

**Silver Jubilee
Number**

R.S.G.B.



BULLETIN

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VOLUME 26 No 1

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JULY 1950

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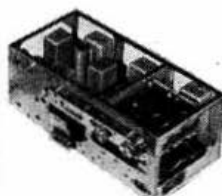
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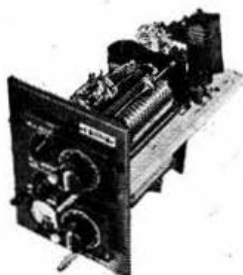
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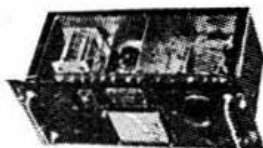
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LITTLE RUSSELL STREET,
LONDON, W.C.1

Telephone: Holborn 7373



Advertisement Manager:

HORACE FREEMAN

Advertising Office:

PARRS ADVERTISING LTD.,
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Issued free to members. Hon. Editor: ARTHUR O. MILNE

Published on or about the 15th of each month.

Forthcoming Events

REGION 1

Ashton-under-Lyne.—August 6, 3 p.m., New Jerusalem Schools.
Blackpool.—July 18, August 15, Chamber of Trade Building, Queen Street.
Bolton.—August 1, 8 p.m., Y.M.C.A.
Bury.—August 3, 7.30 p.m., Y.M.C.A., The Rock.
Darwen and Blackburn.—July 28, August 11, 7.30 p.m., Y.M.C.A., Limbrick, Blackburn.
Manchester.—August 7, 7.30 p.m., Reynold's Hall, School of Technology, Sackville Street.
Oldham.—Alternate Wednesdays, 7.30 p.m., Civic Centre, Clegg Street.
Preston.—July 21, August 4, Three Tuns Hotel, North Road. Also *Hidden Transmitter Hunt*, September 3. All welcome.
Rochdale.—August 6, 3 p.m., Drill Hall, Baron Street.
Southport.—July 17, 8 p.m., 38a Forest Road.
Wirral A.R.S.—July 19, August 2, 8 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—July 28, August 11, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—July 25, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., Club Room, British School Yard, Skinnergate.
Doncaster.—July 26, 7.30 p.m., Leopard Hotel.
Gateshead.—Thursdays, 7 p.m., Y.M.C.A., Sutherland Hall, Durham Road.
Hull.—July 26, 7.30 p.m., R.E.M.E. Barracks, Walton St.
Leeds.—Fridays, 7.30 p.m., Swathmore Settlement, Woodhouse Square.
Middlesbrough.—Thursdays, 7.30 p.m., All Saints Hall, Grange Road.
Newcastle-upon-Tyne.—July 24, 8 p.m., British Legion Rooms, 1 Jesmond Road.
Scarborough.—Thursdays, 7.30 p.m., L.N.E.R. Rifle Club, West Parade Road.
Sheffield.—July 26, 8 p.m., Dog and Partridge, Trippet Lane, August 9, 8 p.m., Albreda Works, Lydgate Lane.
Spenborough.—July 19, August 2, 7.30 p.m., Temperance Hall, Cleckheaton.
Wakefield.—July 26, August 9, 7.30 p.m., Carr Lodge Park, Horbury. (In Café if wet.)
York.—Wednesdays, 7.30 p.m., Community House, Falsgrave Crescent.

REGION 3

Coventry.—July 21, 7.30 p.m., Priory High School, Wheatley Street.
Birmingham (South).—August 6, 20, 10.30 a.m., Stirchley Institute.
Birmingham (M.A.R.S.).—July 18, 6.45 p.m., Imperial Hotel. No meeting during August.

REGION 4

Derby (D. & D.A.R.S.).—July 19, 26, August 2, 9, 16, 7.30 p.m., Clubroom No. 4, School of Art, 119 Green Lane.
Leicester (L.A.R.S.).—July 17, August 21, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.

Loughborough.—August 9, 7.30 p.m., Science Lab., Limeshurst School.
Mansfield (M. & D.A.R.S.).—August 13, 3 p.m., Swan Hotel.
Northampton (N.S.W.C.).—July 21, 28, 6 p.m.; August 4, 7 p.m.; August 11, 6 p.m., Club Room, 8 Duke Street.
Peterborough.—August 1, 7.30 p.m., St. John Ambulance H.Q., Cowgate.
Retford.—August 6, 3 p.m., 8a Bridle Gate.
Spalding.—July 27, 7.30 p.m., 10 South Parade.

REGION 5

Chelmsford.—August 1, 7.30 p.m., Smith's Radio Shop, Moulsham Street.

REGION 7

Barnes & Richmond.—August 8, 7.30 p.m., 22 Lowther Rd., Barnes.
Brentwood.—July 21, August 4, 8 p.m., Drill Hall, Ongar Rd.
Croydon (Surrey R.C.C.).—August 8, 7.30 p.m., Blacksmiths Arms, South End.
Edgware (E. & D.R.S.).—Every Wednesday, St. Michael's School, Flower Lane, Mill Hill.
Enfield.—July 16, 3 p.m., George Spicer School, Southbury Road.
Erith & Dartford.—August 14. No venue given.
Finsbury Park.—July 18, 7.30 p.m., 164 Albion Road, Stoke Newington, N.16.
Hayes & Uxbridge.—August 4, 7.30 p.m., The Vine, Uxbridge Road.
Hoddesdon.—July 20, August 17, The Salisbury Arms.
Lewisham.—July 17, 8 p.m., "Anchor," Lewisham Road, S.E.13.
St. Albans.—July 26, August 9, 8 p.m., The Beehive, London Road.
Slough.—July 20, August 17, 7.45 p.m., The Golden Eagle Hotel, High Street.
Sutton & Cheam.—July 18, Sutton Adults' School, Benhill Avenue.
Watford.—July 18, August 1, Cookery Nook, The Parade.
Welwyn.—August 1, 8 p.m., Council Chambers.

REGION 8

Brighton.—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Road.
Guildford.—No meetings in July.
Southampton.—August 5, 7.30 p.m., 22 Anglesea Road, Shirley.
Reading (R.S.).—July 13, 29, Main Society, 7 p.m., Abbey Gateway; July 15, August 12, Instructional, 7 p.m., Abbey Gateway.
Worthing.—August 27, Sussex Bucket & Spade meeting, Contact T.R. for further details.

REGION 9

Exeter.—August 4, 7 p.m., Y.M.C.A., 41 St. David's Hill.
North Devon.—August 4, 7.30 p.m., Rose of Torridge Café, The Quay, Bideford.
Torquay.—July 21, 7.30 p.m., Y.M.C.A., Castle Road.
Plymouth.—July 21, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Weston-super-Mare.—August 1, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 14

Ayr.—July 26, 7.30 p.m., Royal Hotel, Prestwick.
Falkirk.—July 28, 7.30 p.m., Temperance Cafe, High Street.
Glasgow.—No meeting in July.

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PREMIER RADIO COMPANY

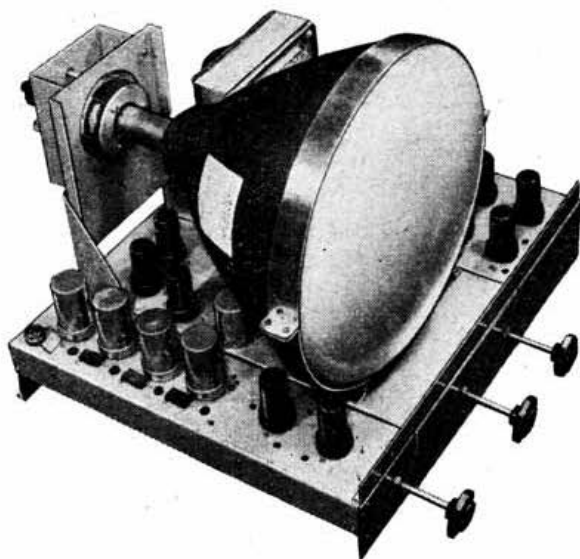
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The Vision Receiver consists of 4 R.F. stages (EF54's) which are followed by a Diode Detector and Noise Limiter (6H6) which is directly coupled to the Video valve (EF54).
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The Sound Receiver comprises 3 R.F. stages (6SH7's) followed by a Double Diode Triode (6Q7), which acts as Detector and L.F. Amplifier. A Noise Limiter (EA50) is also incorporated. The output valve (6V6) drives a 10" P.M. Moving Coil Speaker with closed field magnet, which is included in the Time Base.
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Complete Kit with valves £8-5-6
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The Power Supply is from a double wound mains transformer completely isolating the receiver from the mains. The H.T. Rectifier is a 5U4G.
Complete Kit with valves £4-16-6
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R.S.G.B.

BULLETIN

For the advancement of Amateur Radio

VOLUME XXVI No. 1

JULY 1950



FOR THE ADVANCEMENT OF AMATEUR RADIO

EACH month for the past twenty-five years a fresh issue of the BULLETIN has been published. Behind that simple statement lies what must surely be one of the most noteworthy achievements of the Amateur Radio movement in the United Kingdom: the foundation and unbroken publication for a quarter of a century of an independent members' journal devoted exclusively to the advancement of its cause.

When in 1925 a few eager enthusiasts, including such stalwarts as Bevan Swift, Cooper, Hambling, Marcuse and Royle, took the serious plunge of publishing—on behalf of the Transmitter and Relay Section of the Radio Society of Great Britain—the first slim 12-page BULLETIN, they could little have foreseen that their efforts were destined to have such far-reaching effects upon the progress and, one is tempted to add, the very existence of Amateur Radio in this country.

During the hectic days of the mushroom-like growth of broadcasting and short-wave communication, there was indeed a real danger that amateur transmission might be rapidly submerged. Powerful commercial interests were at work; threatening, in the general scramble for wavelengths, to crowd out those who had pioneered the development of "100 metres and below." The R.S.G.B. owes a great debt of gratitude to the *Wireless World* for the generous hospitality given in its columns, particularly during the early 'twenties and also both before, and since, to reports of Society activities. But nevertheless, by providing the amateur enthusiast with his own journal, the founders of the BULLETIN ensured the complete independence of the Amateur Radio movement: an independence which has been carefully preserved to the present day.

During these twenty-five years there have been many commercial magazines publishing information on amateur transmission and reception; and their contribution to the technical knowledge of our hobby should not pass unrecorded. But members will also recall that when, in 1939, the BULLETIN became, once more, the only "all amateur" publication in this country, it alone kept alive—during six years of war—the Spirit and Memory of Amateur Radio, and introduced the hobby to a vast number of new recruits.

Though the circulation of our journal has risen from less than 1,000 copies a month to roughly *fourteen* times that figure, its essential character and aims have remained unchanged. While, thanks to close co-operation between members, Technical Committee and Editorial Staff, the "BULL" has—as is shown elsewhere in this issue—consistently provided information on the latest technical developments, it has, at the same time, always been much more than just a technical magazine. The whole essence of Amateur Radio has been reflected within its columns: conventions; exhibitions; meetings; discussions; contests; official licence information; and members' activities. Just how many of the major changes in the structure and the social side of our hobby have first been brought to general attention through the medium of a "Letter to the Editor" or in the form of one of the short paragraphs or reports which have always been a prominent feature of BULLETIN make-up, is beyond computation.

No journal—and certainly not one which endeavours to cover all the many-sided interests of a large Society—can expect or hope to avoid occasional criticism. To do so could only mean that members had ceased to take a personal interest in its progress. But it is worth noting that—after twenty-five years—the most frequent complaint about the BULLETIN is that—in spite of its size having been *doubled* in the past three years—there is still not enough of

Continued on page 23

A TVI-PROOF 50-WATT TRANSMITTER

Introduction

THE need for amateur transmitting equipment designed specifically to give minimum harmonic output in the British television band has been apparent for some time and has been amply confirmed in the course of experimental work carried out by the writer. For, whereas in a great many cases existing transmitters may be successfully modified to incorporate the TVI devices previously described (1), there are, however, a large number of open rack or even "breadboard" types which, particularly in areas of low television field strength, do not lend themselves to satisfac-

By LOUIS VARNEY*

A.M.I.E.E. (G5RV)

tory modification. It was with these facts in mind, together with the knowledge that an even greater degree of harmonic suppression than that which can be reasonably expected from modification of a normal type transmitter would be required for successful TVI suppression in the "fringe" areas, that an attempt was made to design and construct a "TVI-Proof" R.F. unit which could be used either as a complete low or medium power transmitter or as an exciter for any 150-watt power amplifier. The resulting unit, which is described in the present article, has proved to be *completely* TVI-proof at a number of different locations (2) in Chelmsford. The experimental prototype has also enabled several successful demonstrations to be given at various locations in the course of lectures on TVI suppression. A third model, constructed by Mr. L. J. Fuller G6LB to the present design, has proved equally successful.

Some notes on the results obtained in a difficult "fringe" location (Cambridge) are appended.

* 184 Gallewood Road, Chelmsford, Essex.

Circuit Design

Care has been taken to avoid "trick" circuits which might prove difficult to construct or to adjust; and it must be emphasised that standard "popular" valve types only are used. The circuit diagram, shown in Fig. 1, calls for little comment except, perhaps, to stress the need for really short leads on all by-pass condensers (wherever possible these are soldered right across the valve socket and returned directly to the valve cathode pin); and the use of screened wire for all connections so marked. It is also important to select metal-type valves for the frequency multiplier stages or to provide screening cans where glass-type valves are employed.

The use of wide-band couplers as manufactured by *Labgear, Ltd.*, Willow Place, Cambridge, is a contributory factor to the successful reduction of unwanted harmonic components, because,

- (i) They constitute band-pass filter circuits with a high inherent discrimination against the transfer of unwanted harmonics from one stage to another.
- (ii) They form compact and *completely screened* LC circuits for the frequency multiplier stages.

Additionally, they provide the facility of rapid frequency-changing within any given band by reducing the number of tuning controls to the bare minimum: comprising, the V.F.O., 807 tank circuit, and the aerial tuning circuit. The band-switching system has similarly been reduced to the simplest possible form consistent with reasonable flexibility.

One interesting feature of this transmitter is that, because of the thorough harmonic suppression technique employed, the 807 stage is quite free from the parasitic oscillation troubles so often associated with high-gain tetrodes in R.F. circuits. It is, in fact, as "tame" as any correctly neutralised triode power amplifier.

It will be observed that the 807 valve is used

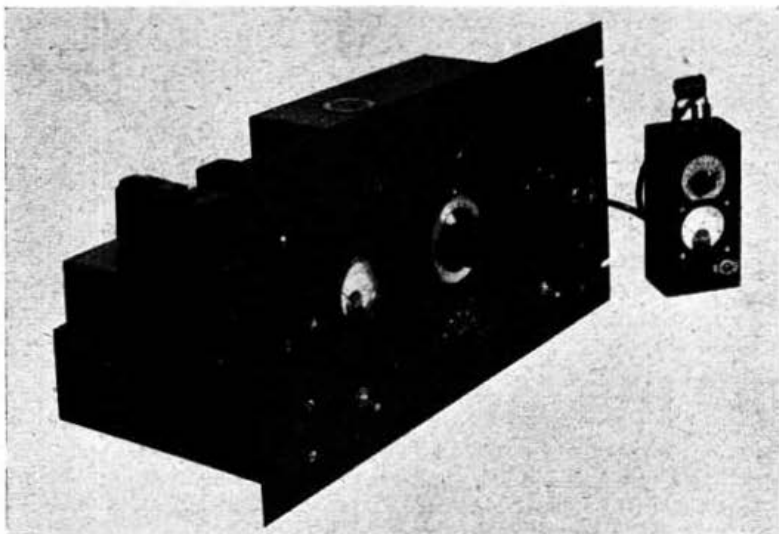


Fig. 2
General view of TVI-proof 50/75 watt, 3.5 to 28 Mc/s. transmitter. The harmonic monitor is shown plugged into the harmonic check socket.

as a power amplifier on all bands from 3.5 to 28 Mc/s. The second frequency multiplier valve, V3, functions either as a frequency doubler from 7 to 14 Mc/s. or as a tripler from 7 to 21 Mc/s.

The screen grid voltage clamper valve, V6, has proved a great asset in practice and avoids the necessity for a bias supply. For this reason, also, the frequency multiplier valves are provided with cathode bias and are arranged to "idle" in a class AB1 condition when undriven. It will be noted that the spare contacts on wafer "C" of Sw1 are used to maintain anode voltage on V3 in the 3.5 and 7 Mc/s. positions. The use of a 150-volt stabilised source for the V1, V2, V3 and V4 screen-grids is convenient but not essential. It does, however, ensure that the respective screens are maintained at a constant voltage despite variations in driving conditions: it also prevents an otherwise appreciable rise in screen volts when any particular valve or valves is quiescent. The regulator valve (V7) may be mounted in the power supply unit for the driver stages if desired.

The second VR150/30 (V8), was originally fitted so as to provide a stabilised source of 300 volts for the 807 screen-grid as an alternative to the clamper valve system should fixed grid bias be desired. V8 can, if not required, be dispensed with,

condenser. However, a warning must be given: if the harmonic monitor coil is unscreened (as shown in Fig. 2) this unit must *not* be left in circuit and tuned to an undesirable harmonic while actual transmission is in progress or there may be sufficient harmonic power re-radiated from it to be perceived on a near-by television receiver!

As a result of this effect—which is indeed an object lesson in TVI—the harmonic monitor at G5RV is being modified to provide suitable screening for the coil. This instrument will then be left in circuit, tuned to the undesirable harmonic, ready to give immediate warning should the residual harmonic content in the transmitter output rise above the normal level which, by local observation, has been found to be tolerable.

Auxiliary Crystal Control Unit

For those who require crystal control as an alternative to V.F.O. operation, or who may wish on occasion to use the transmitter as a completely self-contained R.F. unit, an auxiliary crystal oscillator has been designed as a separate demountable unit. It utilises a circuit which was developed by the writer some years ago and which has proved much superior to the more orthodox Tritet circuit;

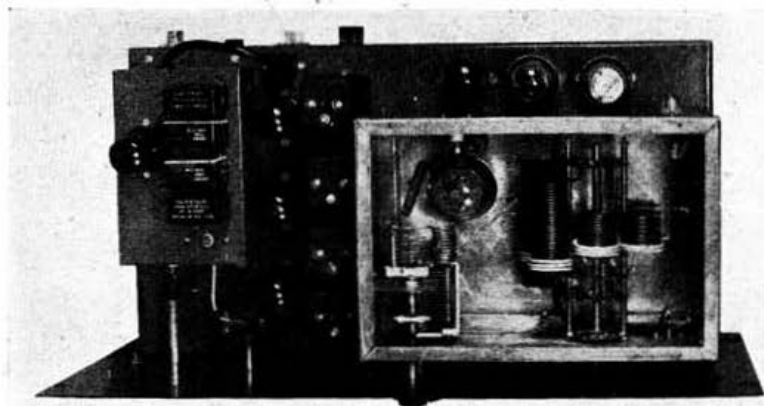


Fig. 3
Top plan view of the TVI-proof transmitter. Note:—The crystal frequencies are not as marked. The crystals have been ground into the 3.5 Mc/s. band.

Shunt feed has been used for the 807 stage to enable a tank condenser of small physical size to be employed. Incidentally, this arrangement confers a useful advantage from a TVI suppression viewpoint by providing a very low inductance earth return for the tank circuit; the rotor shaft of the tank condenser being bolted directly to the front panel of the P.A. screening box.

The coil turret shown in the accompanying photographs was home-made and coil details are given herewith; but for those who prefer to purchase a suitable turret the *Labgear* 35-watt type is recommended.

Harmonic Check Facility

A novel feature of the circuit is the provision of a special harmonic check point. This is clearly seen in Fig. 2, with the harmonic monitor unit plugged in. Reference to Fig. 1 will show the simple electrical arrangement of this facility. It is invaluable for correct adjustment of the harmonic trap circuit in the anode lead of the 807 and for correct (*i.e.* minimum harmonic output) adjustment of the power amplifier tank circuit

giving excellent output on the fundamental or harmonic (up to the 4th) frequency of the crystal used. Once the wide-band anode circuit has been tuned to the middle of the band, any one of four available crystals may be used without further adjustment.

As shown, 3.5 Mc/s. crystals are used and the coil (Lw) is adjusted (to give optimum crystal performance for C.W. keying in the crystal oscillator valve screen grid circuit) while using a crystal of about mid-band frequency.

Supply voltages for the oscillator are connected via the 4-way *Jones* plug-and-socket clearly visible in Fig. 3. The output lead is plugged into a socket which is mounted on the main chassis to the right-hand rear of the milliammeter, and which is connected to the V.F.O.-crystal selector switch, SW4 (Fig. 1).

If desired, a suitable V.F.O. unit could be mounted in place of the auxiliary crystal unit.

Mechanical Details

Fig. 2 shows the disposition of all controls. The first toggle switch, lower left, is the V.F.O.-crystal

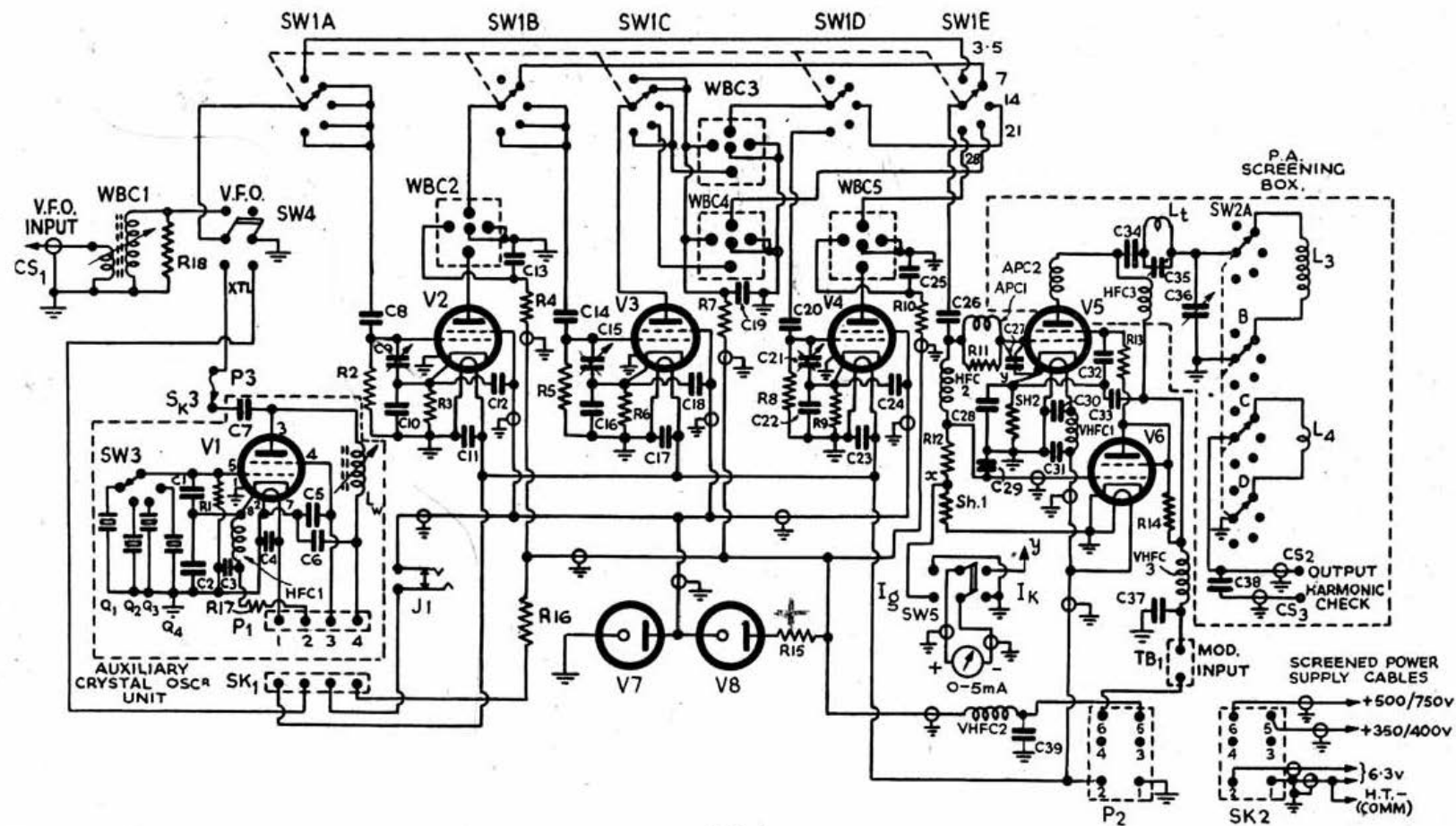


FIG. 1
CIRCUIT DIAGRAM OF THE TVI-PROOF 50-WATT TRANSMITTER

selector switch and is arranged to be "up" for crystal operation and "down" for external V.F.O. operation. The five-position switch, lower centre, is SW1A to E (Fig. 1) which selects the appropriate driving frequency for the power amplifier. The second toggle switch, lower right, is the meter switch and is arranged so that the meter reads the 807 grid current when "up" and the cathode current when "down." The crystal selector switch may be seen, upper left, next to the 0.5 mA. meter which has a 0-250 mA. calibration scale added to the original range for use in conjunction with the shunt, Sh2, in the 807 cathode circuit.

The actual value of Sh2 will depend upon the internal resistance of the milliammeter. The centre knob and dial controls the P.A. tank condenser. Immediately above this is the harmonic trap circuit tuning condenser control. To the right of the main dial is the P.A. coil turret switch and the harmonic check point coaxial socket.

The transmitter is constructed on a standard size 18 S.W.G. brass chassis, 17in. by 10in. by 3in. deep. The front panel, which is of 14 S.W.G. mild steel, finished black crackle, measures 19in. by 10½in. The 807 stage screening box, made of 20 S.W.G. brass sheet, measures 9½in. by 6½in. by

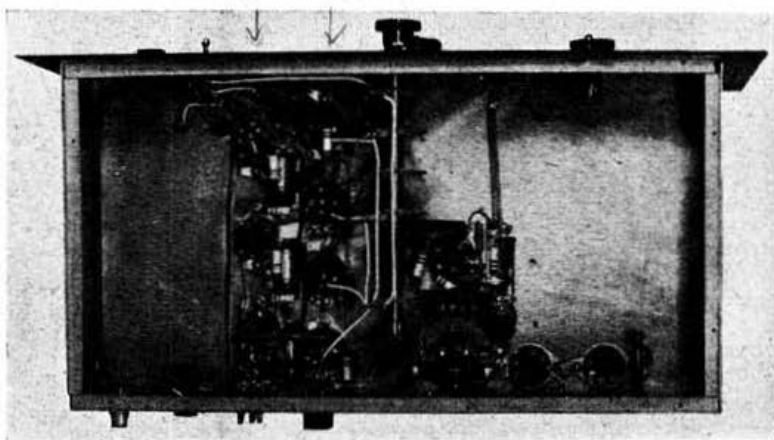


Fig. 4
Underside view of chassis. Note:—Screened wiring and careful placing of components to achieve effective V.H.F. decoupling.

COMPONENTS LIST—TVI-PROOF 50-WATT TRANSMITTER

CONDENSERS

- C1. 47µF. Erite Ceramicon N750L.
- C2, 7, 26. 100µF. Erite Ceramicon N750L.
- C3, 4, 5, 6. .01µF. Tubular paper 350V. working.
- C8, 14, 20. 100µF. midget mica.
- C9, 15, 21. 3/30µF. Mullard concentric air trimmers.
- C10, 16, 22. .01µF. Dubilier type 690 mica.
- C11, 17, 23. .01µF. Dubilier micro-pack paper.
- C12, 13, 18, 19, 24, 25, 30, 31, 32, 39. .001µF. T.C.C. type CM20 mica.
- C27. 10µF. Erite Ceramicon N750L.
- C28. .01µF. T.C.C. mica type 670.
- C29. .002µF. T.C.C. mica type 670.
- C33, 34, 37. .001µF. T.C.C. type M.
- C35. 5/100µF. Polar midget air trimmer.
- C36. 150µF. (max.) air spaced condenser.
- C38. 5µF. Erite Ceramicon N750L.

RESISTORS

- R1. 47,000 ohms Erite ½-watt.
- R2, 5, 8. 22,000 ohms ½-watt.
- R3, 6, 9. 470 ohms ½-watt.
- R4, 7, 10, 11, 13, 16. 100 ohms Erite ½-watt.
- R12. 22,000 ohms Erite ½-watt.
- R14. 22,000 ohms Welwyn 20-watt wirewound (nominal value).
- R15. 6,000 ohms Welwyn 10-watt wirewound.
- R17. 330 ohms Erite ½-watt.
- R18. 10,000 ohms Erite ½-watt.
- Sh1. 100 ohms Erite ½-watt.
- Sh2. Approx. 5 turns 36 S.W.G. copper wirewound on 100 ohms Erite ½-watt resistor (to shunt 0.5 mA. to read 250 mA. F.S.D.).

VALVES

- V1. 2, 3, 4, 6. 6V6 metal.
- V5. 807.
- V7. VR 150/30.
- V8. VR 150/30 (if desired).

INDUCTANCES

- WBC1. 80 ohm line-to-grid transformer. Standard Ekco former ½ in. O.D. wound full (single layer close) 38 D.W.S. copper wire. Winding length ½ in. 4 turn link coil wound over cold end 24 S.W.G. P.V.C.
- Slug fully in—tunes 3.5 Mc/s. with 20µF. strays and valve input capacity.
- WBC2. Labgear 7 Mc/s. wideband coupler.
- WBC3. Labgear 14 Mc/s. wideband coupler.
- WBC4. Labgear 21 Mc/s. wideband coupler.
- WBC5. Labgear 28 Mc/s. wideband coupler.
- Lt. Harmonic trap coil 6 turns 18 S.W.G. ½ in. dia. winding length ½ in.
- Lw. Ekco ½ in. dia. former with slug. Winding ½ in. close wound 38 D.W.S. copper.
- L1 to L10 inclusive. Labgear 35-watt coil turret, or home-built to following specification (enamelled copper wire throughout):
- L1. 3.5 Mc/s. 40 turns 16 S.W.G. close wound on 1½ in. dia. former.
- L2. 3.5 Mc/s. 4 turns 18 S.W.G. P.V.C. link coil.
- L3. 7 Mc/s. 30 turns 14 S.W.G. close wound self supporting. Winding length 2½ in.
- L4. 7 Mc/s. 4 turns 18 S.W.G. P.V.C. link coil.
- L5. 14 Mc/s. 10 turns 14 S.W.G. close wound self supporting. Winding length 1 in.
- L6. 14 Mc/s. 3 turns 18 S.W.G. P.V.C. link coil.
- L7. 21 Mc/s. 6 turns 14 S.W.G. self supporting. Spaced to winding length 2 in.
- L8. 21 Mc/s. 2 turns 18 S.W.G. P.V.C. link coil.

- L9. 28 Mc/s. 4 turns 14 S.W.G. self supporting. Spaced to winding length 1 in.
- L10. 28 Mc/s. 2 turns 18 S.W.G. P.V.C. link coil.
- HFC1, HFC2. Eddystone H.F. choke coil. Cat. No. 1010. 1.25 mH.
- HFC3. Eddystone H.F. choke coil. Cat. No. 1022. 1.5 mH.
- VHFC1. Heater choke. 34 turns 16 S.W.G. close wound on ½ in. dia. former.
- VHFC2 and 3. 30 S.W.G. close wound on ½ in. dia. former. Winding length 1½ in.

SWITCHES AND SOCKETS

- SW1 A to E. Oak switch, 5 wafer, 5-way. (Wafers spaced to suit circuit layout.)
- SW2 A to D. Power amplifier coil turret switch.
- SW3. Oak switch, 1 wafer, 4-way.
- SW4. Bulgin toggle switch D.P.D.T.
- SW5. Bulgin toggle switch D.P.D.T.
- CS1, 2, 3. Belling-Lee coax. sockets type L604/S.
- SK1. Pa'nton "Jones" socket, 4-way.
- P1. Pa'nton "Jones" plug, 4-way.
- SK2. Pa'nton "Jones" socket, 6-way.
- P2. Pa'nton "Jones" plug, 6-way (chassis mounting).
- SK3. Insulated wander plug socket.
- P3. Wander plug.
- TB1. Terminal block 2-way.

MISCELLANEOUS

- Midget stand-off insulator. Eddystone Cat. No. 1019 (support for hot end of HFC3).
- APC1. 30 S.W.G. enam. close wound fully occupying Erite ½-watt resistor (R11).
- APC2. 15 turns 30 S.W.G. enam. close wound on ½ in. dia. Tufnol rod former.
- Milliammeter. 0.5 mA. D.C. moving coil.

5½ in. and is furnished with a well-fitting flanged lid.

The layout of the main components is shown in Fig. 3, a plan view of the top of the transmitter. V6, the clamper valve, may be seen to the rear of the 807 and outside the screening box. Fig. 4, an underside view of the chassis with the bottom screening plate removed, gives a good idea of the general wiring and disposition of the smaller components. The extra trimmer condensers, C9, C15 and C21, which were later fitted to compensate for the 10 μ F. grid-to-cathode harmonic shunt condenser, C27, are not shown. The harmonic filter chokes, VHFC2 and VHFC3, may be seen in the H.T. leads running to the Jones type supply plug mounted on the rear of the chassis. The wide band input transformer, used to couple the 80-ohm output of the 3.5 Mc/s. V.F.O. to the grid of V2 or V5, is to the right of the toggle switch which controls the meter. The grouping of all by-pass condensers and other small components around each valve and the positioning of the screened wiring should be noted.

The rear view, Fig. 5, shows the coaxial output socket (top left of the 807-stage screening box) and, in a row from left to right at the rear of the chassis: the terminal block to facilitate connection between the transmitter and the secondary



Fig. 5

Rear view showing method of picking up supply voltages for auxiliary crystal drive unit. This unit can be omitted altogether without impairing either the appearance or electrical efficiency of the main unit.

of the modulator output transformer when using anode and screen modulation of the 807 power amplifier; the 12-way Jones power supply plug; the auxiliary crystal oscillator keying-jack socket; and the V.F.O. coaxial input socket. The 12-way supply plug is not strictly essential and a 6-way type is actually shown in Fig. 1. In fact, if desired, the power plug and socket may be dispensed with altogether and the cables run out of the chassis through a rubber grommet. These leads would then be terminated in a suitable plug at the point of connection to the power supply unit. The present arrangement was used for added convenience and to fit the station layout at G5RV.

Adjustment and Performance

After a careful check of all wiring, the heater voltage should be applied and the 350 volt drive H.T. switched on. If the auxiliary crystal oscillator has been constructed it should not be plugged into its supply socket at this stage. With a suitable milliammeter (0-100 mA.) applied in turn

across the resistors R4, R7 and R10 the standing feed to V2, V3 and V4 may be checked. This should be about 18 mA. in each case. The V.F.O. output should be set at 3,550 kc/s. and plugged into the coaxial socket provided. With the range-switches in the 3.5 Mc/s. position (*i.e.* fully anti-clockwise) and the 807 meter switch in the grid current position, the wide band input transformer, W.B.C.1, should be adjusted by means of its dust iron slug until maximum grid current is obtained in the 807. This should be set between 2 and 3 milliamperes. If the V.F.O. output power is variable, for example, by means of a screen grid potentiometer in its output stage, the 807 grid current may be set very conveniently to the correct value. Alternatively, the link coil coupling in the V.F.O. should be varied to produce the desired result.

Next, turn the range-switches to position 2 (7 Mc/s.) and adjust the 7 Mc/s. wide band coupler, W.B.C.2, trimmer condensers for maximum 807 grid current, which should again be set between 2 and 3 mA. by re-adjustment, if necessary, of the V.F.O. output level. The compensating condenser, C9, across the grid of V2 to earth, should also be adjusted for maximum 807 grid current.

The 14 Mc/s. range should now be selected and the 14 Mc/s. wide band coupler, W.B.C.3, adjusted in the same manner. The condenser, C15, must also be adjusted to produce maximum 807 grid current, to compensate for the removal of the 807 input capacity (including the 10 μ F. anti-parasitic condenser, C27) from the output winding of W.B.C.2. The extra trimmer, or compensating, condensers, C9, C15 and C21, should be left at minimum capacity until adjustment of them is commenced.

The range switches should next be set to the 21 Mc/s. position and W.B.C.4 adjusted. Finally, with the range switch set to 28 Mc/s., W.B.C.5 may be trimmed and C21 adjusted for maximum 807 grid current. A maximum of between 1½ and 2 mA. grid current may be obtained on 21 and 28 Mc/s. but this drive will be found adequate for efficient operation of the 807. In fact, the grid current may very well be set to 2 mA. on the lower frequency bands also.†

A refinement in setting up the wide band couplers is to proceed in the following manner: Set the V.F.O. frequency so as to give output from the transmitter some 50 kc/s. from the low frequency edge of the band concerned and re-trim the grid windings of the W.B.C.'s in use for maximum 807 grid current. Then, set the V.F.O. for output about 50 kc/s. from the high frequency edge of the band and re-trim the anode winding condensers of the W.B.C.'s in use. In this way, the transmitter frequency may be varied over the whole of any band selected with minor re-adjustment of the 807 tank and the aerial tuning unit condenser.

At this stage the auxiliary crystal oscillator, if constructed, may be tested. The 4-way Jones power plug should be inserted in its socket and, with an appropriate crystal selected and the V.F.O.-crystal toggle switch "up" in the crystal position, the range switches should be set for 3.5 Mc/s. With a key plugged into the appropriate jack socket and depressed, the crystal oscillator

† Careful tests have shown that the 10 μ F. harmonic shunt (or parasitic suppressor) condenser, C27, is apparently not essential and since its inclusion, together with the compensating condensers, C9, C15 and C21, may require the pre-set coil slugs in the Labgear Wide Band Couplers to be re-adjusted, the reader may prefer to omit these condensers at least until preliminary TVI tests have been conducted. Then, if their use seems indicated, they may easily be added and the W.B.C. coil slugs adjusted suitably.

anode coil, Lw. should be adjusted by means of its slug to give sufficient 807 grid current and, at the same time, to give clean keying. Provided that reasonably active crystals are employed (1.7 or 3.5 Mc/s. fundamental) there should be no difficulty in obtaining clean keying at all normal hand speeds. Once adjusted for a crystal whose harmonics fall approximately in the centre of the 14 to 28 Mc/s. bands, no further adjustment of Lw should be necessary. The crystal oscillator valve (V1) anode current should be checked by connecting the test milliammeter across R16. The current should be about 15 to 20 mA. Since the V.F.O.-crystal selector switch breaks the crystal oscillator cathode circuit when in the V.F.O. position, it may conveniently be used as the "stand-by" switch when using crystal control.

Checking the P.A.

With the 350 volt H.T. switched off, the 500 volt supply to the 807 power amplifier may be applied and the screen voltage dropping resistor, R14, and associated clamper valve, V6, checked for correct 807 screen voltage. The 807 must also be checked for any signs of parasitic oscillation. First, measure the 807 screen volts and check the cathode current by depressing the meter switch. With the value of R14 shown in Fig. 1 the standing voltage on the screen of the 807 should be about 80 to 100 and the cathode current about 50 mA. Some adjustment of R14 may be required later, in order to obtain the required 300 volts, when the screen voltage is measured under normal driving conditions with the 807 fully loaded; but a value of 20,000 ohms will be approximately correct. Next, with the meter switch in the 807 grid current position (*i.e.* up) the range switches should be set to each band in turn and the 807 tank condenser slowly rotated while watching for any sign of grid current. If all is well, and it should be if the layout used is approximately similar to that shown, there will be no sign of oscillation in the power amplifier stage. The 350 volt drive H.T. may now be applied and the power amplifier adjusted and loaded, using a dummy load lamp, on each band. At this point the 807 screen volts should again be checked, this time while the stage is being normally driven and loaded. Table I gives typical voltage and current readings for the transmitter under normal C.W. working conditions at approximately 50 watts input to the 807.

If desired, a maximum C.W. input of 75 watts may be used to the power amplifier by providing a power supply of 650 to 750 volts. In this case, provision must be made for increasing the value of R14 suitably. An extra resistor, wired in series with R14, could be provided with a shorting switch to bring it into circuit as desired.* Alternatively, such an arrangement could be used with the normal power amplifier H.T. voltage of 500 to provide a very convenient method of reducing power for tuning up, or to limit power to the 807 when it is used to drive a 150-watt amplifier. A value of about 10,000 ohms is recommended.

With the transmitter adjusted and working satisfactorily on each band, it should be loaded into the aerial system. This should include a suitable low-pass filter in the coaxial cable from the transmitter to the aerial tuning unit. Under these conditions the residual harmonic output appearing across the transmitter output link coil should be checked. Using a harmonic monitor^(†), loosely coupled with a single turn link coil connected to

a short length of 80-ohm coax. cable (PT1M), the other end of which terminates in a coaxial plug inserted in the "harmonic check" coaxial output socket on the front panel, the transmitter should be set up on 14,200 kc/s. and the harmonic monitor tuned to the 42.6 Mc/s. third harmonic for the Alexandra Palace area or to the 56.8 Mc/s. fourth harmonic in the case of Sutton Coldfield. The harmonic trap circuit condenser should now be rotated until the minimum third, or fourth, harmonic is observed on the monitor microammeter. The power amplifier tank circuit is also re-adjusted to obtain minimum harmonic output. The setting of the tank condenser for minimum harmonic should lie close to that for maximum fundamental output and the rise of 807 cathode current above minimum possible (with amplifier loaded) should not exceed 5 per cent. If desired, the integral series trap circuit described in the March, 1950, issue of the BULLETIN⁽⁴⁾ may be employed and its coil adjusted by opening out or squeezing its turns together until minimum harmonic is observed.

It may be found advantageous to bend over one corner of one of the end rotor plates of the harmonic trap condenser, C35, so that, in the "fully in" position, the trap circuit is short circuited. Then, when operating on 28 Mc/s., where the trap will be redundant, it may thus effectively be removed from the 807 anode circuit with a consequent slight increase in efficiency. However, the P.A. efficiency is *not* affected by the use of the trap circuit on all other bands.

Use of Low Pass Filter

This transmitter is specifically intended to be used with a low pass (harmonic) filter which must be connected in the 80 ohm coax. feeder from the transmitter to the aerial tuning unit. It is recommended that an aerial tuning unit be employed even if 80 ohm twin or coax. feeder is already used for the aerial.[†] The filter should be inserted as near to the transmitter output as possible with not more than two or three feet of coax. between it and the transmitter. The coax. line from the L.P. filter to the aerial tuning unit may be of any convenient length. The filter recommended is that already described⁽³⁾. In difficult cases (*i.e.* "fringe" areas) it may be necessary to use *two* such filters connected in series. The loss introduced at the fundamental frequency (from 3.5 to 30 Mc/s.) will be negligible—about $\frac{1}{2}$ db. for two filters in series. When using L.P. filters in this way, it may be found necessary to tighten the link coupling from the coax. feeder to the aerial tuning unit as compared with the degree of coupling used when no filter or filters are employed.

Television Interference Tests

Tests for TVI are most conveniently done if a television receiver is available in the same house as the transmitter; the writer has a monitor television receiver (a Pye model LV20) installed at the operating position and often enjoys the television programme whilst actually in QSO! However, if this is not possible the help of a neighbour must be sought.

First, using a dummy lamp load connected directly to the transmitter output coax. socket, tests should be made on each band at normal power (50 watts) on C.W., and 'phone if used. There should be no trace of interference. This is so at G5RV with the transmitter two feet away from the television receiver. If interference exists, inadequate screening or power supply lead filtering is probably the cause.

[†] Except for 28 Mc/s. where 80-ohm coax. feeder is used.

* This extra resistor should be inserted between the lower end of R14 and the anode of the clamper valve so that its control switch is never more than 300 volts above earth.

Next, connect the L.P. filter, aerial tuning unit and aerial and repeat the tests. If any interference is noted, and there may be a trace when operating on 14 Mc/s. in the Alexandra Palace area or on 28 Mc/s. in the Sutton Coldfield area, it may be necessary to employ a second L.P. filter or reduce power to 25 watts* or both. However, on the 3.5 and 7 Mc/s. bands no trouble whatever should be experienced.

Naturally, the exact nature of the results obtained will depend on distance from the tele-

vision log of stations worked while testing may be of interest. On 3.5 Mc/s. the transmitter has been used for regular C.W. contacts with G3ACC and G2SA over a period of three months without a single failure to obtain a "solid" QSO. On 7 Mc/s., several C.W. and 'phone contacts have been obtained. An interesting QSO on this band was with G2DC in Bulford, Salisbury Plain, who said he could clearly hear the television programme in the background during transmissions from G5RV!

TABLE I

Stage	Isg mA		Ik mA		Esg Volts		Ea Volts
	A	B	A	B	A	B	
(V1) C.O.	—	—	15	20	150	150	350
(V2) F.M.1	—	—	18	25	150	150	350
(V3) F.M.2	—	—	18	28	150	150	350
(V4) F.M.3	—	—	18	35	150	150	350
(V5) P.A.	1	10	55	105	95	275	500

Typical voltage and current readings of 50 watt TVI-proof transmitter.

Grid 1. current 2.5 mA. R14, 16,000 ohms. Columns A refer to key-up and columns B to key-down condition.

vision transmitter and proximity of the television receiving and the amateur transmitting aerials. Table II indicates the actual results obtained at G5RV 30 miles from Alexandra Palace using a poor television "H" array (18 feet high) within 50 feet of the transmitting aerial.

The transmitting aerials used at G5RV are:—

- (1). An all-band 102 foot long aerial centre fed with 100-foot open wire feeders.
- (2). A 3 element 28 Mc/s. rotary beam fed with 80-ohm coaxial cable (no aerial tuning unit).

Transmitting Results Obtained

The reader will naturally want to know what he may expect to work with such a transmitter—after recovering from the effects of celebrating his release from the TVI bondage. It will be appreciated that the amount of work involved in designing, building and testing the transmitter described, and subsequently in writing this article, has left the author with very little time for DX chasing and gardening! However, a brief extract from

The 14 Mc/s. band has yielded good C.W. contacts with VK, ZL, VE6, W1.2.3.6 and 7, CN8, UA9, PY4 and 5, LU, PK 1, VS2 and FM7WF! Thus, W.A.C. has been achieved in very few operating hours—a good share of which has been during television hours. On 28 Mc/s. an excellent 'phone contact was enjoyed with CO7GM while using only 25 watts input and several other DX stations have been worked. Finally, contacts have been conducted on all bands during television hours without complaint from neighbours and with excellent reception on the local television monitoring receiver a couple of feet away.

Conclusion

While it would be foolish to make an unequivocal statement that such a transmitter is 100 per cent. TVI-proof in all cases and under all conditions at the various localities where it may be used, it can be stated that, even in "fringe" areas, it should be capable of permitting TVI-free operation on at least two and possibly three of the five (including 21 Mc/s.) bands available. The probability is that in most cases complete freedom from TVI will be obtained on all bands.

TABLE II

Band (Mc/s.)	System	Harmonic	μA^*	Effect on local T.V. picture
3.5	C.W.	12th	0	Nil
3.5	'phone	12th	0	Nil
7.0	C.W.	6th	2	Nil
7.0	'phone	6th	2	Nil
14.0	C.W.	3rd	4	Nil
14.0	'phone	3rd	4	Negligible†
21.0	C.W.	2nd	1	Negligible†
21.0	'phone	2nd	1	Slight†
28.0	C.W.	2nd	—	Nil
28.0	'phone	2nd	—	Nil

Typical TVI suppression results obtained at G5RV with TVI-proof transmitter.

*As measured by Harmonic Monitor microammeter (loosely coupled to harmonic check point).

†With careful adjustment of all harmonic suppression devices and frequent monitoring, slight modulation bar effect visible on heavy modulation peaks only. Television monitor receiver two feet from transmitter.

It is, however, still amazingly difficult to convince the average television viewer that there are other forms of possible interference to television besides amateur transmitters *once he knows that you have a transmitter!* For a long time a log has been kept of various forms of interference seen on the television screen whether transmitting or not. Such a log can be extremely useful! It might even be worth keeping a log of the times when you are off the premises, to confound the unbelievers!

The design is presented herewith as a serious effort in TVI-proof construction and as an indication of the basic requirements of future amateur transmitter technique. The writer will be pleased to hear from readers who construct this transmitter and to learn of the results obtained by them.

It is hoped to describe the design of a TVI-proof 150-watt power amplifier, for use with the present transmitter as the exciter unit, in a future issue of the BULLETIN.

this band the interference was considerably less severe (but objectionable), even under this condition.

Although telephony was not used during these tests, the writer has indicated, in Table III, where it could be used without interference resulting.

Liverpool Tests

Further "fringe area" tests have recently been conducted with this transmitter at Liverpool.

The transmitter was set up in a room adjoining one in which a standard superheterodyne TV receiver was being used to receive the Sutton Coldfield transmissions. The measured TV signal level at the aerial terminals of the receiver was of the order of only 70 μ V! Under these conditions, and with the transmitting aerial some 40 feet from the TV aerial, absolutely *no trace* of interference was observed while transmitting on 3.5, 7, 14 and 28 Mc/s. with 50 watts input C.W.

TABLE III

Band (Mc/s.)	Input (Watts)	System	Transmitter Aerial	L.P.F.	Effect on T.V. picture
3.5	50	C.W. ^(p)	A*	1 or 2	Nil
7.0	50	C.W. ^(p)	A	2	Nil
14.0	50	C.W.	B†	2	Cross hatching, increase of brilliance and occasional frame sync. slip.
28.0	30	C.W. ^(p)	B	2	Nil

*7 Mc/s. dipole fed with 80 ohm twin feeder.

†14 Mc/s. dipole fed with 80 ohm twin feeder.

(p) 'Phone operation possible.

APPENDIX

The transmitter described in the present article was successfully demonstrated in a "fringe" area during the course of a lecture given by G5RV on May 26 to the Cambridge and District Amateur Radio Club. The transmitter was set up in a room kindly loaned by Messrs. Pye Ltd., who also supplied a standard table model television receiver for the tests, in their works at Cambridge. The television aerial was about 30 feet high and slightly screened from Alexandra Palace by the factory buildings. The transmitting aerial was located some 75 feet away. The television receiver was about 15 feet away from the transmitter.

The results of the tests are shown in Table III. From these results, it may be said that operation in the Cambridge area with complete freedom from TVI should be possible with similarly constructed transmitters in the 3.5, 7, (21) and 28 Mc/s. bands with input power up to at least 50 watts. On 14 Mc/s. it is evident that some 10 to 20 db. of additional harmonic suppression will be required and it is hoped to indicate later methods by which this could be achieved. On 14 Mc/s. working into an aerial tuning unit with *unscreened* coil no trace of interference was observed. This indicates that the transmitter screening is adequate for the reduction of any *directly radiated* harmonic component to negligible proportions.

The removal of the low pass filters, used in the coaxial cable between transmitter and the aerial tuning unit, and detuning the 807 anode harmonic trap circuit, resulted in severe interference to the television picture in all cases except 3.5 Mc/s. On

These results would appear to bear out the earlier forecast ⁽¹⁾ that the TV channel 1 (as used at Alexandra Palace) presents the most difficult case, and that amateurs living in the areas to be served by other channels can take heart.

Bibliography and appended notes.

- (1) ⁽³⁾ ⁽⁴⁾ ⁽⁵⁾ "Further Improvements in TVI Suppression," by LOUIS VARNEY, A.M.I.E.E. (G5RV), R.S.G.B. BULLETIN, May, 1949.
- "Television Interference Suppression" (by the same author), R.S.G.B. BULLETIN, March, 1950.
- (2) At G6LB, G2AJF and G3FNN (Billericay).

London Members' Luncheon Club

LONDON Members at their monthly luncheon club meeting held on June 16 at the Kingsley Hotel, Bloomsbury Way, W.C.1, extended a warm welcome to a number of visitors from abroad including Commander "Bill" Smith, U.S.N., W3AN, Commander "Nat" Atwood, U.S.N., W3KTR, "Dave" Buckley, W2QUJ, Harry Gil, LU9AD/LU3DJS, W. Holloway, ZS6DF and Wing Commander Stan Conway, ex VS6AQ.

During the luncheon Mr. Gil handed to the Chairman, John Clarricoats, G6CL — acting as deputy for Ken Alford, G2DX — a pennant of the Argentine Radio Society, and in return received from Stanley Lewer, G6LJ, Past President, the official pennant of the R.S.G.B.

BULLETIN STORY

By B. W. F. Mainprise, B.Sc. (Eng.), A.M.I.E.E., (GSM^D)*

A 25th Anniversary review of the progress of amateur equipment and operating technique, as recorded in the pages of the BULLETIN since its inception in July, 1925.

ADVANCES in the design of radio equipment are recorded from time to time in the journals of the various professional institutions and similar organisations. But clues to technical successes and difficulties, to propagation conditions, and to general operation on the short waves in the early days of development, clues which demonstrate to posterity the way in which the popularity of numerous British techniques rose or fell as wavelengths were shortened, may be found in much richer profusion in the pages of the BULLETIN than in the more formal material of many professional publications.

Let us then take down from the shelves the early volumes of the T. & R. BULLETIN (the name was changed to the R.S.G.B. BULLETIN in July, 1942) and work our way through their pages to the present time.

Early Transmitters

Volume 1, No. 1 was born in July, 1925. In page size and in format there is a distinct family resemblance to issues 300 or so ahead. In that issue we find Ralph Royle—G2WJ and still active—describing the first transmitter to appear in its pages.

As was the practice in the mid-1920s the components are mounted on a wooden baseboard. To the rear is the valve in its wooden supporting frame, and adjoining it the H.T. blocking condenser, home-made of zinc plates separated by glass $\frac{1}{4}$ -plates obtained from a photographic store. To the right of the baseboard is the aerial coil with its tuning condenser, and the transmitter plate coil adjoining the aerial circuit. Towards the front are the grid tuning condenser and coil, grid leak

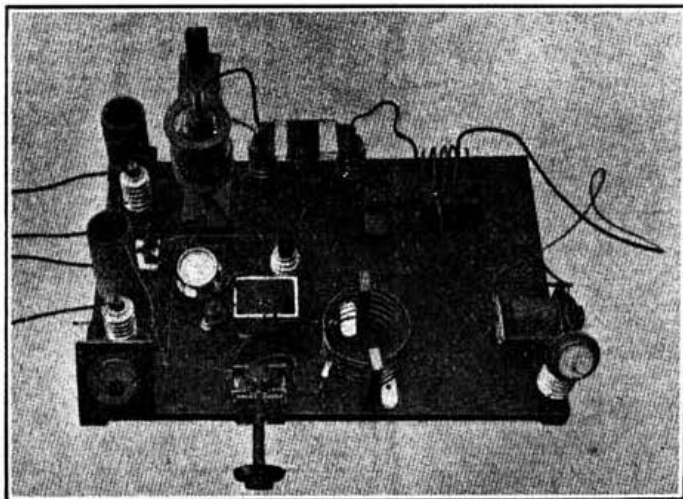
and condenser. On the left are two R.F. chokes and the power supply connections. Power supply in this case was from domestic mains, with chemical rectification smoothed by conventional choke and condenser.

Plain oscillators such as this were the order of the day, but simple equipment did not result in any lack of long distance working. No surprise is expressed at the appearance in the DX lists of that year of plentiful stations not only in countries such as the United States, Australia, New Zealand and Canada, but also in Brazil, Argentina, Porto Rico, Mexico, Russia, Chile, Morocco (though South Africa does not appear till later), Palestine, Mesopotamia, the Philippines and other places which the average amateur would still consider to be creditable contacts. Many of the countries listed, we note, are those possessing terminal ports for shipping, where marine communications on long and medium wavelengths doubtless provide a source of operators and maintenance engineers, interested in the subject and having access to component parts.

At first reading we may come to grief here and there over the prefixes—or “intermediates”—of those days, but they are mostly self-explanatory. A for Australia, Z for New Zealand, C for Canada, CH for Chile, U for the United States, BZ for Brazil, and so on. Belgians are still using delightfully short call signs such as T2 and P7. The first truly international prefix list was introduced towards the end of 1928.

Our present bands of 3.5, 7, 14 and 28 Mc/s. are less rigidly defined. The so called “top” band extends from 150 to 200 metres and some of the older stations are still permitted to use 440 metres. Permits for trans-Atlantic working are issued for work around 100 metres.

* 48 Earlsfield Road, Hythe, Kent.



Ralph Royle, 2WJ, was the first to describe a transmitter in the "Bulletin." For operation on 23 metres the Aerial Tuning Inductance (A.T.I.) consisted of 3 turns of No. 14 S.W.G., 5in. diameter. The plate coil had 8 turns of No. 16 S.W.G., and the grid coil 2 turns of a coil consisting of 6 turns of No. 14 S.W.G.

Early Receiver Problems

The short wavebands, 23 and 45 metres, provide by far the most interest and occupancy, the latter enjoying the greatest popularity. The 23 metre band was still a little tricky for some, as we find the late E. J. Simmonds 20D—one of the leading British amateurs of his time—starting an article with the words, "I daily receive letters asking for particulars of a simple circuit capable of efficient reception on 23 metres." He proceeds to describe a straightforward detector circuit with reaction controlled by variable condenser between coil and earth—a circuit which after 25 years would still be considered one of the most suitable for a simple receiver.

Another contributor correctly advocates stripping plates from a tuning condenser and increasing the number of turns on a coil for improved signal strength. In fact, in these early issues of the BULLETIN one constantly comes across suggestions which time has fully confirmed in theory and practice. Though so great a proportion of contributors to these pages are neither professionally trained nor engaged in communications, it is difficult off-hand to point out any instance of a fallacious line of thought being engendered by the BULLETIN; slips there may be here and there, but little which, after the passage of years, can be held as disproved.

Telephony

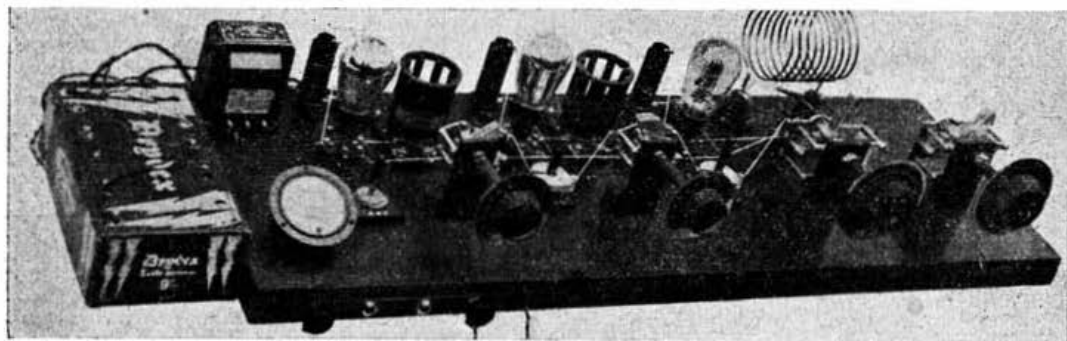
By 1925 telephony was well established. Grid modulation was popular on account of the low gain and simplicity of the audio circuit required.

mitting valves, suppressor grid modulation was finding a certain amount of popularity, as the correct conditions of drive, bias and loading were more clearly defined than was the case with the older control-grid modulation.

Since the war, telephony operators have again been responsible for a number of important transmitter developments. This time progress lay in narrow band frequency modulation, and in side-band limiting and suppression. How fast these trends may displace the Class C amplifier, amplitude modulated at high level and radiating both sidebands, remains to be seen.

Development of 28 Mc/s.

Among many achievements recorded in the BULLETIN pages, those relating to the development of the 28 Mc/s. band are worthy of note. By 1928, with the sun-spot cycle already well past its peak, a number of British amateurs were turning their attention to this band. August and September saw American signals penetrating into Europe and gave France the first trans-Atlantic contact. In Britain J. W. Mathews G6LL described his five-stage crystal controlled transmitter. The oscillator and two successive doublers followed what later proved to be standard practice as regards circuits, and were mounted on a wooden rack. Adjoining this was a perforated zinc screening box containing the third doubler and the grid circuit of the final stage. Mention was made of the R.F. stress set up across the glass pinch of single ended valves at this frequency, so a double-ended SW.D.E.T.1 was



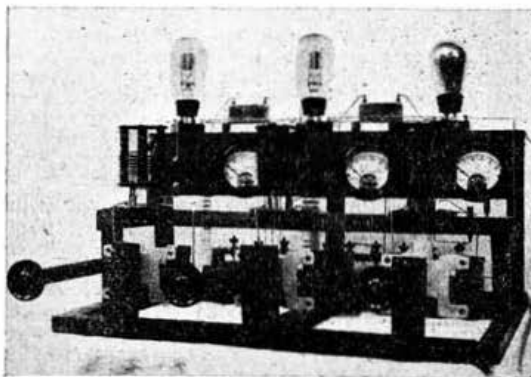
An effective breadboard type crystal controlled transmitter. Built about 1929.

Systems in which the microphone was placed in the earth lead or in a circuit coupled to the aerial so as to modulate the output by the varying resistance of the microphone were rapidly dying out. Choke control was—and still is—the system *de luxe*, but in those days only Class A operation of the modulator stage was possible, partly because of the considerable voltage required to bias the valves to cut-off. This rendered anode modulation of any but low power transmitters an expensive matter, for considering an output stage running at only 50 watts, the Class A modulator stage would have to run at an input of around 100 watts and would perform quite a formidable affair.

Around the middle thirties valves were being developed with sharper characteristics—owing to the intrusion of tetrodes and pentodes into the audio frequency stages—and Class B operation with its vastly increased output became possible. Anode modulation of R.F. stages running at 50 watts or more thus became quite practicable and at this period we may say that telephony operators were providing the chief advance in transmitter design. Also, with the arrival of pentode trans-

chosen for the final valve. This was horizontally mounted, with its tank and aerial coils on a skeleton wooden frame.

On October 21, 1928—a few days after it had



The 10-metre transmitter used by G6LL to make his pioneer DX contacts with the U.S.A.

been described in the BULLETIN this transmitter gave G6LL the first British trans-Atlantic contact, using an input of 50 watts. Within a week Rodman G2FN had contacted California (W6UF), with only 8 watts to a T.P.T.G. oscillator. Both British operators were using half-wave vertical Zeppelin aerials and two-valve receivers.

Contact Bureau (q.v.) had been organised for nearly a year and was proving invaluable at this time of unsuitable components and insulation. How difficult things were can perhaps be understood from the Manager himself (T. Palmer Allen G16YW) writing, "I tried for hours to make a very good maker's valve oscillate at this frequency." It is undoubtedly true to say that many British amateurs owed their successes on this band to the keen experimental work and regular reporting by the group members of the Bureau.

Variable Frequency Oscillators

After the middle thirties wavebands were becoming increasingly crowded. Here in Britain, for instance, the issue of call-signs had been limited to the series G2, 5 and 6, but now a series of G8 calls was introduced, soon to be followed by the G3 and G4 calls. With the arrival of these new calls we observe the passing—except for a few



An early communications type receiver employing screen grid valves. Circa 1928.

exceptions—of what had been a very pleasant custom for the past dozen years or so. This had been for the licensing authorities to allot to a lucky proportion of operators, call-signs bearing a definite relationship to the owner's names or initials. Thus, W. Scarr G2WS; Milne, G2MI; V. M. Desmond, G5VM; Clarricoats, G6CL, and many similar examples. How the fortunate were chosen the writer has never known but he has long been grateful for being included among them.

This crowding of wavebands resulted in operators no longer being able to tune right across a band when searching for replies. The range of frequencies covered became increasingly restricted to around the frequency on which the call had been made, for it was here that the aerial system would be resonant and provide optimum signal strength. Therefore, to contact a given station it became more and more necessary to reply close to its frequency. Crystals were too expensive to install at intervals of every few kilocycles, so a return was made to the tunable oscillator.

Such oscillators had of course been used in the past, but mainly for marine and Service transmitters, where the bands required might not be in harmonic relationship. They were termed Master Oscillators and in general were intended for setting to a given frequency for a considerable period of operating and not for rapid manoeuvring at frequent intervals as they did not incorporate band-spreading. The term Master Oscillator was accordingly considered by amateurs to imply too limited mobility and instead the more clumsy term Vari-

able Frequency Oscillator became universally adopted.

These oscillators increasingly displaced crystal stages—though often with an unwelcome fall in quality of tone—through sheer necessity of frequent moves to the frequencies of calling stations. Fortunately, however, they put an end to a rather pernicious practice which had tended to arise, namely that of crowding at the extreme edges of certain bands. Some of the rarer DX stations had settled around 14,399 and 27,999 kc/s, and invariably found a sufficiency of replies within a few kilocycles of such frequencies, with the result that stations working more in the middle of a particular band failed time and again to make contact. With the arrival of the V.F.O., however, and the consequent ability to move to any desired spot in the bands, the piling-up of stations at the band edges, which had given rise to such adverse comment, rapidly died out, though it is still to be found to a lesser extent especially on the 3.5 and 28 Mc/s. bands.

Early Power Supplies

The higher-powered fraternity of the early days often favoured generator sets for H.T. supply, and a full-page advertisement, complete with illustrations and testimonials from leading operators appears in the first issue. They had the advantage of supplying direct current and so avoiding the necessity for step-up transformers, rectification and smoothing. Also it must be remembered that domestic electrification in those days was less widespread than it is now, and that in some towns D.C. mains covered large sectors. Although generator sets were expensive, various ex-R.A.F. machines were available at reasonable prices.

Where a motor generator set was not practicable through expense or lack of driving power, hand generators were used by some stations. The technique of turning the handle at a reasonably constant speed with one hand while keying with the other was no mean achievement, and resulted in good-natured banter from colleagues in "the know."

In stations where an A.C. mains supply was available, diode valves provided the cleanest and most efficient rectifiers; but as all valves were expensive, some stations were still using chemical rectification, consisting of jars of electrolyte holding strips of suitable metals. These rectifiers, somewhat resembling primary cells, presented a low resistance to current in one direction and a higher resistance to reverse flow, but they were messy, often requiring attention and renewal at inconvenient intervals.

In remote country districts many stations had to rely entirely on batteries, in which case the input was generally limited to about 5 watts. This was not, however, too great a disadvantage in an age of single valve transmitters; for with the bands comparatively sparsely occupied even a weak signal would bring in replies.

Receivers

At the start of the period under review, screen-grid valves were still barely developed. Triodes were used in neutralised circuits in quite a number of broadcast receivers, but on the short waves the amplification so obtained was negligible. Therefore, early receivers tended to start off with the detector stage, a practice which was also encouraged by the high cost of valves.

Within the next three years, however, screen-grid valves were increasing in efficiency and popularity, and there was a rush to try them on the short waves. Thus, in March, 1928, we find R. S. Roberts, EG6NR (the letter E indicating that

the station was in Europe) giving a circuit diagram and brief details, but no lay-out of a three-valve receiver, the article being headed *A Short Wave Receiver Employing a Stage of H.F. Amplification*. In July, 1928, the *R.S.G.B. "All Screened" Receiver* is described in detail. Screen-grid valves horizontally mounted were used for the two R.F. amplifiers, with triodes for the remaining three stages. Five rheostats were mounted on the panel and basket wound plug-in coils were specified.

A feature of receivers of this period was their extreme length. In this receiver it was 28 in., and the following year, when the *R.S.G.B. Short Wave Four* was described, it was 24 in., an interesting comparison with the 15 in. or 19 in. of the modern 10-valve communications receiver with internal power pack. The 1931 *R.S.G.B. Short Wave Three* was very similar in lay-out and the length was still around 20 in.

Valve numbers decreased as efficiency improved and operators gained experience. This tendency was to continue unchecked almost till the mid-1930s, for operators found that as the number of valves was reduced the background noise fell off more rapidly than the signal strength. Many first-rate stations built themselves "straight" two-valve receivers, as is seen from the contest reports of that period. Some even went so far as to eschew

post-detector amplification entirely and were loud in their praises of the signal-to-noise ratio of their single valve receivers. Correspondingly the size of receivers fell rapidly and a typical example of a neat two-valve set is given in the August, 1935, issue, employing a pentode detector followed by a triode output stage. Resistance coupling is chosen to avoid threshold howl on the verge of oscillation—a bugbear in smooth reaction which had for years troubled many amateurs and was generally considered to be especially prevalent with transformer coupling. The receiver was operated from a separate mains-unit.

The Superheterodyne and the Crystal Filter

It must not be thought that superheterodyne reception was ignored. A series of four detailed and practical articles appeared in 1926 and such receivers were moderately popular with stations which concentrated more on semi-local telephony than on world-wide C.W., but in general the most successful DX operators favoured the "straight" circuit.

Towards the middle thirties, however, the "straight" receiver was to receive a devastating blow from its rival. In this country Robinson had been working on crystal filters to achieve extreme selectivity and there was much discussion as to whether, when the sidebands of a signal had been mutilated by passing through circuits of high selectivity, the upper register could be satisfactorily restored by tone compensation. Sidebands,

one might mention, are dangerous matters to discuss. As with some well-known political or religious views, an unguarded statement will instantly cause an acrid correspondence to flare up!

On the other side of the Atlantic, bands were becoming alarmingly crowded, so Lamb and others correctly anticipated a means of reducing interference by incorporating a crystal filter in amateur band receivers. In this country Gardiner—6GR—was one of the leading R.S.G.B. members to be working on the subject. Crystal filters of necessity entailed fixed tuned circuits, which, in turn, entailed superheterodyne reception, and thus a drift away from the "straight" receiver began. At the same time the increased amount of constructional work involved in multi-valve receivers providing amplification at radio-, intermediate- and low-frequencies heralded the intrusion of the commercially-built receiver into British stations; where such a step would never have been considered only a few years previously.

In many respects, the drop in the home construction of receivers seems a pity, especially when we note the number of newly-licensed stations that come on the air with never an arduously constructed and lovingly adjusted receiver gracing their operating desks. We can, nevertheless, well understand the installation of the commercial article

in these days when few have an over-abundance of leisure to enjoy and limited accommodation facilities render the provision of workshop space so often out of the question.

One exception still remains to this practice and is provided by the U.H.F. operator. Few of the most successful stations on the 2-metre and 70-cm bands are to be found using commercially-built converters ahead of their

main communication receivers, or at least, commercial units which have not undergone considerable experiment and adaptation. Such practice is a continuance of the care and skill exercised, sometimes by the same operators, twenty-five years or more ago.

U.H.F. Development

Now let us trace for a few moments the path of U.H.F. progress as recorded in the pages of the *BULLETIN*. From the earliest days British and American operators had been to the fore in occupying and developing the higher frequency bands—just as these countries had pioneered 28 Mc/s. development, so they attacked 56 Mc/s.

As early as 1925 we find well-known British operators testing on five metres and being reported over distances up to 16 miles. During the next few years *Contact Bureau* reports on 56 Mc/s. work appear regularly, discussing circuits and the means of reducing losses, for at that period dielectrics consisted almost entirely of those used by power engineers, such as ebonite or bakelite or hardwood.

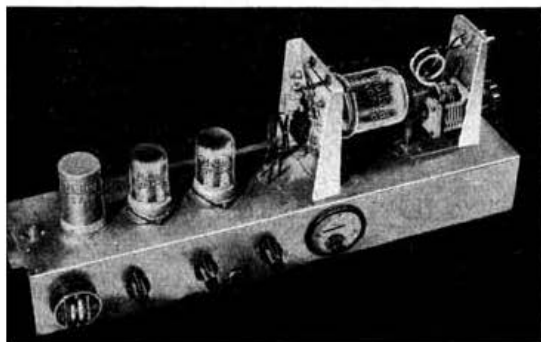


A typical station of the middle thirties—G2DQ in 1934

The widespread use of polystyrene or ceramic insulation was yet to come.

In April, 1926, G2VW wrote on *Some Experiments on 5 Metres*. The transmitter circuit was a series-fed Hartley, the tank coil consisting of a single loop some 8 in. in diameter. Only five components were used—the valve, tank coil (no tuning condenser), grid condenser, choke and grid leak. The single turn coil was of 8 in. diameter, the lower ends being soldered to two plates whose distance apart could be varied by a screw movement to provide tuning. H.T. was fed to the approximate centre of the loop via a sliding contact. The V24 detector valve, an early type of baseless valve of tubular form, was under the tuned circuit and might at first glance be mistaken for a crystal detector. A quenching valve was mounted near the panel, operating on about 20 kc/s. to provide super-regeneration. A loosely coupled wire 2½ metres long was used for aerial.

Transmitters during the next few years were invariably of the self-excited oscillator type, generally employing two valves in push-pull. The tank coil would often consist of a single loop. To broaden the channel and assist reception by super-regenerative receivers, which were chiefly used, the carrier was deeply modulated by tone or voice.



An example of a modern 144 Mc/s transmitter. Three stages multiply the frequency of an 8 Mc/s crystal to drive the horizontally mounted double-tetrode output valve.

Aerials were simple dipoles, generally mounted vertically and fed by a short tuned line, for coaxial or low impedance feeders of solid dielectric were still undeveloped.

Such equipment was suitable only for cross-town contacts as super-regeneration was unsatisfactory for weak carriers. The band accordingly settled down to short-haul working, enlivened from time to time by organised tests from the summit of Snowdon or from the Crystal Palace tower, and these conditions continued till 1935. That year we find a growing dissatisfaction with the lack of development on frequencies of this order. H. C. Page (G6PA) who was then Contact Bureau Manager, wrote an article highly critical in tone, stressing that "Our present-day 56 Mc/s. transmitters are hopelessly unstable and until we can produce really stable transmitters we shall be tied down to the super-regenerative receiver. The use of self-excited transmitters of any kind should be discontinued forthwith."

This criticism resulted in the appearance of the first BULLETIN article to describe a crystal-controlled transmitter for five metres (November, 1935). Starting with a 7 Mc/s. crystal, three stages were used, each doubling the frequency, the final valve being a PV625X running at 300 volts, 30 mA.

The following month a long-lines oscillator driving a push-pull stage was described and the note was reported as having the bell-like tones,

associated with crystal control. Next, in March 1936—incidentally the month in which the first contact took place between Britain and France on five metres—a "straight" receiver was described for C.W. reception, using an XSG R.F. amplifier, a 955 acorn detector valve and a pentode output stage.

Now that the emphasis was on C.W. reception, ranges extended rapidly. Harmonics of Italian and Polish stations were regularly reported when sporadic-E ionisation was present, and the next three summers saw contacts taking place between Britain and other Continental countries. Such contacts would nevertheless seem much fewer than propagation conditions would have permitted, for many of the Continental operators still clung to the older super-regenerative receivers and unstabilised transmitters, often combined in compact transceiver form, as the writer found in 1938 when he took a C.W. receiver to the Rhone Valley and was the only operator to log signals from Britain.

By the time war was approaching, the BULLETIN was reporting contacts on 56 Mc/s. over 150 miles and more through tropospheric propagation and when activity was once more permitted in 1946 such contacts attracted almost as much interest as those of longer range across Europe through sporadic-E ionisation. But the popularity of beam aerials on the DX bands had spread no less to 56 Mc/s. and had by now displaced the long wire aerials which some stations had preferred, just prior to the war, to simple dipoles. With concentrated lobes of radiation, contacts began to surpass both in range and in regularity the dreams of the earlier workers on this band.

The years 1947 and 1948 produced a diversion to a slightly lower frequency. With the sun-spot cycle at its highest peak since 1778, occasional contacts of trans-oceanic range became possible on frequencies approaching 50 Mc/s. during the autumn and late winter of these two years. As a result of negotiations by the R.S.G.B., British amateurs were granted limited permits for operation on this band, which had for some time past been officially opened to American amateurs, and a fine range of contacts is to be found recorded in the BULLETIN. But the sun-spot cycle fell away from its peak and in March, 1949, the 56 Mc/s. band, or more accurately the 58.5 Mc/s. band as it had been since 1946, was closed to make room for the Birmingham television service.

Attention was rapidly concentrated on 144 Mc/s., which was already quite well occupied and where most stations started with crystal-controlled transmitters and efficient converters working into communication receivers. A typical example of a crystal-controlled transmitter for this band, designed by G2NH and later reproduced by many leading stations, appeared in the August, 1948, issue.

Meanwhile, 420 Mc/s. had been attracting interest in the pages of the BULLETIN, with descriptions of stabilised equipment, and at the time of writing there is probably no country in the world having such a high proportion of stations equipped with modernly devised equipment for this frequency as can be claimed by Britain.

The year 1948 resulted in the BULLETIN publishing details of equipment used by some members on the 2,350 Mc/s. band.

Aerials

At the start of the period under review stations were already familiar with the use of an earth connection or counterpoise on the longer wavelengths. Most stations accordingly used a counterpoise on 45 and 23 metres. It generally functioned more as part of a Hertz system than at constant

potential, but provided the lengths of the aerial and counterpoise did not happen to be inopportune the whole system would resonate and radiate well. Information was not at that period readily available on the use of a wire cut to a half-wavelength, erected high and clear, and excited through a feeder system.

It is not until about 1927 that the *BULLETIN* pages contain contributions from members dealing with aerial operation of this type. But with the shifting of the wavebands to our present harmonic relationship we find the 66-ft. wire voltage fed with tuned feeders at one end (often called the Zeppelin aerial on account of its original use some years before), beginning its long reign of popularity so well deserved on account of its ease of erection, tuning and multi-band operation.

Twin non-resonant feeders of about 600 ohm impedance were not too popular as they restricted operations virtually to one band, but we note the favour accorded to the Windom aerial, in which a single wire feeder is tapped to a matching point along a half-wave wire to result in a matched termination. It became widely used in Britain and the Empire, for it radiated excellently, and could be operated as a long-wire system on harmonic wave-bands. Curiously enough it was never widely adopted on the Continent or in the United States. These systems (we will consider beam aerials separately), were constantly described and compared in the *BULLETIN* pages and formed the main-stay of general purpose aerials at the bulk of British stations till the outbreak of war.

On the resumption of transmitting from 1946 onwards, we note a surprising revulsion against tuned feeders. Non-resonant lines of impedances around 70 ohms for co-axial construction and 300 ohms for those of the ribbon type had been so widely developed and used for Service equipment that operators turned to them in increasing numbers. Such feeders entailed a considerable reduction in multi-band versatility, but the sun-spot cycle was near its peak, permitting unsurpassed 28 Mc/s. communication. Beset with the urge to work 100 countries and then press forwards towards the second century mark a high proportion of stations showed themselves quite prepared to sacrifice multi-band operation in order to concentrate on 14 and 28 Mc/s. arrays, fed by low impedance lines.

Here let us re-trace our steps to examine the growth of beam aerials. The *BULLETIN* for November, 1927, summarised a talk given by E. J. Simmonds (G2OD), at that year's Convention on "Beam Antenna Systems for Five Metres." Diagrams showed how high angle and backward radiation could be obviated by the use of a reflector and directors forming a vertical array, but no indication was given of tests actually carried out. The article was much ahead of its time, for we find that in the 1935 B.E.R.U. Contest only one of the leading stations (VK5SU), used a beam aerial (described as a "14 Mc/s. parabolic beam" and so presumably fixed in orientation).

In March, 1936, G5KG discussed long distance tracks with the aid of Eckersley and Tremellin charts, mentioning that his Windom, with reflector, gave results beyond expectation. The first really constructional article on beams was published in December, 1937, when D. W. R. McKinley, VE3AU, gave details of his "Efficient and Inexpensive 14 Mc/s. Beam." This was a vertical Windom, with reflector, and it was not till June, 1938, that solid di-electric feeders were mentioned. By this time interest in directional systems was fully aroused and subsequent issues of the

BULLETIN contained frequent information ranging from fixed systems of the flat-top or of the curtain type to the 3- or 4-element rotary assemblies, which permit so high a rate of scoring in contests of the present day.

Contact Bureau

From the start the *BULLETIN* served to keep members in touch with activities and circuits favoured by their colleagues. Each issue contained numerous short articles describing experiences or theories to confirm, in addition to a considerable proportion of space being devoted to *District Notes*. The *BULLETIN*, being primarily a members' journal, has never employed full-time professional staff working on the construction of equipment, unlike its American counterpart *QST*, and so has seldom published more than perhaps a couple of articles on particular receivers and transmitters each year. Even so, it has always assumed that members could read a theoretical diagram and carry out the necessary construction from a sketch or photograph of the layout. This policy has enabled the greater part of the *BULLETIN* pages to be devoted to short practical contributions which in the earlier days ranged from about a half column to one column in length, but which now—with the increasing complexity of equipment—average a page or more apiece.

In view of the numerous contributors it was the practice for many years to apportion these to various groups according to their different interests and specialities. Members would report on circuits which they had found satisfactory or otherwise, give brief constructional hints and sketches on the adaptation of components, compare experiences and in general provide a considerable amount of useful data for their colleagues.

The assembly of all these groups was called *Contact Bureau*, and starting in November, 1927, it functioned practically throughout the 1930s.

In group work of this nature much of the successful organisation depends on the wise selection of the group managers and the overall Bureau Manager. It was due to the enthusiasm and relentless work of members such as T. Palmer Allen (G16YW), the late H. L. Powditch (G5VL), H. Cecil Page (G6PA) and A. M. Houston Fergus (G2ZC), who held in succession the post of C.B. or R.E.S. Manager, that so much detailed information became available for readers of the *BULLETIN*.

Conclusion

Lastly, to conclude with a note of personal regret. To cover twenty-five years in a few pages, so few are the achievements that can be mentioned; so high rise the piles of notes that must inevitably be set aside.

The *BULLETIN*'s continued appearance throughout the war years; the links it made with Service members, when many types of article could not be published for security reasons; the numerous contributions on measurements and circuit design; the day-by-day observations by D. W. Heightman (G6DH), on upper frequency limits; contest reports, where hours of cross-checking of logs must be converted to barely a page of print and tables; the "Month on the Air," where letters from cross-town and from cross-continent must similarly be analysed and condensed; the unnoticed Editorial struggles month after month to compress print and illustrations into the restricted, yet balanced, lay-out; the hundred and one other subjects all so deserving of record yet impossible to detail in a single brief survey—for all such omissions the writer can but offer his humble apologies.

In the Workshop

GENERAL WORKSHOP WRINKLES

SO far in this series we have covered a fairly large number of the more formal mechanical processes which are essential in the amateur workshop. It is now proposed to deal with some miscellaneous problems which occur from time to time, and the methods of dealing with them. Ingenious ideas, "wrinkles," "gadgets," etc. are a stock-in-trade of the enthusiastic amateur, springing from the ever-present necessity for improvisation.

Many of the ideas to be mentioned are perhaps not novel and no claims of originality are made. However, it may be helpful to members to see these ideas presented collectively, so that use can be made of them when the need arises. It would be indeed a great service to the Society if members would send in solutions they have found to their own small mechanical or constructional problems, in the true "ham" spirit of "help-one-another."

Cutting Slots in Coil Formers

It quite frequently occurs that a spaced winding on a so-called "low-loss" ribbed moulded former is required and it is not always possible to obtain such a former with the requisite slots provided. As will be realised, it would be a lengthy business to mark-out accurately the position for the slots on, say, a six-ribbed former, and then to cut each slot neatly and cleanly to a specified depth with a hacksaw. The following idea (see Fig. 1) is submitted as providing a rapid and easy solution for cases where the wire spacing does not require to be greater than 2 to 3 wire diameters, assuming wire gauges of 16 or 18.

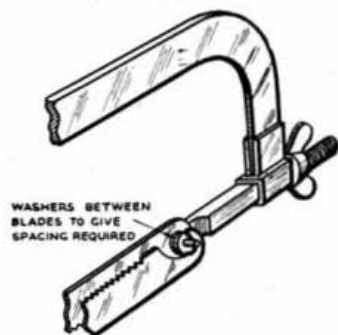


Fig. 1
Twin hacksaw blades arranged to simplify the slotting of coil formers.

Operation: Take the hacksaw frame and insert a normal or fine blade on the pins. Now place a number of, say, 4 B.A. washers on the pins to give the spacing required. Then fit a second hacksaw blade on the pins in "reverse," as it were, i.e. with the teeth uppermost. Tighten up the tensioning nut very firmly and you will have on the frame the two blades running accurately side by side.

Now place the former to be cut in the vice (across the vice if possible so as to avoid fracturing it by squeezing), and cut the first slot accurately for position and depth in one rib with a hacksaw blade held in the hand. Take the hacksaw frame and place it so that the "blank" blade takes its position in the first slot just cut (it may be necessary slightly to tilt the frame when doing this). Then commence to saw slowly with minimum pressure

keeping the frame vertical and square to the former. The depth of the cut will be automatically regulated by the blank blade coming to the bottom of the first slot which was cut. Proceed to cut the next slot by bringing the blank blade into the preceding slot until the requisite number has been achieved. Turn the former in the vice to bring the next rib into position and proceed in precisely the manner described above.

It will be observed that the method does not produce a helical or spiral wind—the turns are parallel and at right-angles to the axis of the former, the wire slanting to the next turn between two adjacent ribs. For those who wish, it is, of course, possible to produce a helical winding by staggering the starting cut on each rib successively by a dimension given by dividing the spacing by the number of ribs of the coil former. This is a refinement of which the results are more noticeable in appearance than in any electrical effect on the Q of the coil.

A similar technique can be applied to ceramic coil formers with success, but the process is rather tedious. Instead of using a new or serviceable blade as the cutting agent, take an old blade and grind the teeth off until only slight serrations remain. Fit to the holder as before, smear with oil and add a small amount of carborundum grinding paste to the serrated edge. Proceed as previously with great care to avoid chipping the ribs.

For slotting formers where finer wires are to be used, say 20 to 24 S.W.G., the set of the teeth on the "cutting" blade may be eased off on a grinding wheel to give a narrower slot. The back of the "guide" blade will require similar treatment.

Chassis Construction From Sheet

In general, the amateur finds it convenient to purchase chassis ready bent-up at reasonable prices, but to those to whom mechanics appeal, the process involved is quite simple and straightforward, and considerable time will be saved if the dimensions are not of stock size. The only equipment required in chassis bending is a good strong vice having not less than 3 in. jaws, and a supply of 1 in. x 1 in. or 1½ in. x 1½ in. angle iron, reasonably straight and clean.

Operation: Take a piece of aluminium sheet and mark out accurately the plan form of the finished chassis with a scriber. Then mark out a second rectangle outside the first to form the sides, after folding, of the requisite depth: see Fig. 2(a). Next mark out the square portions in the corners which have to be removed before the "box" can be formed.

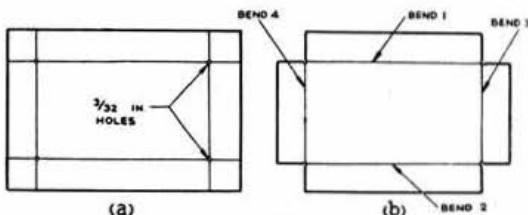


Fig. 2
(a) Sheet cut out and marked. (b) Sheet ready for bending.

RADIO AMATEURS' EXAMINATION

To be held in London in October

WHEN it became clear that the City and Guilds of London Institute could only hold one Radio Amateurs' Examination each year the Society enquired whether the Post Office would be prepared to organise an additional examination on the understanding that the entry would justify the work involved.

The Society is now able to announce that the Post Office have decided to arrange, for the current year only, and on condition that they receive by 1st September, 1950, not less than 100 applications, an examination to be held in a convenient hall in the City of London or its immediate vicinity, between 2.30 p.m. and 5.30 p.m. on Saturday, 7th October, 1950.

The examination will be distinct from, but based on the same syllabus as, the Radio Amateurs' Examination held by the City and Guilds of London Institute. The fee for this examination will be £1. This amount should be remitted by cheque, money order or postal order, made payable to the Postmaster General and accompanied by the candidate's application to sit the examination. Applications must be received by not later than 1st September, 1950, and should be sent to: The Inspector of Wireless Telegraphy, G.P.O., London, E.C.1.

Acknowledgments will be sent to each candidate, who will be informed of the actual place of examination in London.

The City and Guilds of London Institute will not be associated with the examination and a comparison between the severity of the examinations will not be admissible.

The Post Office wish to make it clear that they cannot undertake to hold an examination anywhere other than London or to commit themselves at this stage to holding an examination in London next year.

TV AERIALS

EXPERT guidance on television aerials is given in a booklet recently issued jointly by the Radio and Electronic Component Manufacturers' Federation and the British Radio Equipment Manufacturers' Association to the surveyors of local authorities throughout Great Britain and Northern Ireland.

The purpose of the booklet, which is intended also for private property owners, is to show that there are many factors which must be taken into consideration before the type of aerial most suitable for any particular building or district can be decided, and it is emphasised that the crux of the matter is that these factors can be ascertained only by means of tests carried out on the site. The booklet gives the names of firms who have been providing testing facilities for some years and are ready to advise local authorities and property owners on aerial installations which will provide adequate reception for tenants without detracting more than is absolutely necessary from the architectural amenities of the building or district.

Factors affecting reception are listed, communal and multi-point systems for blocks of flats are briefly described and eight types of television aerial—of which the "H" shape is only one—are classified and illustrated.

The booklet (obtainable from the Secretary, R.E.C.M.F., 22 Surrey Street, London, W.C.2, post free 1s.), concludes with a plea to motor vehicle owners to eliminate interference at the source by fitting a suppressor costing not more than 2s.

Now carefully saw out the sheet to the outer rectangle and clean off the edges. Drill a 3/32in. hole at the corners of the squares as indicated and then saw out the squares—shears may be used, but are liable to warp the sheet: see Fig. 2(b). Next take two pieces of angle-iron, each somewhat longer than the plan form, place in the vice jaws and then accurately set so that the subsequent bend will take place on the marking-out line. Bend the chassis in the order indicated in Fig. 2(b) using a wide block of wood and a heavy hammer. Do not on any account hammer the sheet itself or try to push over with the hands alone. Always try to obtain a clean, sharp bend.

Now cut two pieces of angle-iron to a length equal to the designed width of the chassis less twice the thickness of the metal sheet. Place these in the vice as before with the scribed line for the sides of the chassis accurately placed. Proceed as before, until the "box" form is complete. In commercial manufacture the corners of the chassis are usually welded, but a satisfactory and easy method for the amateur is to fit small brackets in the corners with screws and nuts.

A Simple "Screw Vice"

A very frequent operation in radio construction is that of cutting-off screws to length. The usual method of putting the head of the screw in the

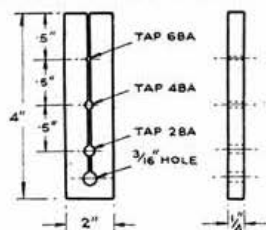


Fig. 3

Simple home-made vice used for cutting 2, 4 and 6 B.A. screws.

vice often results in mutilation, and the screw frequently jumps out in the process of sawing.

A very simple "gadget" is shown in Fig. 3 which overcomes this difficulty very satisfactorily. It protects the screw-head and thread from damage and acts as a guide for those who cannot saw "square." The device consists of a piece of mild steel, of any suitable dimensions, though recommended dimensions are given. Holes are drilled and tapped for 2, 4 and 6 B.A. and for other sizes desired. A fine splitting is then used to saw through the piece of steel, bisecting the tapped holes and running into the 3/16in. hole at the bottom.

In use, the screw to be sawn is screwed into the appropriate hole to give the required length, the plate is put in the vice and squeezed up to grip the screw firmly. The screw is then sawn off, using the face of the plate as a guide. It is then withdrawn and the first thread eased off with a file.

Thus, mutilated screws are avoided, the thread is protected and the annoyance of nuts binding or refusing to grip is avoided. If desired, the plate can be nicely finished off and hardened, when it will take its place as a useful piece of equipment.

Correspondence

A number of readers have been good enough to comment on the various subjects considered in this series of articles and, in several cases, to offer alternative suggestions. It is hoped to collect these and present them in a later issue.

LONDON O.R.M.

Mr. W. H. Matthews, G2CD has expressed a wish to be dissociated from the report of the London O.R.M. which appeared in the June BULLETIN.

We regret that the initials W.H.M. were appended in error to the report.

THE MONTH ON THE AIR

By A. O. MILNE (G2MI)*

Low Power

NO apology is made for returning once again to this subject. Prompted by the success of Field Day and by the enthusiastic reports from those who regularly use QRP, we urge all members who want a new interest in Amateur Radio to give low power a fair trial. There are many advantages, not the least of which is less T.V.I. Again, the real performance of a beam aerial can most readily be checked when the energy supplied thereto is a fraction of a watt! There is considerable scope to be found in the development and construction of truly miniature equipment. And endless fun in getting results! Some may even rediscover the art of using a straight receiver!

Consider the work of G8DL who, using 5 watts, worked all continents during April of last year and includes among his contacts UA1, UA3, UA9, UB5, UI8, CX, VK5, ZL4 and ZS. The transmitter originally consisted of a 6C4 M.O.—6AK5 doubler—6AK6 P.A. A later development is a 9002 M.O.—6AK5 P.A. Input 0.9 watt. This little transmitter is over-shadowed in size by a packet of 20 cigarettes!

N.F.D. Calls Heard

N.F.D. operators may be interested to see DX reports of the reception of portable stations received during the month.

They provide further examples of what can be done with QRP. G3FMU aboard the M/V Kurdistan, 200 miles east of Ceylon, heard the following stations on 7 Mc/s.: G8RC/P working HB1HT at 0004 (RST 339); G8IP/P calling CQ at 2315 (339); G3YY/P at 2326 and G3DQC/P at 2331 (both 339); G2AJ5/P, 2340 (329); G3AZ/P, 2353 (459); G4MF/P, 2354 (239); G3VM/P, 2356 (449). G2DU/P, G2RT/P, G2WW/P and GW3ELM/P were also heard. A letter from Eric Trebilcock, BERS195, near Melbourne, brings more N.F.D. news. G5ZT/P, G5YY/P, G3AFT/P, G5ML/P, G5FN/P, G2HNL/P and G8RC/P were all heard on 7 Mc/s. Eight Swiss portables, MP4KW/P and ZB1X/P were also copied. MD4KW was S8 at times.

With 1.2 watts input G2MI/P worked one HB and one PA portable on 3.5 Mc/s. at RST569, using the equipment described in the December, 1949, issue of the BULLETIN. Incidentally these results were obtained with crystal control on 3521 kc/s., probably the most crowded part of the band.

Notes and News

BERS195 hears VR2AA and PK6NL most days at 0800 G.M.T.—yes! on 7 Mc/s. VR1C has just QSL'd. He is W6PZ, who also operates KX6BA. G3BPP of Middlesbrough lists these nice DX plums: PK1RI, VS6AC (14060 kc/s.), VU2NG (14038), Y13DYN (14052), MS4FM (14068), CR7RF (14080), EQ3FM (14055), PJ5TR (14020). He also mentions that a three-element beam indicates that India is the main production centre of QRN during the monsoon season. VK1YM is now active in Macquarrie Island: Try 2030 G.M.T. on 14 Mc/s. C.W.

GM3CEJ has shown us a tragic QSL from VE8OL. This card, together with his own original card, was salvaged from the wreckage of an air

Contests Diary

Direction Finding Contests.

July 23: Edgware.

August 13: Romford.

420 Mc/s. Tests.

August 20: 1100 B.S.T. to 2300 B.S.T.

liner in which VE8OL and all on board were killed, whilst returning home from the far north. VE4EH has forwarded all the cards found in the 'plane to their destinations.

BRS1066 has heard from Y13DYN. The YI has forwarded his first 200 cards and says that everyone will be QSL'd in due course. ZE2JR's transmitter is built into an old refrigerator, with an 813 in the freezing unit. The 'frig is still in working order but we have no information as to whether a little cooling is necessary when the TX is on the air! BRS14549 is now ZE3JL.

TA3FAS assures us that AJ3F and AJ4EN are quite legal. The frequency is just under 21 Mc/s., being in fact 20994 kc/s. They are both Military Amateur Radio Service stations. AJ3F is in Ankara, Turkey, and '4EN is in Wiesbaden, Germany. G3ATU says that PK6LN, who QSLs, is now very active on 14115 kc/s. between 1630—1930 G.M.T. His QTH is Box 76, Macassar, Celebes. VQ8AU, with a T4 note and a wonderful H.F. drift, gives his address as Box 13, "Gagos!" G3ATU is probably as near to "Chagos" as this VQ8AU! BRS16304 reports that VQ3AA is now in Mombasa, signing VQ4AA, while VQ3AK is still in Dar-es-Salaam. He mentions the wealth of Spanish speaking 'phone DX on 7 Mc/s. in the early hours of the morning: particularly LU, CO, XE, HK and PY.

G3TK has shown us a letter just received from C8FP confirming contacts with G3TK, G6ZO, G2FSR, G3BQ, G4CP, ZL1HY, ZL2GK, G2VD and G2COP. The A.R.R.L. and "CQ" magazine have been informed. G6RH has received his W.A.P. and W.A.Z. certificates and also the sixth W.A.A. (Worked All America) from Brazil. This is believed to be the first W.A.A. award issued to a U.K. station. G6RH has now applied for the African W.A.A. Surely a fine record of achievement!

G3ERE, who is ex-VS2AR, has QSL'd everyone with whom contact was made. He is now living in Bath, Somerset. G3AJP congratulates BRS7594 on getting a card from YK1AC. He wonders if this station only QSL's reports since his contact plus three cards have so far elicited no reply. He also mentions that W2OXE/MM, the schooner *Bowdin* of the McMillan Expedition is on the air. This news will stir the memories of many old-timers.

W2GT passes along the tip that FP8AC is now active in St. Pierre. Schedules can be arranged via KV4AA. HK3BJ and HK3DZ have been heard by BRS16304 working cross town contacts on 7 Mc/s. between 0100 and 0300 G.M.T. BRS7594 of Yeovil comments on the generally poor conditions on 14 Mc/s. He has heard HV1A who states that he is in the Vatican City. We seem to have heard that story before!

*29 Kechill Gardens, Hayes, Bromley, Kent.

VE8NF, 0855 (14170 kc/s.) at Cambridge Bay and VE8SQ, 1106 (14170 kc/s.) at Clyde River, Baffin Island have been good signals recently. In fact VE8's are often well received in Britain when conditions on 14 Mc/s. are otherwise poor. VP3MCB, 2158 (14345 kc/s.); H16EP, 2110 (28350 kc/s.); ZP3AW, 2125 (28340 kc/s.) have also made regular appearances lately.

VQ4RF will be QRT during July and August when he will be on holiday in South Africa. FF8JA will also be on holiday during July. ZB2J is now QRT. PK1UA is returning to Holland shortly. Ex-G2SO, now ZE3JO, who is active on C.W., 14050 to 14100 kc/s., is looking for G contacts, but misses the old top band and 3.5 Mc/s. ragchews!

CT1UY asks ZC1AZ to QSL. 'AZ whose present whereabouts are unknown at the QSL Bureau sent many hundreds of cards. But perhaps this one went astray. If anyone knows his present QTH, please pass it along to G2MI. MF2AA in a recent QSO stated that DL2CU is now MF2AD, while MF2AC has left Trieste. MF2AB is still active on C.W. and '2AA on 'phone.

GM3CSM has just made his W.A.S. and E.DX. certificate. Congratulations O.M. He offers as his contribution this month: KR6CA, 1820 G.M.T. (14005 kc/s.); VP8AK, 1920 (14018); MS4FM, 1855 (28100); FF8JC, 1930 (14018); PJ5CW, 2210 (14015). QSL PJ5CW, who is ex-PAoCH, via W8CED.

Can anyone clear up the VS8CE mystery? The prefix is the official one for Balereim but so far as we can ascertain has never been officially used.

Islay

G5LF has given us details of the apparatus he intends to take to the Hebrides. The whole outfit is built into a TU5B case and consists of a 3 valve T.R.F. receiver using three 6SH7's; a high gain two stage modulator 6SH7—VT510; and a V.F.O.—P.A. transmitter, 6SH7—VT510. The entire unit weighs 27 lb.

Flash

As from July 10, R.A.F. amateurs in Iraq are back on the air. Official.

An Invitation

G2MI would like a rest from writing "Month on the Air," a task fulfilled for nearly 10 years. Is there any member with a typewriter; the time and enthusiasm; and the necessary experience, who would like to take over? If so, please write to the Hon. Editor at his home address.

Braille Technical Press

THE Society is able to announce that arrangements have been made for subscriptions to *Braille Technical Press* to be accepted at Headquarters at the annual rate of 45/-.

The purpose of this new monthly publication is to provide sightless radio enthusiasts with up-to-date technical information. The April issue, a copy of which is now available for inspection on application to Headquarters, contains articles on a wide variety of subjects, including how to pass Amateur Radio examinations, sound recording and reproduction, test equipment for the blind, a simple auditory milliammeter, audio amplifiers, simple low power phone and telegraphy transmitter, the use of tools, etc., etc.

Braille Technical Press published by Robert W. Gunderson, W2JIO of New York is a non-profit making organisation managed by a Board of Directors who will direct its policy. One half of

the Board's membership will be made up of blind amateurs holding any grade of licence; the other half will be men in the electronics industry.

Direction Finding Contests

THE second of the four R.S.G.B. D/F Contests, announced in the June, 1950, issue (p. 429) of the *BULLETIN*, will take place in the Romford, Essex, area on August 13. Members are reminded that they may participate in as many of the first three events as they wish: July 23, Edgware; August 13, Romford; September 3, High Wycombe.

Details of the Romford event are as follows:
Call Sign: G4KF/P. **Frequency** 1870 kc/s.
Assembly Point: Romford Market Place (NGR 51/512888).

Map: Ordnance Survey, New Popular Edition, Sheet number 161.

Assembly Time: 1330 B.S.T. **Test Commences:** 1400 B.S.T.

Intending entrants should notify Mr. R. Grubb, G3FNL, 64 Deyncourt Gardens, Upminster, Essex, not later than August 1, 1950, of their intention to compete (enclosing 2s. 6d. per head, if tea is required).

Technical Congress

THE Council has regretfully been compelled to abandon the idea of holding a Technical Congress during 1950.

It had been planned to hold the Congress within the precincts of Birmingham University but, due to other commitments, including a gathering of the British Association, the University authorities are unable on this occasion to offer accommodation.

The Council intends to review the position again early in 1951 with a view to holding a Congress during the autumn of that year.

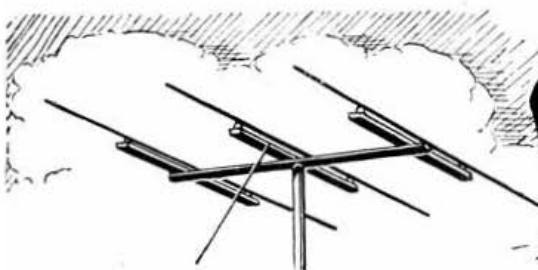
Editorial (continued from page 5)

it! One day, we hope, it may be possible to include in each issue enough articles on each subject, in each scale of treatment, to suit every member. Such is the Utopia of which Editors dream!

The credit for the success of the *BULLETIN* is shared by many: the early pioneers; the innumerable contributors of both occasional articles and regular features; the advertisers who have so generously supported our journal; and all those who, in any way, have been associated with its production. Time is a precious commodity to the radio amateur, yet much has been willingly given, by many, to make the "BULL" a worthy journal of a great hobby.

This month members will notice certain changes which, it is hoped, will eventually pave the way to further expansion of the *BULLETIN*. The contract for the printing of this—the Twenty-sixth Volume—has been placed with the *South London Press, Ltd.* It will readily be appreciated that a change of this nature must inevitably, for a time, result in some dislocation to normal production schedules and variations in general appearance. All will wish to bid a warm welcome to our new printers and to extend our thanks to Sir Joseph Causton & Sons, Ltd., for their services during the past eleven years. J.P.H.

MAKE A NOTE OF THESE DATES
June 22nd to June 24th, 1951
FESTIVAL OF BRITAIN YEAR
NATIONAL CONVENTION



AROUND THE V.H.F.'s

First G/DL Contact on 2 Metres

By W. H. ALLEN, M.B.E. (G2UJ)*

ON June 9, 1950, yet another European country was added to those already contacted from the British Isles on two metres, and our congratulations go to the two operators of G3DIV/A (Eastbourne) and to those of DL4XS/DL3KE—another jointly owned station—at Wiesbaden, Germany, for their very fine achievement.

On June 5 and 6 weak signals had been heard in Eastbourne from DL3FM (Essen), but seemingly the British station was not heard in Germany. Three days later G3DIV/A was in QSO with ON4YD (Antwerp), and although conditions were not apparently outstanding, the Belgian station suggested trying for DL, as some German stations were audible in Belgium at the time. Shortly afterwards DL4XS/DL3KE was heard on 144.45 Mc/s., and came back to a CQ call from 'DIV'. Reports of RST 579 were exchanged at 2247 G.M.T., the distance being 365 miles. Two days later a second contact took place, this time on 'phone with signal strengths of R5 S6. From this contact and a subsequent letter were learned the details of the careful preparations made by '4XS and '3KE to achieve the first contact between Germany and this country on two metres.

Their home QTH in Wiesbaden is unsuitable for V.H.F. work, so a station was erected in a hut on a nearby mountain side 5 miles from the nearest building and commanding a view of 50 miles in all directions. At this exposed site special precautions had to be taken to safeguard the hut from being swept away from its foundations by the wind. The problem of providing power for the operation of the station had also to be overcome. Experiments with various types of aerial arrays and receivers occupied some 18 months, but finally the aerial design which showed the most promise proved to be a vertical stack of five pairs of half wave elements, basically similar to the design by G6UH and G6CJ published in the September, 1949, issue of the BULLETIN. The most successful receiver consisted of a triode-connected 6AK5 and a 6J4 arranged in the Wallman Cascode circuit followed by a 6AK5 triode-connected mixer, a 9002 oscillator and a further 6AK5 I.F. amplifier. This combination possessed the very good noise factor of 4.7 db. The transmitter is a B.C. 625 with an 832 driving an 829B to 80 watts on either 'phone or C.W.

The equipment at the Eastbourne station—G3DIV/A—is similar so far as the transmitter is concerned, with an input of 70 watts, but the aerial is a 4-element wide spaced Yagi. Two converters are available; one has a neutralised 6J6 push-pull first R.F. stage, an EF54 second R.F., EF54 mixer and 9002 oscillator, the other employs 6J6's throughout to a design by G2IQ. The main receiver is a Hammarlund HQ120. The noise figures of these converters are not available.

It will be seen that at both stations particular care has been taken with the design of the receiving equipment, and also, at the German end, with the

high-gain array, both important factors where long distance operation is the main consideration.

An extraordinary thing about this event is that—unlike most two-metre "openings"—so far as is known, no other G/DL contacts were made on either occasion, although we learn from G2CPL (Lowestoft) that he heard DL4XS at RST 559 on both June 9 and June 11.

Two - Metre Station Reports

G2CPL (Lowestoft) found conditions somewhat patchy during June, after the exceptional results of the previous month, but activity remained at a reasonably high level. Daily skeds. with GW2ADZ (Llanymynech) and G3EHY (Banwell, Som.) were maintained at distances of 205 and 225 miles respectively: 15 out of a possible 25 contacts resulted with 'ADZ; and 17 out of a possible 31 with the Somerset station. DL3FM (Essen) was heard between June 5 and 10 at strengths up to 589 calling CQ in the late evening, but no reply was received to repeated calls. PA0JW was raised on a CQ call at 2140 G.M.T. on June 12, and later PA0EO and PA0BM were worked on 'phone with S9 reports, but there was no other U.K. activity to take advantage of what appeared to be an excellent Continental opening. G2CPL is at present operating the following skeds. on a frequency of 144.81 Mc/s.:

Time G.M.T.	Call	Location	Transmission
1830-1850	G3FIJ	Colchester, Essex	C.W.
1850-1910	G3ANB	Brightlingsea, Essex	C.W.
1910-2000	G3VM	Norwich, Norfolk	'phone
2010-2020	GW2ADZ	Llanymynech, Mont.	C.W.
2100-2120	G3EHY	Banwell, Somerset	C.W.

G5MR (Hythe, Kent) continues to work F8OL (near Paris) about five times a week over a distance of 162 miles. During June the sked. never failed, and signal strengths of up to S9 were recorded in each direction. An interesting effect has been noticed on F8OL's signals on two or three occasions by 5MR, particularly on June 20 when the French station was much weaker than usual. The signal strength increases momentarily by 2 or 3 S-points in a way often noticed in the past on the 5 metre band, and then ascribed to reflection from meteors or from meteoric trails. The present effect occurs when storm static is present, and mostly appears to coincide with the louder crashes. Any suggestions for a possible explanation of this phenomenon would be welcomed both by 5MR and by the writer.

G3EHY (Banwell, Som.) has been concentrating on the north of England and has succeeded in hearing G3BW (Whitehaven, Cumberland) on most evenings except for the periods May 23-26 and June 15-21. Contact was effected on several occasions over the distance of 232 miles. GM3BDA (Airdrie, near Glasgow) heard the Somerset station on several evenings during the first two weeks of June, and the Scottish station's signals were heard by 3EHY on May 31 and June 4. It is hoped to establish two-way contact shortly.

Among those northern stations worked recently

* 32 Earls Road, Tunbridge Wells, Kent.

by 'EHY are G3ATZ (Chester), 6MX (Timperley, Cheshire)—with 10 watts—5TH (St. Annes-on-Sea) and 6TF (Sheffield). In addition G3GL (Northallerton, Yorks.) has been worked several times. All the above contacts have been made between 1700 and 0100 G.M.T., but a lunch-time call at 1300 G.M.T. has raised G3CHY and 8SB—both in Lancs.—on several occasions.

G3EHY maintains three regular skeds. at the present time; 1300 G.M.T. CQ call to the north, 1800 with GW2ADZ and at 2100 with G2CPL. He points out that there is little hope of London stations raising him unless he is heard calling "London" or "S.E." as otherwise he will be searching the known frequencies of the northern stations.

News from Australia

We learn from G6UH that on March 27, the Australian 2 metre record was raised from 190 to 270 miles as a result of a contact across the Bass Straits between VK3AKE on the Australian mainland and VK7PF in Tasmania. Later, on the same day, VK3BW worked VK7MC while VK7PF heard VK3ABA, 'BW and 'ED, but failed to raise them.

News from Scotland

GM3DDE (Largs), and GM3DIQ, 14 miles away in Stevenston are doing what they can to excite some interest in V.H.F. work in the county of Ayrshire. 'DIQ is situated some 400 ft. a.s.l. and has worked G3BW, 8SB and G1GYP in addition to GM2DI, 3BDA, 5VG and 6WL. GM3DDE's site at Largs is at sea level, however, and much hemmed in by high ground, so that it was with considerable satisfaction that he contacted G12FHN (near Belfast) on June 19. Should there be others in this area who are contemplating operation on the V.H.F.'s either of the above-mentioned amateurs would be most happy to contact them.

Seventy Centimetres

G5TP (Stoke Row, Oxon.) worked G5BY (Thurlstone, Devon) at over 150 miles on June 4, only a few hours after the record mentioned in our last issue was set up between G5BY and 6LK (Cranleigh, Sy.).

It is learnt from G5MR (Hythe, Kent) that F9AE (Neuilly, near Paris) has been running a sked. with F8GH over a distance of about 50 miles for the past three months, and is anxious to contact this country. His frequency is 434.85 Mc/s.

DX T/V

We are informed by Karl Svensson, SM3ZF, of Vigge in the north of Sweden that both he and SM3AGX received the sound and vision channels of the Alexandra Palace T/V on several occasions during the second week of June. The strength of the sound transmission between 0915 and 1045 B.S.T. was around S9 on a National NC57 receiver connected to a long-wire aerial.

R.S.G.B. 420 Mc/s. Tests

August 20, 1950

LAST year when the first R.S.G.B. 420 Mc/s. Tests were being planned, activity on the band was confined to small isolated groups of members, with few if any links between them. The results of the event, in which 37 stations took part, have passed into Amateur Radio history. All previous U.K. 420 Mc/s. records, both for fixed and portable stations, were broken many times during the day.

Since then progress on 420 Mc/s. has been steady, if less spectacular, with distances creeping up as stabilised equipment and efficient receivers become

more general. During recent weeks, also, two factors have emerged which may have a considerable influence on 420 Mc/s. progress: there is now little doubt that medium distance amateur contacts by means of tropospheric propagation are possible; and petrol rationing has ended. The amateur who seeks long distance contacts on this band is thus better able to choose a location at which temperature inversions are most likely to occur—and to transport his equipment there without anxious glances at the petrol gauge.

But not even the most ardent 420 Mc/s. enthusiast would claim that activity has yet reached a level which would permit a normal point-scoring contest to be held on the band with any chance of success. So for the second year, this U.H.F. event will be known as the "R.S.G.B. 420 Mc/s. Tests" and the award of the trophy will not be directly dependent upon the number of contacts made. As in 1949, there will be few fixed rules, other than the general time limit of from 1100 B.S.T. to 2300 B.S.T. on August 20, 1950, and the provision that all entries must be from fully paid-up Corporate members and accompanied by the Declaration set out below. Any type of operation—fixed or portable—or mode of transmission may be used, providing that the entrant adheres to the terms of his (or her) licence.

The entries will be required to include details of stations heard and worked (with distances), and general observations on the band. A full description of all equipment used should be included and this information and any other evidence submitted of work carried out will be taken into consideration when judging the event. The contestant submitting the best entry in the opinion of the judges will be recommended to Council for the award of the Arthur Watts Trophy.

Entries

Entries headed "R.S.G.B. 420 Mc/s. Tests" must be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, postmarked not later than September 4, 1950, and contain the following declaration:

I declare that my station was operated strictly in accordance with the rules and spirit of the Tests, and I agree that the ruling of the Council of the R.S.G.B. shall be final in all cases of dispute.

Date Signature

Ten Minute Quiz

This month's posers for the radio enthusiast.

1. What is a "discriminator"?
2. Name at least three types of distortion which occurs in audio frequency amplifiers?
3. How many amateur callsign prefixes are there in the U.S.S.R.?
4. If $Z = \sqrt{R^2 + (2\pi fL)^2}$ find the approximate value of R when $Z=10$ and $2\pi fL=6$?
5. What is MSF?
6. What is the common use for mu-metal shields?
7. What is the "wet" in a wet electrolytic condenser?
8. Where is "shot noise" produced?
9. What are the frequency limits of the 50mm. amateur allocation?
10. Where was the idea of the BULLETIN originated and by whom?

Now turn to page 33 and see whether you have beaten the Question Master.—H.E.B.

H. WHITAKER G3SJ

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WALKIE TALKIE.—Nr 48 Mk 1, Complete new and boxed with all accessories and valves, 1000 kc. xtal, less batteries, £14 10s.

B.C. 221 FREQ. METERS.—New £17 10s.

LAVOIE U.H.F. Freq. Meter.—A precision laboratory meter covering the range, 375 to 725 Mc. Model T.S.127/U. Individually calibrated 0/200 Westinghouse Micrometer for visual indication Fil. time switch up to 15 minutes. Mod. switch, phone jack, and gain control, in grey crackle steel cases 11" x 8" x 8" with carrying handle, £7 10s.

METERS.—Ferranti Desk-type, 3" 0/1 mill, in sloping panel desk housing, with top terminals, 25/-; 3" round flush M/c 0/200 mills, 10/6; Sun 0/1 mill 2" round flush, 10/6; 2" square Thero couple 0/1 amp. 3/-.

CRYSTALS.—R.C.A. cr Bliley 100 kc. sub-standards, 17/6; 1000 Kc. standard 3/4" pin spacing Somerset, Bliley or Valpey, 20/-; 500 Kc. British 3/4" 6/-; Western FT 243 3/4" 500 Kc., 5/-.

AMATEUR BANDS.—3500/3800 Kc. 3/4" pin spacing, 15/-, any spot freq.; 7000/7300 Kc. 3/4" or 3/8" pin spacing any spot freq., 12/6. For 144 Mc.—6000/6083 Kc., 12/6; 8000/8110 Kc., 15/- any spot freq. For 28 Mc.—7000/7500 Kc. 12/6. For 21 Mc.—5250/5350, 12/6. The entire range Ex-U.S. Signals, by Bliley, Valpey, R.C.A. and other leading U.S. manufacturers. A complete range for commercial users, available on request, also a complete range for model control band for use with tripler stage, 8987/9093 Kc. at 15/-, any spot freq.

B.C. 454.—Complete with dynamometer, brand new and boxed, at 50/- carriage paid.

POWER SUPPLY UNIT.—Type 247. Input 230v. 50c. Output 500v. 300 Mills 6.3v. 3 amp. in grey crackle steel cases, 11" x 9" x 9", £3 19s. 6d.

MODULATION TRANSFORMERS.—R.C.A. PP 805s. to PP 813s., 60/- carriage paid.

THERMADOR.—400 Watt Pri. 6,700 ohms. C.T.-Sec. 4,500, 5,000 or 5,500 ohms., 7" x 6" x 5", Porcelain Standoffs, and completely screened, at 50/-, Woden UM1, 54/-; UM2, 72/6; UM3, 90/-; UM4, 215/-.

PLATE TRANSFORMERS.—Thermador, Primary 210/230v. 50 cy. Sec. 2280/1725/1420/0/1420/1725/2280 at 800 Mills. Porcelain Standoffs, Sec. test volts 6,000. In original sealed crates, nett weight 150lb. £7 10s. Od. carriage paid.

R.C.A.—230v. primary. Output 2000/1500/0/1500/2000 at 800 Mills £4 10s.

HALLICRAFTER.—Switched primary 110/230v. S20.R. replacement, 30/-

THERMADOR.—Output transformer. Primary 5,000 ohm. plate to plates load. Secondary 5, 7 1/2 or 15 ohm. and 500 ohm. line, plus winding for 10 per cent. inverse feed-back, 20/-.

R.C.A.—Filament trans. 230v. primary. 10v. Ct Twice for a pair of 805's or 813s at 25/-; ditto Thermador 230v. primary. Output 10v. C.T. 10 amp. plus 10v. C.T. 8 amp. at 30/-

DRIVER TRANSFORMERS.—R.C.A. PP 6L6s to 805s. to TZ40s, 25/-; ditto Thermador 500 ohm. line to split secondary 805 grids 1 to 2.7, 20/-.

THERMADOR.—10 Hy. at 225 Mills, 20/-; R.C.A. Swinging 5/15Hy. at 450 Mills. Weight 30lb. carriage paid, 20/-; Thordarson 8 Hy. at 80 Mills max. cur. 150 Mills, 6/-; Parmeko 8 Hy. 50 Mills, 3/6.

MICA CONDENSERS.—350v. to 1,000v. approx. 12 assorted values at 10/- per 100.

MICA BI-PASS.—2500v. wkg. most values, 12/- doz.; ditto 5000v. wkg. 2/- each; ditto .002 8000v. wkg., 5/- each.

R.C.A.—Ceramic transmitting switches, 5 bank, 9-way each bank, 10 1/2" overall, 5" ceramic wafers, ceramic construction throughout with 1/2" ceramic spindle. Long shaft for 1/2" knob. Heavy silver-plated positive contacts for up to 2 Kw. of R.F. The last word in final tank switching. R.C.A. Part. No. 429128-1. Brand new and boxed. Will switch completely anything up to 9 banks, including link and centre tap. Another 35J special record breaking price 12/6. As above single bank 9-way, 7/- As above 5-bank 2-position, 8/- Space 5" wafers available for all above.

CERAMIC SWITCHES.—Single bank 4 position, 2 1/2" x 1 1/2" ceramic wafer, 2/-.

CERAMIC SWITCHES.—Single bank, 11 wat, 3/-, R.C.A. H.F. CHOKES.—5-section Pie wound 2 Kw., 5/-.

CORNEL-DUBILIER.—Tubular 20 mfd. 25v., 10/- doz. T.C.C.—4 mfd. 2000v. wkg. 5" x 5" x 3", 5/-, 48/- doz; ditto 4 mfd. plus 2 mfd. 2000v. wkg. 9" x 5" x 3", 7/6, 72/- per doz.; ditto 10 mfd. 1000v. wkg., 4 1/2" x 5" x 4, 5/-, 48/- per doz.; ditto 1 mfd., 2500v. wkg., 3/6.

MALLORY.—Metal can round, 2000 mfd. or 1500 mfd. 15v. wkg. at 1/3 each, 12/- doz.

SPRAGUE.—Bathtub 25v. 25mfd., 1/-, 10/- doz.

KELLOGG.—4+4+4+2+1 mfd. 650v. wkg. Ex-U.S. Navy. In brown crackle metal case, 7" x 5" x 5" with Dzus lid. If desired the condenser and terminal strip is detachable from the case leaving perfect instrument case or similar. One of the best lines we have offered at 7/6 each 72/- per doz.

VALVE HOLDERS.—All ceramic. Octal 1/-, 10/- doz. 807 1/3, 12/- doz. British 7-pin, 5/- per doz.; British 5-pin, 1/-, 10/- doz.; Johnson 4-pin UX lock-in, 4/-; 813, 6/-; UX Jumbo lock-in, 6/-.

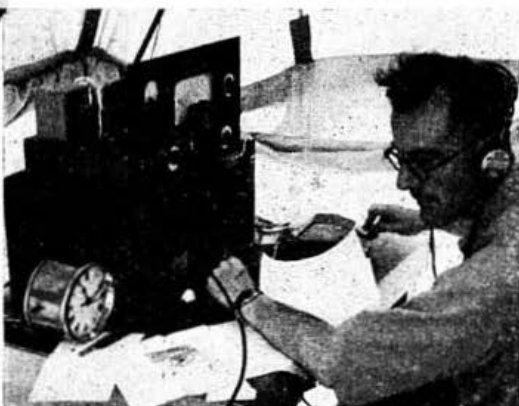
JOHNSON.—Continuously variable Ant. loading unit or tank coil. 8 turns on 3" diam. ceramic former, with 5" x 2" ceramic end plates. Standard 1/2" shaft, adjustable to zero, 500 watts R.F. Suitable for 10 and 20. Another unrepeatable 35J special at 7/6 each. **CLARISTAT.**—10K plus 10k dual pot 12 watt, 2/6 each, 24/- doz.

VOLUME CONTROLS.—Dozen assorted long spindle, brand new U.S.A., 12/-; ditto short spindle, 1 doz., 6/-.

SUNBEAMS AND SUPERHETS

JUNE 3-4, 1950 . . . glorious weather . . . activity an all-time record . . . portable operation raised to the level of a fine art . . . high scoring on the lower frequencies . . . few serious breakdowns . . . tents and primus stoves . . . the buzz of vibrators, converters and petrol electric sets . . . all adding up to yet another highly successful R.S.G.B. National Field Day. Now while we wait for the final results — and the Contest Committee's mammoth task of sorting and checking the logs is one that cannot be rushed—there is time to record brief fragments of this year's sun-baked N.F.D.

Activity in this—the eleventh—event reached a new high peak with over 125 Groups submitting entries, an increase of 20 on the record 1949 figures. More than two hundred portable stations: a total which must have seemed almost incredible to old-timers—including G6UT (who took part again this year as a "private portable") and others who were responsible for the introduction of Field Day into the amateur calendar. In the first event in 1933 there were 34 portable stations active in 18 districts!



W. H. Allen, G2UJ, takes time off from "Around the V.H.F.'s" to operate the Tunbridge Wells and Tonbridge Group "A" Station.

Smaller Groups, encouraged by the new rules, entered the fray with zest and have little reason to fear the publication of results. In North Buckinghamshire, three operators—G2DTD, 3AZ and 3EEB—kept two stations continuously on the air; a vivid contrast to some of the larger stations where operators and helpers worked to an elaborate rota of duties. For some the occasion was essentially a social one; for others the emphasis was on point scoring.

But though it was generally recognised that the scoring was reasonably fair to all, experience and planning are still all-important. Year after year certain Groups consistently turn in excellent scores. The three "C's"—Cambridge, Cheltenham and Coventry—are seldom far down the list, and this year all were in fine form. But then so was East Molesey, anxious to become the first Group to retain the trophy for two years running. Again, as usual, there are a number of "dark horses" who are well in the running—if not for the Shield itself then at least for leading "A" or "B" positions. Burnley, Ealing, Slough and Southampton are all likely to be high in the list, whilst Scotland may prove to have some surprises in store for those south of the border. Record scores for the

"A" station are claimed by several Groups and some of the "B" scores are but little down on last year—in spite of aerial restrictions.

Good DX on 7 Mc/s.

Conditions, combined with the limitations on aerial systems, tended to reduce 14 Mc/s. activity; most stations finding that points came more easily on 7 Mc/s. The sunspot cycle is now well on the decline and DX on the lower band was more plentiful this year: KP4, VE1, W1, 2, 3 and 4 were all worked on 7 Mc/s. ZB1FK/P—a welcome 12 points—contacted 36 British portables on 7 Mc/s., compared with 18 on 14 Mc/s. This station, incidentally, was working under N.F.D. rules with an input of 4.7 watts. On 14 Mc/s. some surprisingly good DX was raised with simple aeriels. MP4KW/P appears in a number of logs and other interesting prefixes noted—in a by no means complete survey of the entries—include KV4, YS1, PZ1, UJ8 and VQ4, not to mention VK2, 3, 5, ZL2, 3 and ZS6. All continents were raised—excellent going for 5 watts and single-wire aeriels! The West Cornwall Group was one of the most successful DX-chasers, with a bag which included UJ8AF, VQ4KRL, 4X4BX and MP4KW/P: their aerial was a 67 ft. top tapped at 22 ft. and fed with 300-ohm ribbon feeder.

As usual the Swiss stations—competing in their own U.S.K.A. Field Day—formed the bulk of the overseas portables, with their signals pounding in on one band or another throughout the 24 hours. Dutch portables were also prominent although some confusion appears to have been caused by their use of X, to indicate portable operation, in front of the normal PA prefix.

Popularity of HRO

It is always interesting on these occasions to note the trends in equipment. The V.F.O. is now almost a *sine qua non* of participation, with many notes better than pre-war "crystal" standard—though there were still a few notable exceptions. But even more complete was the elimination of the home-built receiver. An examination of the entries of 100 stations reveals the following information: 46 HRO's; 13 AR88's; 7 Eddystone 640's; 6 BC342's; 6 BC348's; 5 BC312's and 17 miscellaneous commercial or service receivers (not more than 2 of any one particular type). The HRO thus emerges an easy winner in the popularity stakes with—at least in this section of the entries—the home-built receiver a non-starter.

Faults of a serious nature were few and far between—though just after 0500 on the Sunday morning the log of G2HGR/P bears the unhappy entry "TX burnt out beyond repair". . . dashing the hopes of the Bolton Group for another year. Fireworks of a more orthodox type were in evidence at the Barnes and Richmond station—the site being next door to the stage and film carnival!

So another Field Day is added to our memory of enjoyable Amateur Radio occasions. Enjoyable not only to all those members—licensed, B.R.S. and Junior Associate—who took part but also to those who followed the progress of the event in their own homes. And whatever the results this year, you can always look forward to 1951 and dream of the day when your own Group will capture that elusive N.F.D. Shield. **J.P.H.**

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VARIABLE WIRE WOUND RESISTANCES.—150 ohms. 2 amp. double, 30/-; 4.6 chms. 16 amp., double, 35/-; 20 ohms. 2.5 amps., single, 15/-; 5 chms. 10 amp., Zenith, 21/-; 300 chms. 1/2 amp., 15/-; 1.2 chms. 15 amps., 7/6; 60 chms. 2.8 amps., 27/6; carriage extra.

CURRENT TRANSFORMERS.—400 to 5 amp., Sangamo Weston S2 50 cy. 15 Va. system voltage 700 B.S.L., 38/-; 1,200/600 to 5 amps. dual range Crompton 15 Va Class C 35/-.

FREQUENCY METERS.—Crompton 1/c. flush panel 40/60 cy. 230 volts. £5/10/0.

VARIACS.—200C input 115 v. output 130 v. Rating 600 Va. £5/10/0.

DYNAMOS.—12 volt 50 amp. D.C., shunt wound, ball bearing, new surplus stock, 2,500 r.p.m., £6/10/0; 12 volt 10 amp. C.A.V. 12 volt 10 amp. 1,425 r.p.m., shunt, 40/-; carriage on any dynamo 5/-.

TRANSFORMERS.—Double wound Foster 230 volts input 50 volts 2 amps. 100 watts output, 15/-; carriage 2/-.

Power Transformer 220 volts 50 cy. input 53 volts 15 amps. 30/60 volts 1 amp. 6 volts 3 amps., £4; carriage 5/-.

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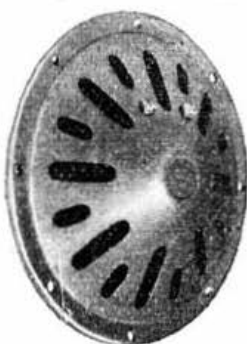
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QUA

THE story behind the call **G3GYL**—now active on 3.5 Mc/s. C.W.—should be an encouragement to many. The call belongs to charming Miss **Nina Barrett** who, less than twelve months after first becoming actively interested in transmitting, has obtained her licence—in spite of being blind. In June, 1949, her knowledge of Amateur Radio was confined to what she had heard over the air, and a smattering of Morse learnt in the Girl Guides. But, thanks to the wholehearted efforts of local Hampstead members, including **G2BWN**, **2CQJ**, **3CGB**, **3COL** and **3DCU**, and her own indomitable spirit, Miss Barrett passed the Radio Amateurs' Examination on May 10 and subsequently passed the Morse test. She took—aurally—exactly the same examination paper as other candidates. At present **G3GYL** is using a single 807 crystal oscillator with 7 watts input, so give her a break by keeping the channel clear!

The call sign of another newly-licensed sightless amateur—given last month as **GM3GJJ**—should have been **GM3GNX** (**Leslie Fraser** of Glasgow). **GNX** is rapidly becoming independent of outside assistance; he carries out his own soldering and plans eventually to build all his gear.

The **Clapp** oscillator must be familiar to almost all British amateurs; but how many members know that a similar circuit was being used by the B.B.C. several years before J. K. Clapp's article in *Proc. I.R.E.* focussed world-wide attention on this high-stability oscillator? In the April, 1950, issue of *Wireless Engineer*, **G. G. Gouret** of the B.B.C. Engineering Research Department says "The circuit of this oscillator was conceived and developed independently in this country by the author some nine years ago . . . and has been used almost exclusively in B.B.C. transmitter equipment throughout the country." The moral seems to be: it is not always sufficient to be first in developing ideas—you must publish the details!

In a closely contested election **George W. Bailey**, **W2KH** has been re-elected President of the A.R.R.L. for a further term of two years. The League is launching a drive to enrol 10,000 more full members. Its Board of Directors has voted 10,000 dollars (about £3,500) to provide representation at the Extraordinary Administrative Radio Conference in The Hague, this September.

Why is **New Zealand** so Amateur Radio conscious? With 1,800,000 inhabitants, there are approximately 1,800 licensed amateurs; a higher proportion than even in the United States, and almost six times as high as in this country. One reason is the sensible examination system. Candidates are given 60 questions to answer in three hours—but ready-made alternative solutions are provided for many of them, so that it is only

necessary to indicate which is the correct answer. The quiz is skilfully designed to seek out accurately the candidate's knowledge of radio theory and practice, irrespective of "literary" abilities or the luck of having swotted-up the "right" questions.

Two useful addresses for your notebook. One of London's most complete collections of scientific books (over 332,000 volumes) is the **Patent Office Library**, 25 Southampton Buildings (near Chancery Lane Underground Station), High Holborn; open from 10 a.m. to 6 p.m. Mondays to Fridays, and 10 a.m. to 5 p.m. on Saturdays. Information on current American valves can be obtained from **R.C.A. Photophone Ltd.**, 36 Woodstock Grove, London, W.12 (Telephone: SHEpherds Bush 1200).

W9BRD, DX Editor of *QST*, wonders what has become of the old lullaby rhythm or "DX Swing"—that unique trade mark of the veteran DX-chaser in the thirties. Nowadays the custom is to call and work stations at the far ends of the world at the same speed as a local station. Yet another sign of the times is the full page advertisement in the June issue of *QST* by one of America's best known amateur supply stores featuring the British-built "**Commander**" receiver.

The Voice of America **Radio Amateurs' Programmes** on Sundays at 1915 G.M.T. are now broadcast direct from the U.S.A. on 15270 kc/s., 17780 kc/s. and 21500 kc/s.; and are relayed by the B.B.C. on 7200 kc/s., 9700 kc/s. and 12095 kc/s. The relays by Munich have been discontinued. The U.S.S.R. short-wave service includes some 75 100 kW. channels from Moscow and over 25 medium-power channels elsewhere.

John B. Rimmer, **GM3AKK**, telecommunications officer of Outram Press, Glasgow, helped to establish newspaper history when the Aquila Airways flying boat "Hudson" made her proving trip from Southampton to Greenock. With the help of Pye and Muirhead-Belin equipment, news stories and photos were transmitted direct to Glasgow during the flight. At a height of 5,000 ft. two-way contact was made on 172 Mc/s. at distances up to 120 miles.

Swiss National Mountain Day—in which stations must be established at heights of at least 3,280 feet, the last 1,000 feet being covered on foot carrying all equipment (total weight less than 13.2 lb.)—was held this year during the morning of July 23 (3.5 Mc/s.).

Special frequencies were made available to New Zealand amateurs who provided radio links at the British Empire Games . . . some 600 merchant ships—including 200 foreign-registered vessels—have been fitted with British radar equipment . . . **VK2** amateurs helped to provide emergency communications during the recent Murrumbidgee river floods . . . the G.P.O. has prepared photographs showing interference patterns produced on television screens by F.M. transmitters, diathermy equipment, motor ignition and Gee radar stations . . . the B.B.C. now regularly televises a film—prepared with the co-operation of the **Radio Industry Council**—showing how easy it is to fit a motor-car ignition interference suppressor . . . for several years before the introduction of the SOS call the signal CQD was used by ships in distress . . . a network of 18 V.H.F. F.M. broadcasting stations in Western Germany uses frequencies between 87.7 Mc/s. and 96.5 Mc/s. with powers of from 100 watts to 10 kW. . . frequencies of high-fidelity F.M. broadcasting stations at Copenhagen are 90.7 Mc/s. and 96.5 Mc/s. . . at least eight American amateurs are radiating TV signals on 420 Mc/s. . . licences are now being issued to German nationals in the French zone of Germany.



This international group of American, British, Danish and German amateurs visited a 40 cm. radio relay station during the recent Hamfest.

Service, Quality and Complete Satisfaction

UNCONDITIONALLY GUARANTEED

AN/CRW-2 RADIO RECEIVING SET.

Six-valve amplitude modulated receiver. Operated from external 24 V. supply, has two screened plug-in coils and contains a large number of components, including two 25 μ F. 450 V. wkg. condensers, 28 V. dynamotor. Valves fitted 3 6SL7, 1 6SN7, 1 6SC7, 1 6J5. Size 9" x 8" x 4 1/2". Valves alone worth more than price. Brand New and Unused. Price 25/-. carr. and packing, 2/6. A small quantity only available.

12 VOLT CAR RADIO. Comprises a type 26/ARCS Ex-Govt. Command Receiver modified to tune 200-500 metres. Receiver has 6 valves and is supplied complete with 5" loud speaker. Dimensions 11" long, 4 1/2" wide, 5 1/2" deep. Ignition suppressor included. No aerial supplied. Any standard pattern suitable. Price £5 10s. carr. paid.

TELEVISION PRE-AMPLIFIER.

This ex-Govt. 1-valve pre-amp. is just what you want to make an amazing improvement in vision and sound in fringe areas. Fitted with EF50 valve. Length 4", width 3 1/2",



depth 1 3/4". Overall depth to top of valve 4 1/2". Power required 6.3 V. L.T., 200/275 V. H.T. 3 connections only to power supply. Ideal for "The Viewmaster," "The Inexpensive Television Set," "Electronic Engineering Televisor," etc. Tested and Guaranteed before despatch. Type A for London, Type B for Birmingham. Price while they last, 15/-. post 1/-.

TYPE 87 POWER UNIT. Input 12 V. Output 265 V. 65 mA., 6.5 V. 2.5 A. Incorporates beautiful Rotary Generator in neat case 8 1/2" long, 6 1/2" high, 4 1/2" wide, 5/- each, post 1/4.

PLUG ON POWER UNIT for Command Receiver BC453/4/5 or ARCS series. No alterations to set wiring. Simply plug on. Fitted 6X5 rectifier. (Not Surplus). Beautifully made, 50/-, carr. paid.

RECEIVER TYPE 25. Covers 4.3-6.7 Mc/s., and makes an ideal basis for an all-wave receiver as per *Practical Wireless*, August issue. Complete with valves EF36 (2), EF39 (2), EK32 and EBC33. Brand New. Only 21/-. carr. 1/4.

TU6B TUNING UNITS. Equal to brand new (less outer case), 3-4.5 Mc/s., 7/6, post paid.

B306 AERIAL TUNING UNITS. Aerial Variometer 5 - way Ceramic 3 - pole switch. Porcelain lead through insulators, precision slow motion dial, 3 6,000 V. 80 μ F. condenser, 10/- each, carr. 1/4.

TRANSMITTING VALVES. 813 G.E.C., of America. Brand New in maker's cartons. Unique bargain, £1 7s. 6d., post paid.



RADIO SET SCR 291 A

Comprising:

Federal U.S.A. 110 V. 50/60 cycles Communication Receiver, BC1147A. 13 valves, comprising 6SK7 (4), 6SH7, 6SA7, 6J5, 6H6, 6SJ7, 6SQ7, 6K6, or 6V6, 5U4C, VR150. 4 wavebands 1.5-3.1 Mc/s., 3.1-6.6 Mc/s., 6.6-14 Mc/s. 14-30 Mc/s. I.F. frequency 455 kc/s. Front panel 19" x 14", rack mounted.

CONTROLS. — Waveband switch, matching, tuning, A.F. gain, I.F. selectivity (band width), BFO, BFO On/Off, sensitivity, power on/off. AVC - manual. Built-in loud speaker. Receiver section is entirely self-powered. A supersensitive receiver of the highest class. **Auxiliary Power Pack Control, Panel PN31A.** 110 V. 50/60 cycles. 4 valves and stabiliser, 2X2, 5U4C, 6L6, 6AC7, VR150. 6 Potmeters, 6 toggle switches, 3 indicator lights. All circuits fully fused, 0-50 mA meter. Unit self-contained. Rack mounted. Size 19" x 10 1/2". Ideal for operating your transmitter. **Magneto Operated Telephone Circuit PN32A.** Handset and mag-handle on front panel. Size 19" x 5 1/2". (The XYL can call you for meals with the phone.) Whole equipment in magnificent cabinet type rack 32" high, 20" deep, 22" wide, 218-page instruction book included. Brand new, unused. In original unopened packing. Securely packed in wooden container with fall-away front and rear, making set very quickly operative. Make your Ham Shack a real radio station with one of these magnificent equipments.

(ORIGINAL COST APPROX. £250. 17 only available. Our price £30 each, carr. paid.)

TYPE R-31 APS-2E. A magnificent instrument. Absolutely brand new and unused in original manufacturer's packing cases. Fitted two Cathode Ray Tubes. One type 5FP7 5" diameter Magnetic deflection and one 2AP1 2" electrostatic. Valves fitted comprise 8 6L6G, 13 6SN7, 1 2X2, 2 6H6, 2 6X5, 8 6AC7, 3 VR105, etc. Has Blower motor cooling fan, 3 panel meters and a fabulous quantity of components. Input 115 V. 400 c.

Size 26" x 19" x 12" housed in a fine black crackle case. 40 valves approx. Original cost approx. £150 each. Few only £15 each, carr. paid.

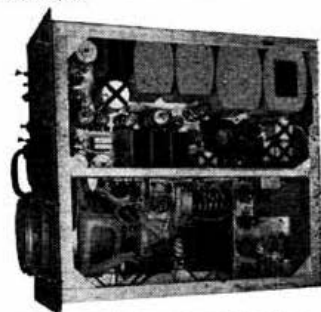
CONDENSERS. Brand New Waxed Tubular, 50 for 10/- (25 .1 μ F. 1,000 V., 25 .25 μ F. 500 V.) also .1 μ F. 600 V. Oil filled, 10/- doz., post paid. A really outstanding offer.

EF50 CERAMIC VALVEHOLDERS, 5/- dozen, post paid.

CANADIAN No. 58 MARK 1 TRANS-RECEIVER. 33-50 metres, 16 section rod aerial. Operates from 180 V. dry battery which is included, together with an extra one as spare. Range 5-10 miles. Greatly exceed with wire aerial. 5 valves in receiver, 3 in transmitter. Size 12" x 7" x 5". Weight 18lb. Supplied with 2 sets headphones and microphones. Brand New. Unused. 10 Gns. carr. paid.



1155 A.C. POWER PACK AND OUTPUT STAGE. As per *Wireless World* specification. Brand new in neat crackle case 12" x 8" x 5". Handle and P.V.C. feet. Complete with L.S. Just plug into 1155 and set is all A.C. operated. Special Value, £5 19s. 6d., carr. 3/6.



RADAR INDICATORS, TYPE VE. Grey enamel case. Length 24" x depth 23" x wide 11". Contains 16 valves, 7 6SN7, 3 807, 2 VR150, 2X2, 5U4C, 6AG7, 6SL7. Oil-filled Condensers 10 μ F. 600 V. (3), 6 μ F. (2), 1 5,000 V. (2), Potmeters (16), small Electric Motors (2), Westinghouse Transformer Input 115 V. 60c. Output 3,890 V., .0023 A. Another ditto Output 6.3 V., 10 A., 6.3 V. 0.6 A., 5VCT. 3 A., 850 V. 0.142 A. Westinghouse Filter Chokes (2) 10 H., 2 A. 77 chms., also a very large quantity of precision resistors and condensers. 7" C.R. tube mounting and focussing coils (no tube). Double-deck chassis which slides in and out of outer case. Brand New and Unused. Ideal for conversion to transmitter, or T.V. An outstanding bargain, £12 10s., carr. paid.

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HEADQUARTERS CALLING

COUNCIL, 1950

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Executive Vice-President: F. Charman, B.E.M., G6CJ.

Hon. Treasurer: A. J. H. Watson, F.S.A.A., G2YD.

Hon. Secretary: J. W. Mathews, G6LL.

Hon. Editor: Arthur O. Milne, G2MI.

Immediate Past President: V. M. Desmond, G5VM.

Members: W. H. Allen, M.B.E., G2UJ, A. P. G. Amos, G3AGM, L. Cooper, G5LC, D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E., G5CD, W. N. Craig, B.Sc., G6JJ, C. H. L. Edwards, A.M.I.E.E., G8TL, P. A. Thorogood, G4KD.

General Secretary: John Clarricoats, G6CL.

May Council Meeting

Resume of the Minutes of the Proceedings at the Meeting of the Council of the Inc. Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, May 9, 1950, at 6 p.m.

Present.—The President (Mr. W. A. Scarr, in the Chair), Messrs. W. H. Allen, A. P. G. Amos, F. Charman, L. Cooper, D. N. Corfield, W. N. Craig, V. M. Desmond, C. H. L. Edwards, J. W. Mathews, A. O. Milne, P. A. Thorogood and John Clarricoats (General Secretary).

Apology.—An apology for absence was submitted on behalf of Mr. A. J. H. Watson.

Finance.

Resolved to accept and adopt the Balance Sheet for the quarter ended March 31, 1950, and Cash Accounts for the months ended March and April, 1950, as submitted by the Hon. Treasurer.

Investments.

Resolved to invest a minimum of £2,000 in 3% Saving Bonds (August, 1955/1965).

It was reported that as at March 31, 1950, the price of the Bonds was 98½; the yield would be £3.1.1 and the redemption yield £3.2.11.

Membership.

Resolved—

- To elect 66 Corporate Members, 17 Associates and 6 Junior Associates. (Total elected 89.)
- To grant Corporate Membership to 3 Associates who had applied for transfer.
- To grant Life Membership to Mr. H. E. Bennett, G8PF.

Applications for Affiliation.

Resolved to grant affiliation to No. 32 Maintenance (R.A.F.) Amateur Radio Society and to the Leicester Ham Radio Society.

Representation.

Resolved to appoint to the offices recommended by the respective Regional Representatives, the members whose names had been listed by the Secretary.

Festival of Britain (South Bank Exhibition).

A letter was read from Mr. H. E. Smith, Editor of the *Wireless World*, regretting that Amateur Radio would not be represented at the Festival. Mr. Smith expressed the view that the employment of paid operators would not be contrary to the best interests of the Amateur Radio movement, and offered to ask the publishers of *Wireless World* to make a substantial grant towards expenses, if, in fact, the question of cost was a barrier to the Society's participation in the Festival.

Resolved, after considerable discussion, to decline with thanks the offer made by Mr. Smith and to express to him the Society's appreciation and explain that financial considerations were only of secondary importance when the Council made its decision not to proceed further with the proposal that an Amateur Radio station be operated from the South Bank Exhibition.

Consideration was given to a letter from Mr. Goudime regretting the decision of the Council not to participate in the Exhibition and suggesting that members should have been asked to volunteer for duty.

Resolved to thank Mr. Goudime and to explain to him that the Council does not feel justified in reopening its negotiations with the South Bank Exhibition authorities.

It was reported that the Society may be invited to participate actively in the Festival of Britain Exhibition which is to visit Manchester, Birmingham, Nottingham and Leeds.

R.S.G.B. Bulletin—Printing.

Resolved to accept an estimate submitted by the South London Press, Ltd., for printing Volume 26 of the BULLETIN. It was reported that the estimate submitted by the South

London Press, Ltd., was considerably lower than the estimate submitted by Sir Joseph Causton & Sons, Ltd., who had printed the last eleven volumes of the BULLETIN.

Bulletin—Front Cover.

It was reported that a new style of front cover layout designed to help advertisers would be introduced as from the June, 1950, issue.

I.A.R.U. Congress.

It was reported that Mr. Watson would be unable to attend the Congress.

Resolved to invite Mr. Gerald Marcuse, G2NM (Past President, R.S.G.B.), and Founder Vice-President, I.A.R.U.), to attend the Congress as a Member of the R.S.G.B. Delegation.

B.E.R.U. and Empire Link Stations.

Consideration was given to a suggestion put forward by Mr. D. Mitchell, ZL1MP, that the B.E.R.U. and its associated Empire Link Station network should be revived.

During the subsequent discussion the view was expressed that the B.E.R.U. had served its purpose well in the pre-war years, but its usefulness had now ended for all practical purposes.

It was agreed to communicate the views of the Council to Mr. Mitchell.

Mr. D. Davies, G8QW.

It was reported that Mr. J. P. Hawker (Assistant to the General Secretary) attended the hearing of the appeal of Mr. D. Davies, of Totton, Southampton, to the Ministry of Town and Country Planning, against the decision of the Hants County Council refusing him permission to keep in position a structure 58 feet high for supporting his rotary beam aerial.

Resolved to place on record the appreciations of the Council to Mr. Hawker for the informative report which he had prepared.

Mr. C. H. Young, G2AK.

It was reported that the appeal by Mr. C. H. Young to the Ministry of Town and Country Planning against the decision of the Birmingham City Council refusing him permission to erect a wooden tower for his rotary beam aerial had been rejected on the ground that the proposed development would be inconsistent with the proper planning of the area.

Technical Literature for the Blind.

Mr. Edwards suggested that the Society should offer a donation to the National Institute for the Blind for the specific purpose of providing additional Braille copies of the *Amateur Radio Handbook*.

The Secretary reported that he had recently had discussions with representatives of the National Institute for the Blind in regard to their Talking Books scheme. There are between 2,000 and 3,000 blind people in the country who use the Talking Book. The machines are specially made for the Institute and records are circulated from London. Many of the blind are old and frail and often there is no one at home with engineering or electrical knowledge. Instruments are frequently returned to the Institute for the most absurd reasons. The Institute had asked whether the Society could help by inviting its members to give voluntary advice to blind people who may experience trouble after obtaining Talking Book apparatus.

Following the discussions, Sir Ian Fraser (a Past President of the Society and Chairman of St. Dunstan's) had addressed a letter to the Secretary confirming the information previously given and enquiring whether the Council would agree in principle that the work could be undertaken by members. Sir Ian made it clear that members would not be expected to carry out ordinary repairs which would be undertaken by the trade.

The Secretary explained that with the aid of the Talking Book system the *Amateur Radio Handbook* could be offered to blind people in the form of a collection of gramophone records. He felt that this method of conveying intelligence to blind persons interested in Amateur Radio would be even more successful than the Braille method, especially as only a small percentage of blind people are good Braille readers.

The Secretary was instructed to inform Sir Ian Fraser that the Council agrees in principle to the suggestions outlined in his letter and that the Society would be glad to contribute to the cost of producing a Talking Book version of the *Amateur Radio Handbook* if such seems practicable.

R.S.G.B. Fourth Annual Amateur Radio Exhibition.

Resolved—

- That the hire charges for stands be the same as for the 1949 Exhibition.
- That exhibitors be permitted to demonstrate apparatus for three half-hour periods per day.
- To invite Mr. Hugh Pocock to open the Exhibition on November 22.
- To arrange a complimentary luncheon to trade representatives and distinguished guests on the lines of past years.

"Milford Viscount."

The Secretary reported that on May 1 the *Daily Express* commented editorially upon the transmissions which were alleged to have come from the overdue trawler "Milford Viscount". The leader continued with the words, "if some radio amateur deliberately faked a distress call and added to the agony of thirteen families he is unfit to walk with

Radio Servicing

Theory and Practice

By ABRAHAM MARCUS

Radio Servicing is a practical job, but a good knowledge of radio theory is essential for the man who wishes to know why as well as how. This book explains the theory of the radio receiver — diagrams, pictures and verbal descriptions replace as far as possible mathematical formulae. The practical side is also fully covered and the book points to short-cuts in the diagnosis of faults and the most effective means of repairing them. Each chapter ends with an account of servicing procedures and techniques. A four page leaflet giving further details and a list of contents can be obtained without charge from the publishers.

775 pages 450 illustrations 35s. net

For the enthusiast who wants a good, clear account of elementary radio theory we can recommend **ELEMENTS OF RADIO** by ABRAHAM and WILLIAM MARCUS Vol. I (12s. 6d.) deals with the radio receiver.

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40 MUSEUM STREET, W.C.1.

SILVER JUBILEE

Congratulations to the R.S.G.B. who, having completed the 25th year of publication of the Bulletin, celebrate its Silver Jubilee.

G2ACC also celebrates his Silver Jubilee with 25 years' service in the Radio Industry. A quarter of a century's experience is behind every transaction, and is available to amateurs, old and new alike.

To enable our clients to have full details of the many and varied items of amateur equipment which we stock and supply, we have produced a comprehensive 60-page illustrated catalogue which contains over 2,000 amateur lines. This can be forwarded to you for 9d. post free.

- ★ **COMMUNICATION RECEIVERS.** Eddystone "750" Double Superhet £49/10/0; "680" £89/5/0; Radiovision "Commander" Double Superhet £52, or £13 deposit and 18 monthly payments of £2/9/10. This receiver is claimed by a number of U.S.A. amateurs as the "biggest dollars' worth of receiver they'd ever seen!" Radiovision "Hambander" £25/10/0, or £6/7/6 deposit and 12 monthly instalments of £1/15/3.
- ★ **LABGEAR.** Wide Band Couplers, 1.7, 3.5, 7, 14, 21 and 28 Mcs. 17/6 each.
- ★ **EDDYSTONE.** 145 Mcs. Beam Aerial £6/5/0; 145 Mcs. Guide 1/6; Semi-automatic morse key 77/6; Modulation Level Indicator £8/5/0; Catalogue 6d.
- ★ **TELCON.** New tubular low-loss 300 ohm cable K35 1/3 yard; 300 ohm ribbon cable 9d. per yard.
- ★ **WODEN.** Modulation Transformers: UM1 60w RF, 54/-; UM2 120w. RF, 72/6; UM3 250w. RF, 90/-; UM4 500w. RF, 215/-; Mains Transformers from 250-0-250v. to 2,000-0-2,000v. Chokes from 60mA to 500mA.

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POWER TRANSFORMERS. 620/550/375/0 375/550/620 c/s. at 200 mA., plus 250 mA. at the 375 V. taps. Two separate windings for rectifiers of 5 V. at 3 A each. Primary 250 V. 50 c/s. Rated at 278 watts (this is a very conservative rating and could be exceeded by at least 50 per cent. for amateur use). Weight 24 lbs. Made by Farmeko and are brand new, but some may be a little store soiled. Our price 50/-. Carriage paid.

MODULATION TRANSFORMERS. 360 watts. Prim. 5500, 5000, 4500, ct. Sec. 1 3550 at 450 mA. Sec. 2 6700 ohms 12 watts. Ideal for Plate and Screen modulation. Price only 27/6. Carriage paid.

HEAVY DUTY L.F. CHOKES. FULLY POTTED.
30 Hy. 100 mA. 150 ohms (Weight 14 lbs.). Price 13/6.
20 Hy. 126 mA. 100 ohms (Weight 14 lbs.). Price 15/6.
30 Hy. 150 mA. 150 ohms (Weight 18 lbs.). Price 17/6.
(For Amateur use, above ratings could be doubled). All transformers are carriage paid except to Elre for which we must ask for 5/- extra.

MICROPHONES. Brand new American single button carbon breast assembly. Ribbed aluminium diaphragm, bakelite case. Complete with three position switch. Speech quality of this Mike is equal to a moving coil type. Price 5/-.
Extra 3 position switch with 10 ft. length of three core flexible T.R.S. cable for above. Price 1/3.

Special Throat Microphones. Two midget microphones with strap. Price 1/6.
Moving Coil Hand Microphone with switch. Price 3/11.
Moving Coil Headphones. Price 4/11.
Above two items together. Price 6/-.
VIBRATOR PACKS. 6 V. input, output 180 V. 40 mA., fully smoothed, price 19/6, plus postage 1/6. 12 V.

Carriage paid on all orders over £1 except where stated. Please include small amount for orders under £1.

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input, output 300 V. 100 mA., fully smoothed, 19/6, plus postage 1/6. All packs are tested and sent out in working order.

SPECIAL FOR AR88 USERS. Matching Speakers, 2.5 ohms, black crackle case, £3 15s. Spare Crystals for "D" model only. 455 kc/s., 15/-. Sealed cartons of spare valves (14), £5.

TWIN FEEDER. 80 ohms, 5d. per yd. Twin Ribbon Feeder, 300 ohms (heavy duty), 5d. per yd. Co-ax. Cable, 1" dia., 70 ohms, 6d. per yd.
Postage on above feeder and cable, 1/6, any length.

SPECIAL METER OFFER.
500 μ A. Scaled 0-500 2" dia., 7/6 each.
500 μ A. Scaled 0-15-500, 6/3 each.

Ditto, but eq. equipment, 5/- each.
5 A. Thermo, 2" dia., 2/6 each, or 5 for 10/-.

0-5 mA., 2" dia., 5/- each.
0-100 mA. and 0-500 mA., 2 1/2", flush mounting, 7/6 each.

0-20 V., 2" dia., 5/- each.
20-0-20 A., 2" dia., 5/- each.

0-3,500 V. moving coil, 3 1/2" dia., 25/- each.
0-9 A., hot wire ammeters (by removing external shunt full scale deflection is 4 A.), 1/6 each.

Radiator Thermometers. 2" dia., movements 2.5 mA., backwards reading, ideal for "S" meters, 1/6 each.
Postage on single meters 6d., 3 or more post free.

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COILS. We carry a full range of Denco, Douglas, Wearite, Weymouth and Osborn at standard prices.

SPEAKERS. 2 1/2", 12/11; 3 1/2", 13/11; 8", 15/-; 10", £1.

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men". Immediately the attention of Headquarters was drawn to this editorial a vigorous protest in the form of a letter was prepared by the Hon. Editor and handed to a representative of the *Daily Express*.

Following publication of the editorial, letters were received from several members protesting against the innuendo contained therein that licensed amateurs were to blame for the alleged hoax.

It was reported that the *Daily Express* had not published Mr. Milne's letter, neither had any further reference been made to amateurs.

After a general discussion the Secretary was instructed to write to the appropriate Ministry and ask that a meeting be arranged between representatives of the Society and the various Government Departments concerned with safety of life at sea.

A member (Mr. C. W. Henderson) wrote to suggest that the Council should vote the sum of 100 guineas to the "Milford Viscount" Distress Fund when all hope of the trawler's return had been abandoned. Alternatively Mr. Henderson suggested that the Council should consider inaugurating a fund sponsored by the Society.

Resolved to take no action on the suggestions put forward by Mr. Henderson.

Amateur Licence.

The Post Office wrote to confirm that the Society will be given an opportunity of examining the new licence before it is printed.

Membership and Representation Committee.

It was reported that the Committee had given careful consideration to a Report prepared by the Barnet T.R. (Mr. R. Walker), in which he suggested that membership information supplied to him indirectly by Headquarters was inaccurate.

The Committee had agreed that in future every R.R. would be supplied with lists of changes of address and also the names and addresses of members who were then four months overdue. This information, coupled with the lists of New Members published in the BULLETIN, would enable representatives to maintain a more complete record of members.

The Committee had also considered matters concerning representation in the Bournemouth and Guildford-Woking areas.

Technical Committee.

It was reported that the Committee were enquiring into the cost of preparing and printing a new edition of the Amateur Radio Handbook.

The Committee had also given consideration to BULLETIN Advertising, Amateur Television and Television Interference. Steps were being taken to produce a revised edition of the booklet entitled "Transmitter Interference".

Band Checking.

Mr. Craig reported that the work of the Band Checking Group was proceeding satisfactorily and that he had accepted an offer of co-operation from *Short Wave News*.

D/F Contest.

Resolved to authorise the Contests Committee to organise a D/F Contest during the current year and to award a suitable trophy to the winner.

The meeting terminated at 9.25 p.m.

Representation

The following are additions to previous lists:

Town Representatives

Region	Town	Name, Call-sign and Address
2	Rotherham	W. Darbey, G6ZA, 1 New Houses, Fence, Woodhouse Mill, nr. Sheffield.
13	Kirkcaldy	G. K. Syme, GM3EFH, 17 Aitken Street.

Vacancies

Mr. J. Rudkin, G3CDW, and Mr. S. McKay, GM2FTN, have resigned as County and Town Representatives for Cheshire and Aberdeen respectively. Nominations for their successors should be made in the manner prescribed in the September 1949 issue of the BULLETIN and sent to reach the General Secretary by August 31, 1950.

Fourth Annual

AMATEUR RADIO EXHIBITION

Royal Hotel, Woburn Place, London

W.C.1.

NOVEMBER 22nd to 25th, 1950

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121 KINGSWAY, LONDON, W.C.2.

R.S.G.B. Slow Morse Transmissions

B.S.T.	Call	kc/s.	Town
Sundays			
09.30	G6NA	1750	Guildford
10.00	G5XB	1950	Reading
22.00	G2FXA	1900	Stockton-on-Tees
Mondays			
13.00	G3AXN	1870	Southend-on-Sea
19.00	G3NC	1825	Swindon
19.30	G3ESP	1850	Wakefield, Yorks
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G3DSR	1750	Derby
20.00	G2CLD	1775	Tunbridge Wells
21.00	G2BLN	1900	Bournemouth
21.00	G8VR	1850	London, S.E.2
21.00	G3BHS	1820	Eastleigh, Hants
22.00	G8TL	1896	Ilford
22.30	G4GA	1896	Chingford
Tuesdays			
13.00	G3AXN	1870	Southend-on-Sea
19.00	G5XB	1905	Reading
19.30	G2AVK	1850	Ossett, Yorks
20.00	G12HLT	1900	Belfast
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G2FXA	1900	Stockton-on-Tees
22.30	G6JB	1820	Salcombe, Devon
Wednesdays			
20.00	G2NY	1850	Preston
20.00	G3AFD	1783	Southampton
22.00	G6NA	1840	Guildford
22.00	G3DLC	1800	Grays, Essex
Thursdays			
18.00	G3AXN	1870	Southend-on-Sea
19.00	G3NC	1825	Swindon
19.30	G2AQN	1850	Ossett, Yorks
20.00	G3NT	1805	Northallerton
22.00	G2FXA	1900	Stockton-on-Tees
22.00	G3ARU	1990	Wanstead
22.30	G3OB	1803	Manchester
Fridays			
13.00	G3AXN	1870	Southend-on-Sea
19.00	G3BLN	1900	Bournemouth
19.30	G3DMP	1850	Wakefield, Yorks
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G3AKW	1860	Warral
20.30	G8LZ	1868	Gravesend
21.00	G3BHS	1820	Eastleigh, Hants
22.30	G6JB	1820	Salcombe, Devon
Saturdays			
10.00	G3FPS	1800	East Molesey
23.00	G3CHY	1800	Ashton-u-Lyne
23.00	G2FXA	1900	Stockton-on-Tees

Ten Minute Quiz

Answers to the questions set on page 25

1. The type of detector circuit used to receive frequency modulated signals.
2. Your answer could have included: harmonic, frequency, phase, scale, transient, cross-modulation, spurious combination tones, differential distortion.
3. The U.S.S.R. comprises 16 republics each with its own prefix. However, as the prefix UA is used in both Europe and Asia (UA9 and UA0) the possible score for DXCC purposes is 17.
4. R is nearly equal to eight.
5. The call-sign of the experimental standard frequency station at Rugby (for details see February, 1950, issue).
6. To provide screening against stray magnetic fields—generally in cylindrical form round the necks of cathode ray tubes.
7. Usually an aqueous solution of boric acid.
8. In valves: that produced in the first R.F. stage of a receiver often determines its performance.
9. 5,650 to 5,850 Mc/s.
10. In a London tea shop during a discussion between Gerry Marcuse, G2NM and the late H. Bevan Swift, G2TI.

HENRY'S

We are pleased to announce that we are once again able to offer a return of post service.

A.M. RECEIVER UNIT, TYPE 161. Comprising 2 EF54, RL37 and EC52. Coils, relay and many condensers and resistors. The whole in metal box, size 8 1/2" x 6 1/2" x 3 1/2". New, a bargain, at only 15/-, carriage paid.

RCA 931A PHOTO-ELECTRIC CELL AND MULTIPLIER. For facsimile transmission, flying spot telecine transmission and research involving low-light-levels 9-stage multiplier. Brand new and guaranteed. Only 30/- including special 11-pin valve-holder, also. Included free is a data sheet, plus details of the resistor network.

TRANSMITTING VALVES. 805 at 10/-. Westinghouse 813 at 50/-. 832 at 15/-. 866A at 15/-. Klystron 723A/B at 82/6. 829B at 59/6. All brand new and boxed.

VALVES. The following valves, ex-Government, brand new and guaranteed, can be supplied: 6J6 at 12/6. 6AK5, 6EN4/6, 6L6 metal at 10/- each. 25A6G, EF50, EF54, EF55, RZ37, VU120A, VU111, VU135, U18, 5T4, 5R4GY, RL18, 6P7, 6K6, 6AG5, PM22A, all at 7/6 each. U22, 5U4, 6SN7GT, 5Z4, MU14, 6K7GT, 6J7GT, 6B37, 6K8GT, ML4, 12SR7, 12SJ7, 12SK7, 6SL7GT, 6SC7GT, 6CS, 6V6G or GT, 7C7, 7T4, 787, 7B6, 7C5, 1299A, 9D2, VP25, P2, 12A6, 8D2, 15D2, EF36, EF39, EBC35, EK32, EL32, 6X5GT, 2X2, 6AC7, 6N7, 78, 9003, IN5GT, 6J5GT, 6CS, KTW61, D185, TDD2, VP2B, AC6Pen, EF8, KT2, 220DET, 220SG, all at 6/6 each. Also 9002 and ILN5GT, 8/6. 807, 7/-, 4D1, 5/-, EA50, 8P61, 954, EB34, at 3/6 each. DI Diode at 2/6 only. And the midrange of 1.4v. battery valves IT4 and IS5 at 6/6 each. IR5 and IS4 at 7/6. 3S4 at 9/- each. Most of these valves are boxed. In addition to the above few types we have tremendous stocks of both ex-Govt. new valves at equally competitive prices and B.V.A. valves at current B.O.T. prices.

SPECIAL PURCHASE. Brand new Standard Telephones H 4/200 E.H.T. pencil rectifiers, 2,400v. 3 m.a., only 15/- each.

SLIDER POTS. As used in all the latest T.V. sets. A bank of four, comprising, 2 of 10K, 100 ohm and 500 ohm. Only 6/- the set. Easily split up.

"DENCO" ALIGNMENT OSCILLATOR D.A.O.I. This unit provides a modulated signal for the alignment of IF amplifiers and associated circuits.

The two standard frequencies of 465 Kc/s and 1,600 Kc/s are selected at the turn of a switch. All supplies are derived from one U10 cell and one 1289 battery inside the unit. Consumption of 50 m.a., single valve type DL92 is used. Dimensions of case: width 3 1/2", depth 2 1/2", height 4 1/2". Price only 39/6, post free.

BANGAMO-WESTON. Ex-Govt. 0.1 m.a. M.c. meters. 2 1/2" panel-mounting. Absolutely brand new, 15/- each only.

5KV ELECTROSTATIC VOLT-METER. 0-5KV, panel-mounting, 3 1/2" scale, brand new, 50/- each.

RECEIVER TYPE 25. The receiver portion of the T/R 1196. Covers 4.5-6.7 Mc/s, and makes an ideal basis for an all-wave receiver, as per "Practical Wireless", August issue. Complete with valves type EF36(2), EF39(2), EK32 and EBC35. Supplied complete with necessary conversion data for home use. Only 22/6. Chassis only, 8/6.

A SIGNAL TRACER at minimum cost. An easy-to-build unit that can be used for R.F., I.F. and Audio signal tracing, without any switching or tuning. Highly sensitive, easy to build, responds to signals picked up from an ordinary receiving aerial. The circuit is that of a high-gain, 3-stage resistance-coupled audio frequency amplifier, with a 5" speaker in the Output of the Power Amplifier stage.

We shall be pleased to supply a complete kit for the construction of the above, right down to the last nut and bolt, for the low price of £3/18/6. Concise instruction and circuits are supplied. If preferred, circuit and instructions only can be supplied for 1/6 post free. All items may be purchased separately. This is a highly efficient instrument, and a MUST for every radio man.

THE "MONTROSE" MULTIMETER by Taylor Electrical Instruments, Ltd. Moving iron, robust, moulded case, simple, for home or workshop. Ranges, 0-6.30-150-300 volts, 0-30 m.a./300 m.a./3A. A.C. and D.C. A 1.5v. battery is fitted internally, for circuit tests. Size 3 1/2" x 3 1/2" x 1 7/10"; weight 7 oz.; price £2 only.

No. 18 SET, RECEIVER PORTION. A four-valve superhet receiver operating from 6-9 Mc/s. (35m-50m). Valve line-up 3 ARP12 (VP25), and AR8 (HL23DD). Requires only 120V. H.T., 9 V. G.B., and 2 V. L.T., in perfect condition, only 17/6, plus 1/6 packing and carriage. An absolute bargain. Suitable brand new headphones can be supplied at 3/6 per pair.

N.B.—Each receiver is tested working, prior to dispatch.

These above items are only few, compared to our very vast stocks. We are specialists in Radio Components for all purposes, and will be pleased to receive your enquiries for any items in which you may be interested, not listed above.

We are situated at the junction of Edgware Road, and Harrow Road facing Edgware Road Tube Station.

If unable to call please send stamp for Current Comprehensive Component List.

5, HARROW ROAD, W.2

OPEN ALL DAY SATURDAY.

R3515 I.F. STRIP.

A complete I.F. Unit, comprising 6 SP61 I.F. Stages, tuned to 13.5 Mc/s., 1 EA50 diode detector, and 1 EF36 or EF39 output or video stage. A few modifications only, are required to adapt this unit which will give pictures, of extremely good quality. Price complete with valves, and fool-proof modification instructions, is 45/-, plus 3/- packing and carriage. Limited quantity only.

TYPE 6A INDICATOR UNITS. As recommended for ex-Govt. T.V. construction. Absolutely complete (included VCR97 with mu-metal shield, 4 EF50 and 3 EB54). Limited quantity only, at 67/6 each, plus 7/6 carriage and packing.

TYPE 6C INDICATOR UNITS. Comprising 3 1/2in. VCR158 C.R.T. with mu-metal screen, 2EF50, 2 EB34, plus high voltage condensers and resistors. In good condition, price 45/- only.

WAVE-FORM GENERATOR TYPE 34, EX. A.M. Including 6 SP61, 4 EF36, 2 EB34 and one CV115. Also relays, transformers, pots, condensers and resistors. The whole contained in metal box, size 11 1/2" x 11 x 8 1/2". In clean condition, an absolute bargain at 25/-, plus 3/6 packing and carriage.

D.C. AVO MINOR. Brand new and boxed, but slightly soiled. Limited quantity. Not ex-Govt. Only 55/- each.

POCKET VOLT-METER. Ex-Govt. Two range 0-15v., 0-250v. D.C. Brand new and complete in Web carrying case, only 10/6.

METER DISTRIBUTION BOARDS. Comprising 0-300v. M.I. Meter, 3 1/2in. A.C./D.C. Input Plug and Socket, 3 Output Sockets, 2 porcelain fuses. Total size 12 x 6 1/2in. Brand new and individually boxed, 17/6 complete.

MICROMETER. 0-500 micro.a., 2 1/2in. scale, moving coil, panel-mounting, 7/6 each.

5KV. ELECTROSTATIC VOLT-METER. 0-5 Kv., panel-mounting, 3 1/2in. scale, brand new, 50/- each.

R.F. UNIT, TYPE 24. For 26-30 Mc/s. Preset, switched tuning, incorporating 3 valves, SP61, brand new, only 16/6. This unit can now also be supplied, modified to cover RF26 frequency (for Midlands T.V.) at 25/-, brand new.

VCR139A C.R. TUBES. Electrostatic 2 1/2in., tested and guaranteed O.K. Only 15/- each, plus 2/6 post and packing. Bases can be supplied at 2/- each.

6in. CATHODE RAY TUBES. VCR97, electrostatic, non-persistent, individually boxed, ready for transit, 35/- each only. Postage and packing free. Side control base for above, 2/-, 6in. Marks for above. Not ex-Govt., but specially manufactured to give rectangular picture. White 7/6.

TUBE ENLARGING LENS. For VCR97, or 5CP1. Double your picture area, without distortion. Easy fixing. Really amazing in performance. First-grade. Only 25/-.

OSMOR MIDGET "Q" COIL PACKS. Size 3 1/2" x 2 1/2" x 1 1/2". Amazing performance. Polystyrene formers with adjustable iron cores. One-hole fixing, only five connections. Factory aligned complete with full receiver circuits, and instructions. S'het for 465 kc/s, 33/- only. L.M.S. also for TRF operation, M. and L. W., 30/-.

We can now offer the latest "Q" pack for S'het battery operation. Complete with circuits incorporating either 1A7 or 1T4 series Valves. This pack is supplied with ready-wound frame aerial. Price 37/6.

Please note that separate H.F. stage, for addition to the above Mains Superhet Coil Pack, can now be supplied at 15/- only. Complete with all necessary easy-to-follow instructions.

E.H.T. TRANSFORMERS. Output 2,500v. 5 m.a. 4v. 1.1 amps. 2-0-2v. 2 a. (for VCR97), 35/- only. Output 3,250v. 5 m.a. 6.3v. 1a. 2-0-2v. 2 a. (for 5CP1), 39/6. Output 4,000v. 10 m.a. 2-0-2v. 2 a. 48/- only. Output 5,000v. 16 m.a. 2-0-2v., only 60/- only. All input 250v. and fully guaranteed.

IGRANIC MAINS TRANSFORMER. A special purchase enables us to offer the following:—250-0-250, 70 m.a., 6.3 V., 2a., 5 V., 2a., half-shrouded, drop-through type, with voltage adjuster panel. Absolutely brand new and guaranteed. 15/- only, plus 9d. post.

R.1355 MAINS TRANSFORMER. 200/250 V. input. Outputs 250-0-250, at 120 m.a., 6.3 V., at 6a., 5 V. at 3a. Fully shrouded top chassis mounting and guaranteed 100 per cent. Only 28/6.

MINIATURE MAINS TRANSFORMER. 250-0-250, 60 m.a., 6 V., 3a., 5 V., 2a., fully shrouded, well finished, size 3 1/2" x 3" x 2 1/2". Price 21/-.

DUAL PURPOSE MAINS TRANSFORMERS. Special 350-0-350 V. 80 m.a., 6.3 V. tapped 4 V., at 3a., 5 V. tapped 4 V. at 2a. Top chassis mounting, and fully guaranteed. 18/6 only (plus 9d. post).

AROUND THE REGIONS

Ariel Radio Club

The club transmitter was operated under the call G3GDT/P at the annual Gala Day of the B.B.C. Club at Mottspur Park, Surrey, on Saturday, June 10. Operators included G3BBU, 3BEG and 3CJQ.

Cambridge & District Radio Club

Although full-scale "Junk Sales" are a comparatively rare feature of the Club's activities, a "Bring and Buy" table is kept available at every meeting. Ten per cent. of the proceeds goes to help Club Funds.

Coventry

Final preparations have now been made for the 144 Mc/s. Field Day, the first to be held in Coventry. In addition to G3ABA/P on 144 Mc/s., G5PP/P is to operate on 1.8 and 420 Mc/s. Tests on the latter band are being made in conjunction with the Solihull Radio Society. Free QSL cards are available to R.S.G.B. members living in Coventry. Those wishing to avail themselves of this scheme should write to Mr. R. Palmer, G5PP, 22 Sherlock Road, giving call-sign or B.R.S. number, name and full postal address.

Grafton Radio Society

After having held three meetings each week throughout the year, the activities of the Society will be suspended during August. The new session will re-open on Monday, September 11, with the Annual General Meeting. The last meeting during the current session was held on July 28, and the final of the current series of Field Days took place on July 22-23 at Parliament Hill Fields. Full information can be obtained from the Hon. Secretary, Mr. W. H. C. Jennings, G2AHH, telephone STA 3891.



The Grafton Radio Society Stations, located at Parliament Hill Fields, North London, gave points to numerous N.F.D. stations. During the weekend G3AFT/P W.A.C. Left to right: G3BJK, G2AHH, BR517165, BR57751 and G2FRP. (Photo: G2AOW)

Lewisham Area

A most interesting demonstration of the Wireless Services of the Metropolitan Police was given by Mr. W. Andrews, G2YG, during the course of a lecture delivered last month at the Lewisham Area meeting. Radio contact was made with cars and with Scotland Yard while the technical aspects of the equipment were explained with the aid of large photographs. The July lecture will be on Television Interference and will be given by Mr. J. S. Hizey, of the G.P.O.

North Kent Radio Club

The call-sign of the club station, mentioned in "Around the Regions" last month should have been G3ENT and not G3EHT. The call G3EHT is held by Mr. J. Tremain, A.M.I.E.T., of Little Petherick, Cornwall.

Stourbridge & District Amateur Radio Society

At a meeting of the Society held at King Edward VI School, Stourbridge, on June 9, a large gathering of members and guests from many parts of Worcestershire listened with great interest to an address entitled "The Future of Amateur Radio" delivered by the General Secretary of the R.S.G.B. Mr. Clarricoats spoke of the work achieved by the I.A.R.U.

representatives to the Atlantic City Conference in 1947 and of the preparatory work that would be necessary prior to the Buenos Aires Conference in 1952. He referred to the I.A.R.U. Congress which had just taken place in Paris and to the Special Administrative Conference due to be held in The Hague during the coming autumn. At the conclusion of his address Mr. Clarricoats answered questions on a variety of topics of general interest.

Warrington & District Radio Society

During June, talks were given by G3EXG on "Decibels" and G3LZ on "3 cm. Operation." A working demonstration of 3 cm. equipment will be given in the near future by G3LZ and G3BAK, who were the first U.K. amateurs to make two-way contact on this band. July lectures included: "Valves," by G8TR, and "Basic Radio," by G3EXX.

Watford Radio & Television Society

A course on "Radio Fundamentals" is being given by Mr. R. T. Youens, G2HAR, at the meetings held on the first and third Tuesdays in each month. Recent subjects have included "Safety Precautions" and "Frequency Measurement." Plans are afoot for a hidden transmitter hunt while Field Day preparations for next year are already being discussed. All R.S.G.B. members are welcome to attend the meetings; details from the Hon. Secretary, 32 Cassiobury Drive, Watford.

Hannover Hamfest

Some forty amateurs, including 5 OZs, 4 DL4s, and many DL1s and DL2s, attended the annual Hamfest in the British Zone of Germany, held this year at Stirling House, Hannover, on June 3-4. Mr. George Oxley (DL2MW) was in the chair. Official German representatives included the Chairman (DL1WA) and Secretary (DL1JB) of the Deutsche Amateur Radio Club (B.Z.). Unfortunately the expected party from the United Kingdom did not materialise. After a discussion on licensing arrangements in the Zone, each amateur present gave a short account of his or her (OZ4YL was a welcome visitor) activities and most amusing experience "on the air."

On the Sunday a visit was made to a 40 cm. station at the Annaturm, one of the chain of radio relay stations which extend from the North Sea to the Alps. A simple one-valve oscillator carries 8 F.M. channels; and distances of 50 miles are covered with a power of one watt.

Region 1 Field Day

At a meeting of Region 1 Representatives held in Preston last month, it was decided to hold a Regional Field Day on August 27. The Field Day will commence at 8 a.m. and finish at 8 p.m. and the rules will be similar to those used for N.F.D. Stations will operate on 1.8 and 3.5 Mc/s. and prizes will be awarded to the leading stations. Transmitting will start at 9 a.m.

This event—which may well be the forerunner of many more of a similar character—will enable field-day enthusiasts to "air their rigs" once more before the summer season ends. It will also provide newcomers with a valuable opportunity of gaining field-day experience.

Further details can be obtained from Region 1 Representatives.

Silent Keys

It is our sad duty to record the death, on June 10, of Mr. L. W. J. (Bill) Robbins, G6SB, of Pinner, Middx., from injuries received as the result of a tragic accident. Active on all bands from 1.8 to 420 Mc/s., he was an R.A.F. flying instructor during the 1939-45 war. Aged 28, Mr. Robbins leaves a widow and three children, to whom our deepest sympathy is proffered. G2AHC.

It is also with deep regret that we report the death of Mr. Douglas Wells, B.R.S. 13680, of Attleborough, Nuneaton, at the early age of 30, following a long illness. A keen S.W.L. from his schooldays, he took part, during his 6½ years' Army service, in many of the major campaigns. Due to illness he never achieved his ambition of qualifying for an amateur licence but will be remembered by his many friends for his patient H.F. work and his cheerful smile in the face of all difficulties. G3ACJ.

Members will learn with sorrow of the death, on March 10, of Mr. Frank B. Jenkins, G3AXT, of Bridgwater, Somerset, as the result of a motor-cycle accident. A keen amateur with a fine Service record, '3AXT joined the Royal Navy at the age of 16 years and completed 24 years of service (including 15 years in the Submarine Branch), attaining the rank of C.P.O. During the 1939-45 war he again volunteered, this time for service with the Royal Corps of Signals. G5RV.

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1,000 kc/s. Crystals in metal cases with resistances, etc., 10/- each. Post 1/-.

Electron Multiplier. Photo Cell (RCA 931/A), 25/-

R1155. New in Transit cases, £9, carriage 10/-.
6-Valve. 25 sets £1. Carriage 2/6.

No. 18 4-Valve Superhet Short-Wave Battery Receivers 17/6. Carriage Paid.

24-Volt Blower Motors, 7/6 each. Carriage 1/-
0 to 1 Moving Coil 2" FSD Milliammeters, 12/6.
0 to 500 Microammeters, 7/6 each.
0 to 200 Milliammeter 4/- each.

Headphones. Balanced Armature, 5/- pair. Carriage 1/-.

Dipole Aerials, 5/- each. Post 1/-.

Brand New in cartons (Ex-U.S.A.) S.C. Crystal. Multiplier complete with valves, 35/- Carriage 2/6.

B'ham "H"-type Aerials, 15/- Carriage 2/6.
First-class Morse Code Tappers, 2/6 each.

Cash with Order, Please.

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VALVES.—607GT, 5U4C, 5Z4, V960 E.H.T. Rect. 5 kV. 10 mA., 6X5, 6K7GT, 6/6; 9001, 9002, 9003, 5/-; 6K7 Metal, 5/6; 954, 955, 3/6; 6V6, 6C8, 807, 7/6; 1S5, 1S4, 6/6; 1T4, 1R5, 7/6; Y63 Tuning Eye, 8/-; 354, 8/6; 6L6C or M, 10/6; 117Z6, 12/6. All post paid.
SELENIUM RECTIFIERS.—H.W. 250 V. 60 mA., 4/6; 120 mA., 6/6; F.W.6 or 12 V. 1.5 A., 10/6; 6 or 12 V. 4A, 25/- Post 6d. on each.

MAINS POWER SUPPLY UNIT.—In black enamelled case, 9" x 6" x 5". Contains heavy duty transformer valve rectifier, smoothing choke, condensers, panel light, switch and fuse. Input 200/260 V. A.C. Output 6.3 V. at 3.5 A. H.T. 350 V. at 80 mA. Power unit for R1155-R1132A, etc. Jones plugs supplied with each. Price £3/5/0.

TYPE R1359 Receiver Power Unit.—In grey steel case 8" x 9" x 6 1/2". Contains two separate complete power units with outputs of 390 V. at 80 mA., and 300 V. at 60 mA., each with 6.3 V. 3 A. L.T. Price £4/12/6.

MAINS TRANSFORMERS.—Our own make—12 months' guarantee. Input 200/240 V. Output 6.3 V. 1.5 A., 7/6, post 9d.; 6.3 x 6.5 V. 2 A., 25/6, post 9d.; 4V. 8A., 25/6; post 9d.; 300-0-300 V. 120 mA., 6.3 V., 3.5 A., 5V., 2.5 A., 21/6, post 1/- Also 350-0-350 at same price.

Special Offer 230/4 or 6 V. 4 A., 6/9, post paid.

MULTI-RATIO OUTPUT TRANSFORMERS.—20 W., 17/6, post 9d. 30 W., 25/-, post 9d.

NEW MINIATURE CONDENSERS in ali-cans, 450 V. D.C.W., 8 μF., 3/6; 8 x 8 μF., 16 x 8 μF., and 32 μF., 4/9 each, post paid; 32 x 32 μF. 350 V. 6/6, post paid.

TU9B UNITS.—New, complete in black crackle cases, 17/6, carriage paid.

MINIATURE S.M. DIALS.—100-1 worm geared; 2 1/2" x 2". Beautifully made. Dial 0-100, 3/6 each, post 9d.
NEW ARMY MORSE KEY & BUZZER SET, 4/6 post paid
0-500 MICROAMMETERS.—2", 500 ohm internal resistance, 7/6 each, post 6d.

U.S. CARBON MICROPHONE, as used with type 58 sets, 2/6, post 6d. Transformer to match, 2/6, post 6d.

M/C MICROPHONES.—3 1/2", round, with pressel switch, 5/-, post 6d. Transformer to match, 5/-, post 6d.

PHONE ADAPTORS.—Converts low impedance phones to high impedance, 1/-, post 6d.

NEW BROWN'S moving Reed Phones. Finest made, 5/-, post 9d.

POWERFUL MINIATURE MOTORS with geared spindle, 24 V. or 110 V. A.C./D.C. 3 1/2" x 2 1/2" x 2, 8/6, post paid.

TRANSFORMERS.—230/24V., 16/-.

24 V A.C./D.C. MOTORS.—5" x 3", fitted with powerful blower fan, 14/-, post paid.

TRANSFORMERS.—230/24V., 16/-.

RF24 UNITS.—Converted to 28 Mc/s. band. Variable tuned with 100-1 geared S.M. dial. Complete with plug and leads for immediate use, £2/5/0, post paid.

NEW IN34 CRYSTAL DIODES, 5/3, post paid.

NEW ARMY MORSE KEYS, 2/9, post paid.

P.M. SPEAKERS.—5", 10/6, post 1/-; 8", 16/-; post 1/-; 10", 20/-, post 1/-.

TWIN-GANG VARIABLE CONDENSERS.—.0005 μF., 4/6; 3-gang, 5/6, post paid.

NEW 250 W. Double Wound TRANSFORMERS. 230 V./115 V. Made by G.E.C. in grey steel cases. New, 47/6 each, carriage paid.

This Issue

It is regretted that, due to the withdrawal of overtime working by a section of the Printing Industry, this issue—the first to be printed in London for 11 years—appears very late.

Congratulations

TO Mr. Charles R. Thompson, G8WI, Senior Scientific Assistant, Headquarters No. 90 Group, R.A.F., who was recently awarded the British Empire Medal.

It is understood that the award was made in recognition of sterling work in the re-siting, installation and calibration of airfield radar nav-aids in Germany during the hectic days of the Berlin air lift.



Aircraft Distress Procedure

DEAR SIR,—Referring to the article on the above subject published in the June issue I should like to correct one or two points.

(1) QAH is not used by aircraft to ground stations. When an aircraft indicates its height it must do so by including its relation to cloud: the Q signals to be used are, therefore, QBF, QBG, QBH, QDT or QDV—so if the aircraft was in cloud at 5,000 feet "QBF 5,000 ft." would be used.

(2) The Distress text up to and including the aircraft type should be repeated before sending the nature of Distress, intention of aircraft Captain, 20 second dash, call sign once and K.

(3) QJT like QAH is not used in general practice by aircraft. To give the correct interpretation of speed, QTK is used, the reason being, of course, that the speed in relation to the ground is more useful than air speed, which can differ greatly from the ground speed.

(4) QAD and QAC are no longer used and have been replaced by QTN and QRF respectively with the same basic meaning.

(5) QAL though correct is rarely used, preference being given to QTP meaning "I am about to alight or enter dock or port."

My remarks above, particularly in respect of QJT and QAH do not conform with M.C.A. P5 2nd Edition Distress Procedure, but nevertheless are correct.

Yours faithfully,

E. J. C. JONES (G3DQH).

Bournemouth, Hants.

Our contributor writes as follows:—

Taking the very interesting points raised by G3DQH in order, here are my comments:—

(1) QAH is, and should be, used; the other "Q" signals can however be used (not must be used).

QBF = I am flying in cloud at a height of —.

QBG = I am flying above cloud at a height of —.

QBH = I am flying below cloud at a height of —.

QDT = I am flying in accordance with Visual Flight Rules.

QDV = I am flying in horizontal visibility of less than 3 statute miles at a height of —.

(2) Correct—as per book. It depends on the urgency whether it is done!

(3) Up to about two years ago QJT meant "Ground Speed," which is, of course, the most useful item. QJT—AIR meant airspeed. A recent amendment introduces QTK for ground speed and amends QJT for speed only, so either can be used. It depends on whether the QTK is available at the time of distress.

(4) QTN takes the place of QAD, and QRF replaces QAC.

These were recently changed, as the implementation of decisions at the I.T.U. conference at Atlantic City, which transferred several "Q" signals from the Aeronautical Allocations group to the General "Q" code group.

(5) QTP is not correct for aircraft use, although it may be used, especially in distress, by operators with other than airborne commercial experience.

Readers are referred to page 417, June BULLETIN, for the beginning of the argument.

H. E. B.

Around the Trade

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