G2FNW, G2RI  
**Lincolnshire** : G3DMU, G4OF  
**Nottinghamshire** : G3APY  
**Warwickshire** : G2ATK, G2BFT, G3ABA, G3BPW, G3BVJ, G4RK, G5SK, G6CI, G8QY

### **Zone F** (145.65 to 145.8 mc)

**Glamorgan** : GW3EJM  
**Montgomeryshire** : GW2ADZ  
**Shropshire** : G3AHT, G4LU

### **Zone G** (145.65 to 145.8 mc)

**Bedfordshire** : G3CGQ  
**Buckinghamshire** : G3CVO, G3GBO, G3MI, G4MR, G6JK, G6NB  
**Cambridgeshire** : G2AIQ, G2UQ, G2XV, G3AEP, G3BK, G3WW, G4MW  
**Hertfordshire** : G3GDR, G5UM, G6LL  
**Huntingdonshire** : G2FQP, G3AKU, G3AVO/A  
**Norfolk** : G3VM, G5UD  
**Northants** : G2HCG, G3DUP  
**Suffolk** : G2CPL

### **Zone H** (145.25 to 145.5 mc)

**Berkshire** : G5RP, G6OH, G8LG

**Dorset** : G3ABH, G5UF

**Gloucestershire** : G3GEN, G3MA, G3YH, G5BM

**Hampshire** : G2NS, G2XC, G3ARL, G3BHS, G3BNC, G3CGE, G3DEP, G3FAN, G3GAV, G3GOP, G6XM

**Oxfordshire** : G5TP, G6KB

**Wiltshire** : G2BUJ, G8IL

### **Zone I** (145.5 to 145.65 mc)

**Cornwall** : G3AGA

**Devon** : G2BMZ, G5BY, G5QA

**Somerset** : G3EHY

### **Zone J** (144.85 to 145.25 mc)

**Essex** : G2CIW, G2WJ, G3ECA

**Kent** : G2AOL, G2KF, G2UJ, G3BOB, G3BVA, G3CAZ, G3FMK, G3DAH, G4FB, G6AG, G6VX

**London** : G2AFB, G2DTO, G3BUN, G3EIW, G3FSI, G3FXG, G4AU, G5DT, G5LI, G5PY, G6HG, G6WU, G8KZ, G8VR

**Middlesex** : G2AHP, G2DD, G2FMF, G2HDZ, G2QY, G2YC, G3CKX, G3DGN, G3EEI, G3GSE, G3SM, G4HT, G4KD, G5BC, G6UH, G8IP

**Surrey** : G2ANT, G2BN, G2MV, G2NH, G3BLP, G3GHI, G4CG, G4CI, G5DS, G5LK, G5MA, G5NF, G6CB, G6LK, G6NF, G6SC, G8SM

**Sussex** : G2AVR, G2JU, G2MC, G3BEX, G3EBW

**Note** : Frequency areas given above are in accordance with the Two-Metre Zone Plan, as accepted by the majority of VHF operators. A few stations are not conforming.

With the exception of these last two, all crystals should have a forward resistance not greater than 250 ohms and a back-to-front ratio not less than 10 to 1 when measured on the 100,000 ohm range of an Avometer Model 7. This means applying 0.4 volts in forward direction and 1.4 volts in reverse.

It has previously been implied in these columns and elsewhere that the CV103 was the British equivalent to the American 1N23A. This is apparently not so, and the CV112 would seem to be a better equivalent.

#### Other Seventycent News

G8VR (London, SE2) has been listening on 430 mc using a G3EJL Lecher line, silver plated, in conjunction with an RCA signal generator, working on its fundamental frequency, as local oscillator. Results were excellent and S9 signals were received from G2CIW, G2FKZ, G3EIW/P and G3FZL. The

signal generator only being on loan, G8VR has now constructed what he describes as "a 9002 Pot oscillator with fabulous stability"—see photograph.

G2OI (Eccles) has been working G3ELT, just over three miles away, and getting S9 results. He has two aerial systems available: a corner reflector with two directors, and a 16-element array. He has tried various RF amplifiers on the band, including a 6J6 Lecher circuit, but so far none of them have given any gain. A concentric line amplifier using a GG triode is the next on the list for trial. G3DA (Liverpool) and G3AHT (Oswestry) have been heard, and G2OI beams South on two metres every night in hopes of a possible change to 70 cm.

G6LK (Cranleigh), as mentioned earlier, has been building new converters. Considering harmonic injection undesirable due to possible saturation of the crystal by unwanted frequencies, it

was decided to inject at signal frequency minus IF. A separate crystal oscillator valve plus two 6J6 stages produced the necessary 408 mc. At the same time, the Lecher line circuits were replaced by "cavities." A similar receiver, but with a 446A lighthouse RF amplifier, has since been built, and results with both designs are most encouraging. G<sub>2</sub>FKZ at 27 miles has been worked several times through the 800 feet North Downs, which are only 3 miles from G<sub>6</sub>LK.

G<sub>5</sub>PY (Clapham Park) has worked G<sub>5</sub>TP (Stoke Row) at 40 miles and receives him at a consistent S9. The 1294 and 1359 receivers do not seem to be much different as regard sensitivity, but the 1359 is much more selective. G<sub>3</sub>FZL (Dulwich) has found a CV102 to

be the best crystal so far tried, but he remarks that as he uses a CV88 RF amplifier which helps reduce noise level, this crystal may not necessarily be best in a non-RF stage receiver.

G<sub>3</sub>CU (London, S.E.) sends latest news of the South London UHF Group. Some 13 stations in the London area are known to be active and can be heard most Sunday mornings. Three really modern transmitters and receivers have been constructed and installed at G<sub>2</sub>FKZ, G<sub>3</sub>CU and G<sub>3</sub>FZL. The transmitters at the last two stations use a STC 3B/401J disc-seal triode as a power doubler stage in a trough concentric line circuit. The input is 24 watts and the measured efficiency 32% on 435 mc. G<sub>2</sub>FKZ has four CV53's in a push-pull parallel-cathode and paralleled-anodes

## TWO-METRE ACTIVITY REPORT

### G8VR, Upper Abbey Wood, London.

**WORKED:** DL4XS/3KE, F8JR, G2CPL, 3AEP, 3BUN, 3CAZ, 3EBW, 3EHY, 3EYV, 3FMK, 3GDR, 4AU, 4HT, 5UD, 6AG, 6HG.  
**HEARD:** G2IQ, 2XV, 3ABA/P, 3BK, 3MI, 3VM, 4MW, 5RP, 5UF. (September 13 to October 8).

### G3EHY, Banwell, Somerset.

**WORKED:** G2AIQ, 2CIW, 2CPL, 2DD, 2FNW, 2MV, 2OI, 3ABA/P, 3AHB, 3AHT, 3ATZ, 3BLP, 3BOB, 3COJ, 3DA, 3DUP, 3FD, 3FMI, 3FYR, 3GDR, 3GEN, 3MA, 3YH, 4HT, 5DS, 5LI, 5MA/P, 5RP, 5UD, 6UH, 6NB, 6WU, 8GL, 8KZ, 8SB, 8VR, GW2ADZ, 3EJM.

**HEARD:** G2XV, 3AFV, 3AGA, 6LK. (September 11 to October 7).

### G2JU, West Wittering, Sussex.

**WORKED:** G2ANT, 2HCG, 3ARL/P, 3DEP, 5MA/P, 6NB, 6UH.

**HEARD:** G2BMZ, 2XV, 3BLP, 3ENI, 4CI, 5NF, 6LK. (September 1 to October 7, Saturday only).

### G8IC, Stainforth, Yorks.

**HEARD:** G2CPL, 2HCG, 3ATZ, 3BPD, 3COJ, 3CUJ, 3DMU, 3DRG, 3DUP, 3VM, 4HT, 4MW, 4OF, 5UD, 6NB, 6YO. (September 6 to October 8).

### G3WW, Wimblington, Cambs.

**WORKED:** G2AIQ, 2AVR, 2FNW, 2FQP, 2UO, 2XV, 3AEP, 3AKU, 3BK, 3EHY, 3VM, 4MW, 6LL, 6NB.

### G3ABA/P, near Coventry, Warwickshire.

**WORKED:** G2ATK, 2BFT, 2BUJ, 2FNW, 2HCG, 3ABH, 3AHB, 3BLP, 3BVJ, 3EHY.

3FD, 3FYR, 4HT, 4LU, 4MR, 4RK, 5DS, 5SK, 5TP, 6CI, 6LK, 6NB, 6XM, 8QY, GW2ADZ, ON4BZ. (October 7 to 8).

### G2KF, Edenbridge, Kent.

**WORKED:** G2AJ, 2CIW, 2MV, 2NH, 2UJ, 2XC, 3AEX, 3DIV/A, 3DXA, 3EBW, 3EIW/P, 3GBO, 3GSE, 4AU, 4CI, 4FB, 4HT, 4IB/P, 4MR, 5LK, 5MA/P, 5UF, 5UM, 6AG, 6CB, 6PA, 6UH, 6VC, 6VX, 6XM, 8IP, 8QC, 8VR.

### G3AHB, Slough, Bucks.

**WORKED:** F8MX, G2ANT, 2ATK, 2BN, 2HCG, 2WJ, 2XC, 3ABA/P, 3AEP, 3EBW, 3EHY, 3ENI, 3MI, 3WW, 4MW, 5BC, 6AG, 6LR. **HEARD:** F8GH, 9MX, G2IQ, 2OI, 2WS, 2XV, 3AHT, 3CKX, 3EJL, 5BY, 5UD, 6SC. (September).

### G4HT, Ealing, Middlesex.

**WORKED:** G2AIQ, 2AVR, 2CPL, 2FNW, 2MA, 2OI, 2RI, 2UO, 2XC, 2XV, 3ABA, 3ABA/P, 3AEP, 3AHT, 3APY, 3AVO/A, 3BK, 3DUP, 3EBW, 3EHY, 4MW, 5UD, 5UF, GW2ADZ. **HEARD:** G3ABH, 5BY.

### G3BLP, Selsdon, Surrey.

**WORKED:** G2AVR, 2BMZ, 2CPL, 2RI, 3ABA, 3AHT, 3ATZ, 3DRG/A, 3DUP, 3EHY, 3ENI, 3FMK, 4FB, GW2ADZ. **HEARD:** G3BPW, 5UD.

### G5DS, Surbiton, Surrey.

**WORKED:** G2AVR, 2AFB, 2CPL, 3ABA/P, 3BK, 3DUP, 3EBW, 3EHY, 3VM, 3WW, 4MW, 5UF.

**HEARD:** G2AIQ, 2IO, 2NS, 2WJ, 2XC, 3AEP, 3DEP, 3DSK/A, 3EEI, 3EJL, 3GTH, 5AA, 5DT, 6TV, F8MX. (September 10 to October 10).

### G2AVR, Bexhill - on - Sea, Sussex.

**WORKED:** DL4XS, F8GH, 9MX, G2AHP, 2DL, 2FMF, 2HDZ, 2KF, 2MV, 2UJ, 2WJ, 3BPL, 3CGO, 3DEP, 3DGN, 3FMK, 3FXG, 3GDR, 3GHI, 3WW, 4HT, 5DS, 6AG, 6CB, 6JK, 6LO/A, 6NB, 6UH, 8KZ. (September 3 to October 6).

### G2XC, Portsmouth, Hants.

**WORKED:** F8JR, G2AHP, 2AIQ, 2ANT, 2CIW, 2CPL, 2DD, 2MC, 2WJ, 2XV, 3BEX, 3BHS, 3DEP, 3EBW, 3ECA, 3ENI, 3FAN, 3FD, 3FXG, 3FYR, 3GAV, 3GOP, 3VM, 4HT, 4KD, 4MW, 5BY, 5DS, 5LI, 5LQ, 5NF, 5PY, 5US, 6KB, 6LK, 6LR, 6WU, 8IL, 8LY.

**HEARD:** G2YC, 3AHB, 3BLP, 3BNC, 3DAH, 3GHI, 3GSB, 5MA, 5RO, 5TP, 5UM, 5UF, 6JK, 6LL, 6NB, 6XM. (September 25 to October 20).

### G3ENI, Abingdon, Berks.

**WORKED:** G2BN, 2XC, 3ABH, 3AHB, 3DEP, 3EHY, 4HT, 5MA/P, 5TP, 6JK, 6KB, 6NB, 6XM, 8IL.

## 70 cm Activity Report

### G6LK, Cranleigh, Surrey.

**WORKED:** G2ANT, 2DD, 2FKZ, 2QY, 2XC, 3ABH (90 miles), 5BY (161 miles), 5TP.

**HEARD:** G3DEP, 5PY, 6XM.

### G2OI, Eccles, Lancs.

**WORKED:** G3ELT. **HEARD:** G3AHT, 3AOO, 3DA.

### G2QY, Pinner, Middlesex.

**WORKED:** G2DD, 2FKZ, 3FP, 4CG, 5CD, 5TP, 6LK.

arrangement, driving a ME1003 straight amplifier in a concentric line circuit with 68% efficiency. The receivers use CV88 RF stages in a concentric line with built-in crystal mixer. The local oscillator is CC, starting with a 22 mc frequency and finishing in a tuned coaxial line at 400 mc. This is fed through a high pass filter to remove undesirable frequencies. A tunable IF (32 to 38 mc) is used.

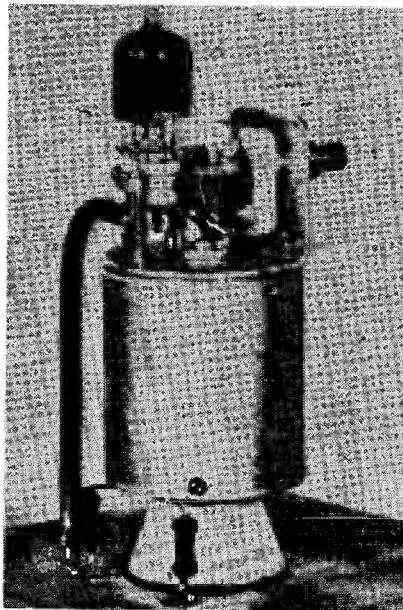
G2QY (Pinner) continues his nightly schedules at 1930 and 2215. He is experimenting with an RF stage and new aerials; G6LK at 32 miles and G5TP at 27 have been worked.

Several suggestions have reached us regarding this matter of 70 cm activity periods, but it is obvious that no period can be found which will satisfy everyone, and it appears that the best course is for stations to arrange individual schedules. If DX is the aim, then it does seem reasonable to use Two as a guide. Occasional discrepancies between the performances of the two bands may be reported, but, in general, good conditions on 2 metres means good conditions on Seventycentimeters. On October 19, for example (when G2XC was getting into the London area on 435 mc) two-metre signals were excellent over the same path (a report of S9 plus 15 dB was obtained), and the A.P. television was so strong at G2XC, 70 miles away, that a picture could be held at entertainment value with the contrast control at minimum. On this point, it may be worth recording that over this path fading was negligible at 45 mc (except for a slight and steady increase of signal throughout the evening), but was noticeable at 145 mc, and was deep at 435 mc.

## Two Metre News

G2KF (Edenbridge) normally on 145.206 mc, has 18 watts to a 522 Tx and a 4-element c.s. beam. The receiver is a 3-valve converter working into a BC648. He is frequently active between 1830 and 2000 and again after 2230. G3AHB (Slough) lost his 8-element stacked array in a recent gale and so has reverted to the original 4-element beam. Results have been quite good and he mentions that in north and south directions, where he has local hill obstructions, the Yagi is as good as a stack. He comments on the very good stability and sensitivity of the G2LQ converter.

G8LN (Plumstead) hopes to be active almost immediately and asks for reports. He has been doing much listening and experimenting with aerials, including rotation from horizontal to vertical with



The 430 mc pot oscillator now in use at G8VR. Valve is a 9002, the copper (petrol) pipe on the left takes the live heater lead to the valve and acts as cathode return, and the two resistors visible are anode decoupling and grid leak. The inner can is from a CV173 and the outer is an old valve screen. Stability is excellent and output coupling is by means of a hairpin loop in a hole drilled into the pots.

interesting results. He wishes there were not so many DX hunters who appear not to wish for local contacts! G5DS (Surrey) sends a list of 39 locals, i.e., in and around London, worked and another 39 heard during the past four weeks. In addition, he has worked 11 and heard 15 stations at more DX locations. That seems to make 104 altogether, which indicates some activity, anyhow!

Apologies to G5PY (Clapham Park) for failing to raise him to 21 counties in the Annual Table of Counties Worked. He would have liked to see the Contest extended to all VHF and UHF bands. G4HT (Ealing) hopes the Contest will brighten up the band and says he cannot escape the conclusion that there is less activity this year than last. G8VR (Abbey Wood) was another to work DL4XS/3KE, and he also knocked off F8JR on October 5. His station score has reached 112, but cards received are only 55. G5LQ (Chiswick) has returned

**TWO METRES**  
**ALL TIME COUNTIES WORKED LIST**  
**Starting Figure, 14**  
**From Fixed QTH only**

Worked	Station
49	G2OI (150)
46	G3BLP (330)
43	G3EHY (192), G5WP, G6NB
42	G3COJ (129)
41	G2NH (283), G5MA
40	G3ABA (151)
39	G6XM (208)
38	G2IQ, G3WW, G4HT (289), G5BY
36	G2XC, G3CGQ, G3CXD
35	G4LU, G6LK
34	G3VM, G4AU (201), G4DC, G5BM, G8SB
33	G3DMU (115), G5JU
32	G3BK, G8WV
31	G2CPL (168), G2XS (136)
30	G2CIW (221), G8SM (172)
29	G5NF, G8IP (207)
28	G6VC, G8IL (131)
27	G3DAH, G8QY
26	G2ADR, G2FNW, G3BW, G3BHS, G3FLJ, G6UH (212), G8QC (126)
25	G6WT
24	G3FXG, G8KL
23	G2NM, G3AVO/A, G3BOB, G3GSE (153)
22	G4RK, G6CI, G5DS
21	G2FMF, G5PY
20	G3GBO (152), G8KZ
19	G5SK, G6CB
18	G3AKU, G8VR, GM3OL
17	G3ANB, GM3BDA
16	G4LX, G5LI (121), G5LQ, G5MR, GW5SA
15	G2ANT, G2AVR, G4RX, G4MR
14	G2AHP (125), G2HDZ, G3CAZ, G4NB

*NOTE : Figures in brackets after call are number  
of different stations worked : Starting figure, 100.*

to 2 metres after a spell of experimenting with half-a-watt on 80 metres. The same VHF equipment is still in use, but a new Tx which will avoid 48 mc and TVI is under consideration.

G<sub>3</sub>BLP (Selsdon) reports calling CQ on Two, and being answered by a station on 70 cm, G<sub>3</sub>BLP hearing him on his sub-multiple, and G<sub>3</sub>BLP's harmonic being 559 in North London! The 16-element stack at G<sub>3</sub>BLP came down recently, and has now been erected again, but minus the reflectors. He has found conditions to be generally poor, although he had a contact with G<sub>3</sub>DRG/A in Waddington (Lincs.) on September 29. G<sub>3</sub>GHS (New Malden) has a 6AK5 type converter running into an AR88 on 5 mc; his beam is a 4-element Yagi. G<sub>3</sub>GHS wants some new counties badly, but has worked F8MX.

G<sub>3</sub>GBO (Denham) is now in, his correct part of the band according to the Zone Plan, and can be found on 144.78 mc. He has worked F8MX twice, and the schedule with G<sub>3</sub>EBW (Hurst Green) is proceeding according to plan; he reports that G<sub>3</sub>GIY (West Hyde) will be operating on Two very soon.

G<sub>3</sub>WW (Wimblington) missed the DL's in September, but found some compensation in working several more counties for the new yearly Table. He reports G<sub>2</sub>UQ as active in Whittlesey, Cambs.; G<sub>2</sub>AIQ (Cambridge) has a lazy-H with reflectors.

G<sub>3</sub>ABA/P used a 24-element array for the Coventry VHF Group Field Day. They operated from a site 400 feet a.s.l. and had the beam up another 52 feet. Conditions were fair, and although they failed to raise G<sub>2</sub>XC (who was S9 plus), they worked ON4BZ in Brussels. They ask for apologies to be passed on to the Northern stations, as they just did not get round to turning the beam that way! The biggest surprise was the lateness and earliness of the activity on Two; their last contact at night finished at 0130, and the first in the morning was at 0730, which indicates a very good spread in terms of time.

G<sub>2</sub>CDB (Chester) has an SCR522 Tx and a G<sub>2</sub>IQ converter. An 829 PA with 60 watts is nearly ready for operation. For 90% of the time G<sub>2</sub>CDB will be beaming South, as his beam is not readily rotatable; he mentions G<sub>3</sub>ATZ, G<sub>3</sub>FMI and G<sub>4</sub>OS as also active in Chester. G<sub>2</sub>OI (Eccles) found conditions very poor during the month. There has been continual rain and only an occasional night when Southern stations

could be heard. However, a new county in the shape of Denbigh relieved the monotony. G8IC (Doncaster) expresses surprise at the speed with which his call appeared in the Activity List, as he had not even written to us. It must have been one of our spies! Now we have first-hand information that he is on Two most evenings from 1900 to 2200. An SCR<sub>522</sub> feeds a cubical quad with RF, and the G2IQ converter is in use as receiver.

GW<sub>3</sub>KY (Isle of Anglesey) asks those interested in his sort of DX not to despair, as he will be on the air again soon, although 110 volt DC mains are a snag. G<sub>3</sub>EHY (Banwell) found conditions normally fair to good, the band always being open to at least 100 miles, and often to 220 miles. His best contacts were with G8GL (Northallerton) on October 5, and G2CPL (Lowestoft), S<sub>9</sub> phone, on October 7. G<sub>3</sub>EHY considers that location does not play a major part in working VHF DX, and quotes his own much-screened position as supporting evidence.

#### **Apology**

It is regretted that the "Best Twenty" Table was dropped last month without warning. Although there were only four entries for the Table, it was set for publication, together with a note to the effect that it had been decided to discontinue it for the future. Unfortunately, at the last moment, when it came to the make-up of the Magazine, it was found that there was insufficient room for all the material prepared for "VHF Bands," and this table was dropped as obviously having the least appeal.

#### **Congratulations**

The congratulations of us all to G<sub>3</sub>QC and G8DD, who have gone still higher to set up a new two-way record on 1250 mc. Signals at S<sub>8-9</sub> were exchanged over a 75-mile path between Merryton Low, 4½ miles north-east of Leek, Staffs., and Worcester Beacon, near Great Malvern, on October 1, from 1330 to 1430 GMT. This path is not line-of-sight. The previous record was between W1OFG/1 and W1MZC/1 over a 37-mile path. No details of the G<sub>3</sub>QC/G8DD equipment are yet available.

#### **Aurora and Other DX**

From W<sub>2</sub>PAU of *CQ Magazine* comes news of a large number of Aurora two-metre band openings during August. Their intensity was such that their influence was felt in practically all

latitudes of the USA, even as far south as Mississippi; best opening was on the night of August 19. One of the outstanding contacts was between W<sub>4</sub>AO and WØIHD over a distance of 887 miles. Some idea of the extent of the coverage is given by the log at W8WRN which included 6 W<sub>2</sub>'s, 6 W<sub>3</sub>'s, 5 W<sub>4</sub>'s, one W<sub>5</sub>, 15 W<sub>8</sub>'s, 12 W<sub>9</sub>'s, 2 WØ's and one VE3.

The troposphere has also been playing well over in W-land. On September 6 W<sub>2</sub>BAV, who operates a station 3000 feet a.s.l., found himself sitting in the middle of a duct (or something) and proceeded to work 25 W<sub>9</sub>'s, five WØ's and a flock of W<sub>8</sub>'s. His best DX was WØDSR at 1175 miles! All this was on phone and signals were all solid copy. This is undoubtedly a new tropospheric record for the band. The input at WØDSR was 12 watts! So perhaps that 3000 feet at W<sub>2</sub>BAV had something to do with it.

#### **Sayings of the Month**

"Further always further" (DL<sub>3</sub>KE) . . . "It is a pleasure to be back to the quiet of two metres" (G<sub>5</sub>LQ) . . . "I am still looking for 20 more counties" (G<sub>3</sub>WW) . . . "Some people go to bed late and some get up early, but very rarely the same person" (G<sub>3</sub>ABA) . . . "Why do some people refer to cavities? Don't they mean co-axial lines?" (G<sub>3</sub>GBO) . . . "I gather it has become a crime for a DX station not to return to a call" (G<sub>3</sub>BLP) . . . "My 4-element rotary is in the loft, i.e., nearly in the sea" (G<sub>2</sub>JU) . . . "The higher the frequency the fewer the contacts" (G<sub>4</sub>HT) . . . "It is more blessed to transmit than to receive" (G<sub>4</sub>HT) . . . "There seems a tendency for some stations to be DX hunters and not to work a local for a second time" (G<sub>8</sub>LN) . . . "PAØPN heard a phone station using frequency 435.7 mc and PN was beaming west. This must have been a G; if only stations would use CW on signing!" (PAØLU) . . . "Contest rules have been QSP'd. I will try to win this time." (PAØLU).

#### **Fiveband Club**

Numerous enquiries have been received regarding the holding of a Club Dinner in London. It is certainly hoped to arrange such an event again this winter, but it has been found impracticable to fix it in conjunction with the Amateur Radio Exhibition, as was done last year. Notice of the arrangements will be given as soon as possible, and if any wish to

be notified of the details care to let your conductor know, then full particulars will be sent by post.

New members continue to be enrolled in the VHF Century Club, and include G2ANT, G2AOL, G3GBO and G4AU during recent months. This may be a suitable time to remind applicants of the requirements of membership. It is necessary to send 100 cards confirming contacts made in the post-war period on frequencies above 50 mc. Stations may be worked once on each band, and portables count as well as fixed stations. When you send your cards you must include a signed statement that you have replied 100% to all cards you have received and will continue to do so. One further point—you must be a member of the Fiveband Club before your application for the VHF CC can be accepted. Membership of the Fiveband Club is open to all VHF operators on receipt of an undertaking to support and encourage VHF activity.

#### In Conclusion

In these days of printing difficulties, receipt of your letters and reports in good time each month becomes a matter

TWO METRES COUNTIES WORKED SINCE SEPTEMBER 1 Starting Figure, 14	
Worked	Station
26	G4HT
24	G3EHY
19	G2XC, G5DS
18	G3WW

*Note: This table will run for one year to August 31, 1951.*

of even greater importance, and your support in that sense will be greatly appreciated. Next month's mail should be addressed to E. J. Williams (G2XC), *Short Wave Magazine*, 53 Victoria Street, London, S.W.1, by November 16 latest. It is tight, but we hope to be on an even keel again by the time the next issue is due, on December 8.

#### AMATEUR TELEVISION TRANSMISSION

On October 25 the PMG announced in the House that amateurs will be permitted to transmit television on the bands 2300 to 2450, 5650 to 5850 and 10,000 to 10,500 mc. Though this is a concession wrung from the authorities after a hard fight by the interested parties, the bands allotted have themselves yet to be developed for amateur working, apart from the problems inherent in any possible TV receiving system at such frequencies.



#### USEFUL INSULATING MATERIAL

Readers may be interested to know that the great firm of I.C.I. are now marketing a product known as Alkathene, which has electrical properties in the same category as polythene. The material is made up in sheet, in all thicknesses from .0015-in. to 0.25-in. and in tube, in diameters of from  $\frac{1}{4}$  in. to  $1\frac{1}{2}$  in. It is light, hard, durable, semi-transparent, easy to work and finished smooth.

#### OPPORTUNITIES IN CANADA

It is reported that TV set manufacture is a rapidly growing industry in Canada, where the aim is to produce a home receiver in direct competition with the United States. Many large electrical companies are willing to train men who are adaptable, and there is plenty of work for experienced TV service and maintenance engineers. Readers who may be interested in this proposition can find out all about it on application to the Immigration Department, Ontario House, 13 Charles II Street, London, S.W.1.



#### U.N. TELECOMMUNICATIONS

It is reported that H. B. Rantzen, lately head of the BBC's Engineering Designs Department, has been appointed Director of Telecommunications Services to the United Nations. This is a most important post, carrying responsibility over a wide field—from PA facilities at U.N. conferences to the technical supervision of short-wave news and information broadcasts in some 23 different languages.

# Here and There

## The Amateur Radio Exhibition

The Fourth Annual Exhibition organised by the Radio Society of Great Britain will take place during the period November 22-25 at the Royal Hotel, Woburn Place, London, W.C.1. More than 20 exhibitors are taking stand space, including ourselves; our Stand will be manned by staff members throughout the period of the Exhibition, and we hope to make personal contact with many readers, as in previous years. Admission is by catalogue, price 1s. at the door, and the show is to be opened at 2.30 p.m. on Wednesday, November 22, by Hugh Pocock, Esq., M.I.E.E., Managing Editor of our respected contemporaries, *Wireless World* and *The Wireless Engineer*.

## Autumn Call Book

This is now on sale, price 16s. post free, and is as ever the only available directory to the amateur radio stations of the world. The *Call Book* now carries some 50 columns of G call-signs, and the total number listed is about 6,200—still short of the possible, but if you have appeared in our “New QTH’s” at any time up to and including the issue of the *Magazine* for July last, you are in. We would particularly ask that all new callsign/addresses, and changes of QTH, be notified to us as soon as may be, so that each quarterly appearance of the *Call Book* is as up-to-date with the G section as publication and distribution allow. We are, of course, not ourselves the publishers of the *Radio Amateur Call Book*—it is an American undertaking now in its 28th year—but we are the agents for the G section. You can obtain your copy from Gage & Pollard.

## Slight Correction

With reference to G6TA’s useful article on Super Modulation in our last issue, he notes that in case any of the old hands thought that the metres M<sub>2</sub> and M<sub>3</sub> should be by-passed, they would be right—the correct value is .01  $\mu$  F.

## Courses for Amateurs

We are informed that two Courses likely to be of interest and practical

value to amateurs can be taken at the Brentford Evening Institute, Boston Manor Road, Brentford, Middlesex. These are the Radio Service Course under J. H. Gibbons, of E.M.I., and the Radio Amateurs’ Course (preparation for the 1951 R.A.E.), for which the tutor is E. J. Pearcey, G2JU, of the same organisation. The fee for either Course is but 10s., and application should be made to the Principal of the Institute, at the address given.

## Esperantists’ Opportunity

From G<sub>3</sub>ESP we hear that the Universala Klubo de Radio-Esperantistoj has been revived with the object of bringing together those concerned with radio, either professionally or as amateurs, who are also interested in making use of Esperanto as a universal language. News and information will appear in *La Interligilo* and readers who would like to pursue the matter should communicate direct with: R. Filiatre, U.K.R.E., 46 Rue Lamartine, Paris IX, who will be glad to hear from transmitters and SWL’s.

## Electrical Silence

Our bands are now afflicted with noise QRM of many different kinds, nearly all man-made. In residential areas much of it is caused by household vacuum cleaners, hair dryers, automatic irons and similar devices. Of them all, the vacuum cleaner is the worst because it is the commonest. In one household that we know, the matter has been tackled as a problem to be solved—the first step being to insist that the manufacturer supplies his product fully suppressed. If every amateur did this, and advised his non-radio friends to do the same, we should begin to make an impression, and the Committee concerned within the industry would have to define the standards for suppression. And for the record—and because it is marketed as being fully suppressed—readers will find that the GEC’s Electric House Cleaner Type DM.370 is absolutely noise-free electrically, and can be used in the same house as receivers working over the whole range BC bands to 145 mc without causing any interference.

# The Month with the Clubs

FROM REPORTS RECEIVED

Increasing activity is shown by the fact that 34 Clubs have reported this month. Most of them are well into their "winter" programme of lectures, demonstrations and discussions, the season of Field Days and outings being over.

In addition to these reports, we have received the following Circular Letters and News Sheets: *Brighton Link*, *CQ-CF* (Cardiff), *MARS News Letter*, Sunderland Radio Society *News Letter*, Sutton and Cheam Radio Society *News Letter*, *The Radio Link* (West Cornwall), West Somerset Radio Society *News Letter*, and Wirral Amateur Radio Society *News Letter*.

Clubs are all keyed up for the Fifth Annual MCC, which starts at 1700 on November 11 and continues, between the hours of 1700 and 2300, until the latter hour on November 19.

The following stations will be definitely on the air, although we do not consider that this list represents the full strength of the contestants:—

G2AMV, Wirral	G3FYD, Guilford, Nottingham
G2BOI, Tyneside	G3GEC, G.E.C., London
G2FJA, Medway	G3GFA, Sutton and Cheam
G2YS, Chester	G3GHN, Clifton, London
G3ASR, Edgware	G3GRS/A, Gravesend
G3AXP, Baldock	G4BP, Scarborough
G3BTP, Slough	G8TB, Surrey
G3CKR, Warrington	G8TS, Farnborough
G3DIY, West Cornwall	GC2FMV, Jersey
G3EIW, Plumstead and Woolwich	GM3HAM/P or GM8FM, Edinburgh
G3EKW, Nottingham	GM6RI, Forfar
G3ERD, Derby	GW3EOP, Neath
G3FAB, Coventry	GW3FFE, Rhigos
G3FKF, Salisbury	

Closing date for next month's Club Notes will be November 14, and, for the month following, December 12. Please get your reports in on or before these dates, addressed "Club Secretary," *Short Wave Magazine*, 53, Victoria Street, London, S.W.1. And remember that we shall be wanting the MCC entries by December 1.

**Baldock District Radio Club.**—All members of the RAE course passed the examination, which speaks well for the course! Four more have obtained their tickets and are on the air. A stand was run at the Arts and Crafts Exhibition in Baldock Town Hall, where a Tx was in operation and members' gear on exhibition. New Club HQ will be opened shortly; meanwhile instructional meetings are held each first Wednesday evening at the Baldock Senior School.

**Barnsley and District Amateur Radio Club.**—At the meeting on October 13 the syllabus was discussed and a programme arranged to last until July 27, 1951. There will be lectures on Modern Receiver Design, also on Transmitter Design, Power Supply Considerations, Aerials and Feeders, Hi-Fi, NFM, Frequency Measurement, Station Planning, and "Gimmicks and Gubbins." The Receiver Design lectures start on November 10.

**City of Belfast YMCA Radio Club.**—The AGM was held in September; reports were submitted and officers elected for the forthcoming year. Twenty students passed the RAE examination, thanks to the special course run by the Belfast Technical College. GI6YM will be on the air during this season with two full-power transmitters—one CW and one phone. Morse classes will be run on Tuesday and Wednesday nights, with a full programme of events of all kinds.

**Birmingham and District Short Wave Society.**—Membership is steadily growing and visits are being arranged to local places of interest. Recent

lectures have covered Receivers for Two-to-Five Metres, and Transmitters for Beginners. A small nucleus of members is doing very good work, and it is hoped to rope in all the local members of the BSWL.

**Brighton and District Radio Club.**—The new HRO receiver is now performing well, and QSO's from the Club Station are a little more frequent. It operates on alternate Tuesdays, when an informal evening is held. Future events include a Hamfest, a talk by G2MC on Two Metres, and participation in a local Exhibition.

**Cambridge Amateur Radio Club.**—The next meeting will be on November 24, 8 p.m., at The Jolly Waterman. The evening will be given over to a Junk Sale. A hearty welcome is extended to all American amateurs stationed in the district.

**Chester and District Amateur Radio Society.**—Last month the Club welcomed G2AMV (from Wirral), who gave a well-demonstrated talk on VFO's. The last lecture was by G2YS on the subject of TVI and How to Cure It. Two Americans were welcome visitors, one of them being W5FTK. Meetings are held in the Club HQ—Tarran Hut, YMCA Grounds. Morse classes are at 6.30 and official meetings at 7.30 p.m.

**Clifton Amateur Radio Society.**—Meetings have been well attended and the attendance record broken. Recent events have been a Discussion on "MCC," a lecture on Radio in the Berlin Air-Lift, and a Junk Sale. An SWL Contest is in progress. Membership is now 45 and includes 15 licensed amateurs.

**Edinburgh Amateur Radio Club.**—At the AGM a new committee was elected, consisting of three transmitting members and two listeners. The subscription has been reduced, and the committee is drawing up a full programme which will include, during the next two months, a Junk Sale, a Quiz Night and a demonstration of UHF. A portable licence is being taken out, chiefly for 420 mc purposes. Contests will be organised during the early part of the season and a trophy awarded.

**Edinburgh (Lothians Radio Society).**—Fortnightly meetings continue at 25 Charlotte Square; forthcoming dates are November 2, 16 and 30, December 14 and 28. There will be a talk on a Ten-Metre Beam, one on Uses of the CRO, and Morse Instruction classes. Prospective members will be welcomed at all meetings.

**Grafton Radio Society.**—At the Fifth AGM the new committee was elected, consisting of the President (B. Randall, GW3ALE), four Vice-Presidents (C. T. Bird, A. E. Mitchell, G8DF, J. A. Reading, G3RX and P. Beresford), Chairman (A. W. H. Wenwell), Vice-Chairman (J. H. Clarke, G2AAN), Hon. Sec. (W. H. C. Jennings, G2AHB), Hon. Asst. Sec. (J. Moran, G3CLV), Hon. Treasurer (R. T. White), Hon. Storekeeper (P. Vasey), two Committee Members (H. Hudson, G3FVL and P. Beresford) and two Hon. Auditors (J. J. Hollington, G4GA and D. Outram).

**Gravesend Amateur Radio Society.**—The winter session has begun and a big programme is under way. After the success of the debate "CW v.

Phone," another one on "QRO v. QRP" has been arranged. It is hoped to arrange more demonstrations with the lectures in future, as these seem to hold an audience more successfully.

**Grimsby Amateur Radio Society.**—This Club is being re-formed under the new name of Grimsby Amateur Radio and Television Society. Efforts are at present concentrated on a Top Band phone transmitter, which will have its first "airing" shortly. Attendances are improving, but there is a noticeable shortage of Old Timers. The Club room, from which the MCC transmitter will operate, is at Block 50, Welholme Road, Grimsby.

**Kenilworth Radio and Television Society.**—The first AGM was held recently, officers and committee being elected. Talks and demonstrations have been given by G5PP and G4KC, both of Coventry. A licence has been granted by the GPO, and the call-sign is awaited. Headquarters are in Dalehouse Lane, Kenilworth, where meetings are held every Wednesday at 8 p.m. Visitors will be welcomed.

**Lincoln Short Wave Club.**—Members paid a successful visit to GKZ and an Automatic Telephone Exchange on September 10; on the 27th there was an enlightening talk on The Decibel; on October 11 a debate on "Straight versus Super Rx," and Mullard Film Strips were shown on October 25. Forthcoming events: A talk on Aerials by G6TV, from Cranwell, on November 8, and another Mullard Film Strip on November 22. Finally—the Annual Dinner on December 6. Meetings are now held every Wednesday, alternating between

Morse classes and the normal programme.

**Midland Amateur Radio Society.** — MARS were unanimous in electing, as President, Mr. A. W. Rhodes, who has served so long as Secretary. The retiring President, G6DL, received the thanks of the Club after a very successful year, and Mr. B. Bligh is the new Secretary (QTH in panel).

**Neath, Port Talbot and District Amateur Radio Club.** — Five of the eight candidates were successful at the last RAE, and it is hoped to continue, this winter, with a course for next year's candidates. The AGM was held on October 11, and the programme for the coming season drawn up.

**North Kent Radio Society.** — After a quiet summer this Club is now going ahead with its winter activities. The Club Rx has been completed, the Tx has had its first airing, and the first portable outing, using G3ENT/P, was enjoyed by members and friends. It is hoped to add a modulator to the Tx and to operate phone in the near future. Meetings will be held on the 2nd and 4th Mondays throughout the winter, at the Freemantle Hall, Bexley.

**Nottingham Short Wave Club.** — Arrangements have been changed since the last notes appeared, and meetings are now held every Wednesday, 7.45 p.m. at The Old Boys' Club, Middle Street, Beeston, Nottingham. See panel for new Secretary's QTH.

**Paisley Short Wave Club.** — This Club now has 10 transmitting members, and in anticipation of TVI troubles in the future, GM4KM is starting a series of lectures on the subject. New members will be wel-

comed to the meetings, on Saturdays at 7.30 p.m.

**Portsmouth and District Radio Society.** — Recent meetings have been well attended, and lectures on Audio Filters and Frequency Measurement followed with keen interest. The Club Tx, G3DIT, has made many DX contacts, despite poor conditions, and another transmitter, G3CLX/A, was operated at the Mecanno Club Exhibition. A future event is to be a visit to the local telephone exchange.

**QAU Club, Channel Islands.** — Most of the meetings have been devoted to discussions on MCC, for which the Club is entering under the call GC2FMV. Two members have now become interested in the UHF bands, and hope to put Jersey on the map among the GDX on these bands.

**Ravensbourne Amateur Radio Club.** — This club meets twice weekly at the Deptford Men's Institute, New Cross. A transmitter is being built and a club call-sign awaited, together with a portable call for week-end Field Days. An instructor is wanted for the Theory and RAE section, but the Rx, Tx, Morse and Constructional sections are already in action. All new members, SWL's and beginners alike will be welcomed.

**Reading Radio Society.** — Recent talks have covered the subjects of FM Reception and Electronics; future events include talks on Electronics (Part IV.), Intercom., a C. & G. Quiz, and "In Lighter Vein." November meetings are on the 9th and 25th, with the Instructional Section meeting on November 11 and December 9. The Hamfest will take place on November 26.

**Rhigos and District Radio Club.** — Meetings are held on the second Thursday of each month, at the Black Lion, Victoria Square, Aberdare. A recent successful lecture was on Reception of Television in Fringe Areas. GW3ZV, the President, was congratulated on being the highest European scorer in this year's ARRL DX Contest, and GW3FFE are grimly determined to win this year's MCC and thus to pull off the Hat Trick.

**Richmond and District Radio Society.** — The October meeting was well attended, and the subject was a talk and demonstration on Aerials, given by G4GD. November meetings, which are on the 1st and 29th, will be held at the Richmond Community Centre at 7.30 p.m.

**Romford and District Amateur Radio Society.** — G3BNI, the former Hon. Sec., has resigned his duties owing to business reasons; the new Secretary is G3DNL—see panel for his QTH. The Club has started its winter programme and attendances are improving after the slack season. The month's programme includes a Junk Sale, a talk on The Care of Tools, and a TV Lecture.

**Salisbury and District Short Wave Club.** — The new premises were formally opened on September 26 by the Rt. Hon. the Earl of Pembroke, accompanied by the Mayor of Wilton. Both guests spoke of their association with wireless in its infancy. Lord Pembroke and the Mayor were presented with their membership certificates as President and Vice-President respectively, and the evening ended with a demonstration of the Club's equipment. Meet-

ings are now held on Tuesdays and Thursdays at 7.30 p.m.

**Sheppen Amateur Radio Society.**—This club meets every Friday, 7 p.m. in the Sports Pavilion at Holm Place. The recently-acquired receivers are working well, and a Morse class continues for anyone requiring tuition or practice. Application will be made for a Club licence in the near future, and a transmitter is being designed in readiness for this. New members will be welcomed, either at the meetings or via the post to the Secretary.

**Stourbridge and District Amateur Radio Society.**—A meeting was held at King Edward VI. School, Stourbridge, on October 3, when Mr. F. Bills, G3CLG, gave an illustrated talk on Thermionic Valves—Theory and Technique.

Members showed keen interest.

**Torbay Amateur Radio Society.**—At the September meeting members congratulated G3AVF, the Secretary, on finishing top of the list in the Two-Metre Field Day contest, and G2BMZ on his 520-mile contact, establishing a new record for Two-Metre European working. The formation of a local network and the forthcoming MCC were also discussed. October will see the opening of a new feature, "The Month on the Bands." Two Cups are to be competed for annually—one for the best constructional item and one for the outstanding VHF achievement.

**Wakefield and District Amateur Radio Society.**—Forthcoming events include the following: November 15, talk on Design of Quality Ampli-

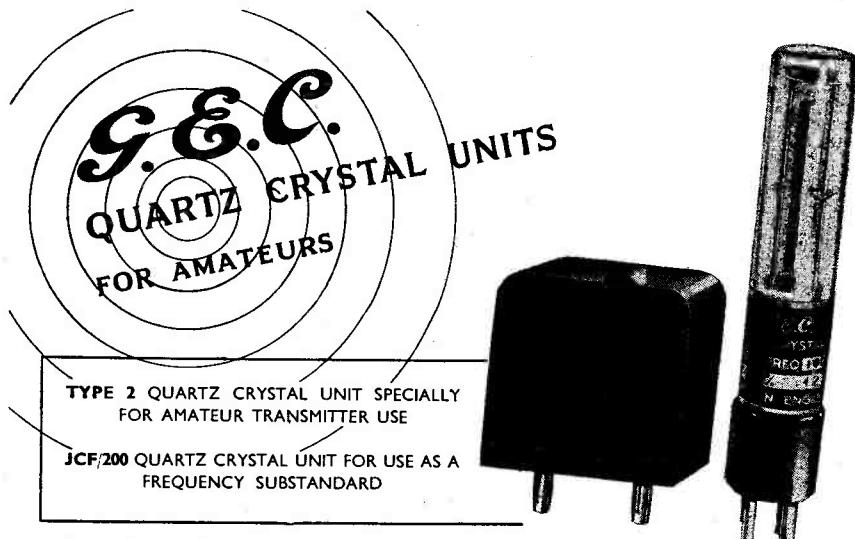
fiers; November 29, Film Strip, Construction and Manufacture of Radio Valves; December 13, Introduction to FM. All meetings are at 7.30, Service House, Providence Street, Wakefield.

**Wandsworth and District Radio Club.**—The first meeting of the season, in September, was devoted to a general rag-chew. The season's programme has been arranged, and the next meeting is at 8 p.m. on November 15, at the Waldron Road School, Garratt Lane, S.W.18. All interested are very welcome.

**Warrington and District Radio Society.**—The inter-club Top-Band telephony contest on September 24 was very successful, with many stations participating. A presentation will be made at the Annual Dinner, which takes place at the end of November.

#### NAMES AND ADDRESSES OF CLUB SECRETARIES

- BALDOCK :** E. W. Edwards, G3FYG, 164 Icknield Way, Letchworth.
- BARNSLEY :** J. J. Rose, 21 Swift Street, Barnsley.
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- BIRMINGHAM :** E. G. Evans, 4 Cotford Road, Kings Heath, Birmingham 14.
- BRIGHTON :** L. Hobden, 17 Hartington Road, Brighton.
- CAMBRIDGE :** T. A. T. Davies, G2ALL, Meadow Side, Comberton, Cambridge.
- CHESTER :** R. Windsor, 17 Hough Green, Chester.
- CLIFTON (S.E. LONDON) :** W. A. Martin, G3FVG, 21 Brixton Hill, S.W.2.
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- LINCOLN :** G. C. Newby, G3EBH, 10 Addison Drive, St. Giles, Lincoln.
- MIDLAND :** H. B. Bligh, 52 Norman Road, Birmingham 31.
- NEATH AND PORT TALBOT :** W. R. Petheram, GW3CIJ, 7 Tynyrheol Avenue, Tonna, Neath, Glam.
- NORTH KENT :** L. E. J. Clinch, 8 Windsor Road, Bexleyheath.
- NOTTINGHAM :** D. C. G. Johnson, G3EGE, 16 Lorne Grove, Woodborough Road, Nottingham.
- PAISLEY :** J. MacArthur, 9 East Buchanan Street, Paisley.
- PORTSMOUTH :** R. Short, G3AFF, 76 Roman Grove, Portchester, Hants.
- QUA, Channel Islands :** Miss Valerie Hunt, Woodshiel, Millbrook, St. Lawrence, Jersey.
- RAVENSBOURNE :** Hon. Sec., R.A.R.C., Deptford Mens' Institute, Chideric Road School, London, S.E.14.
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2½-3-3ins.	...	...	...	...	15/6
250-0-250v	100m.a.	6.3v 6a,	5v 3a	(For 1355 Conv.)	
250-0-250v	100m.a.	6.3v-4v 4a	C.T.	0-4-5v 3a	23/9
300-0-300v	100m.a.	6.3v 4a,	5v 3a	...	21/9
350-0-350v	100m.a.	6.3v-4v 4a	C.T.	0-4-5v 3a	21/9
350-0-350v	120m.a.	6.3v-4v 4a	C.T.	5v 3a	25/-
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425-0-425v	200m.a.	6.3v-4v 4a	C.T.	6.3v-4v 4a	...
4a C.T. 0-4-5v 3a	...	...	...	42/6	

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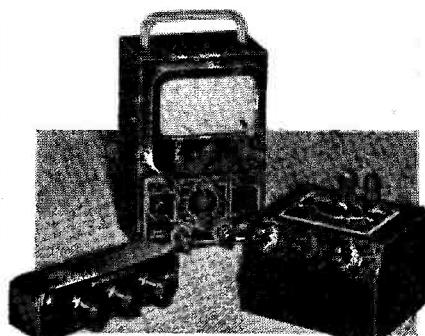
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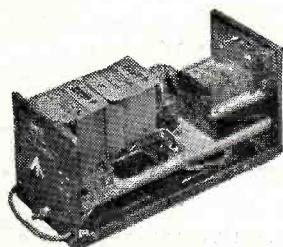
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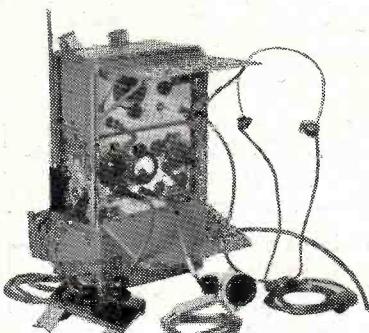
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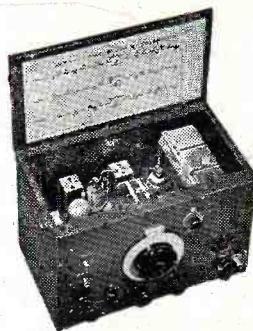
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