January 1951

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Vol. XXVI No. 7 **Contents** JANUARY 1951

Forthcoming Events

REGION 1

Ashton-under-Lyne.—February 4, 3 p.m., New Jerusalem School.
Blackpool.—February 20, 7.30 p.m., Barclays Bank Chambers, 2 Birley Street (2nd floor).
Bolton.—February 6, 8 p.m., Y.M.C.A.
Bury.—February 8, 7.30 p.m., Y.M.C.A.
Darwen & Blackburn.—January 26, February 9, 7.30 p.m., Y.M.C.A., Limbrick, Blackburn.
Liverpool.—February 3, 2.30 p.m., 29 Derby Lane, Old Swan.
Oldham.—Alternate Wednesdays, Civic Centre, Clegg Street.
Manchester.—February 12, 7.30 p.m., Reynolds Hall, School of Technology, Sackville Street.
Preston.—January 26, February 9, 7.30 p.m., Three Tuns Hotel, North Road.
Rochdale.—February 4, 3 p.m., Drill Hall, Baron Street.
Southport.—February 19, 8 p.m., 38a Forest Road.
Wirral.—January 17, 31, 8 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—January 26, February 9, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—January 30, February 13, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Tuesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 25 Coniscliffe Road.
Doncaster.—February 14, 7.30 p.m., Black Bull Hotel, Market Place.
Gateshead.—Thursdays, 7 p.m., Y.M.C.A., Sutherland Hall, Durham Road.
Hull.—January 31, 7.30 p.m., R.E.M.E. Barracks, Walton St.
Leeds.—Fridays, 7.30 p.m., Swarthmore Educational Settlement, Woodhouse Square.
Middlesbrough.—Thursdays, 7.30 p.m., All Saints' Hall, Grange Road.
Newcastle-upon-Tyne.—February 19, 8 p.m., British Legion Rooms, 1 Jesmond Road.
Rotherham.—Wednesdays, 7 p.m., Oddfellows Hall, Westgate.
Scarborough.—Thursdays, 7.30 p.m., L.N.E.R. Rifle Club, West Parade Road.
Sheffield.—January 24, 8 p.m., Dog & Partridge, Trippet Lane; February 14, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—January 24, February 7 (Annual Meeting), 7.30 p.m., Temperance Hall, Cleckheaton.
Wakefield.—January 24, February 7, 7.30 p.m., Service House, Providence Street.
York.—Wednesdays, 7.30 p.m., Community House, Falsgrave Crescent.

REGION 3

Coventry.—January 19, February 16, 7.30 p.m., Priory High School, Wheatley Street.
Birmingham.—February 21, combined meeting of M.A.R.S. and R.S.G.B., 6.30 p.m., Imperial Hotel.
Stourbridge (S. & D.A.R.S.).—January 26, Corn Exchange Vaults; February 6, talk by Mr. C. Naylor Strong, G2RQ, at H.Q.
Malvern (M. & D.R.S.).—February 7, 8 p.m., Foley Arms Hotel, "Magnetic Recording" by Mr. E. Dandy.

REGION 4

Derby (D. & D.A.R.S.).—January 17, 31, 7.30 p.m., Clubroom No. 4, School of Arts and Crafts, 119 Green Lane.
Leicester (L.A.R.S.).—January 15, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Newark.—January 21, Rutland Hotel, Barnby Gate.
Northampton.—Fridays, 6 p.m., Club Room, 8 Duke Street.
Nottingham.—January 22, 7.30 p.m., Lord Nelson Hotel Carlton Street.
Spalding.—January 25, 7.30 p.m., 10 South Parade.

REGION 6

High Wycombe.—January 23, 7.30 p.m., at G3BZM, 7 The Quadrant, Totteridge.

REGION 7

Barnes & Richmond.—February 13, 7.30 p.m., 22 Lowther Road, Barnes.
Brentwood.—February 2, 16, 8 p.m., Drill Hall, Ongar Road.
Chingford.—February 1, 15, 8 p.m., A.T.C. H.Q., Pretoria Road.
Croydon (Surrey R.C.C.).—February 13, 7.30 p.m., "Blacksmith's Arms," South End, Croydon.
Dulwich & New Cross.—February 5, "Kentish Drovers," Rye Lane, S.E.15.
East Ham.—February 1, 15, QTH from T.R.
East London District.—January 21, 3 p.m., Ilford Town Hall: "Ship-Shore Radio Communication," Mr. W. Swanson, of Overseas Telecommunications Dept., G.P.O.; February 18, "440 and 144 Mc/s. Transmitters and Receivers," Mr. D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E., G5CD.
Edgware (E. & D.R.S.).—Wednesdays, 22 Goodwin Avenue, Mill Hill.
Enfield.—January 21, February 18, 3 p.m., George Spicer's School, Southbury Road.
Finsbury Park.—January 23, 7.30 p.m., 164 Albion Road, Stoke Newington, N.16.
Gravesend.—Wednesdays, 7.30 p.m., 30 Darnley Road.
Guildford.—January 28, February 25, 3 p.m., Royal Arms Hotel, North Street.
Hampstead.—January 19, 1 Broadhurst Gardens, N.W.6.
Hayes & Uxbridge.—February 4, 7.30 p.m., "The Vine," Uxbridge Road.
Hoddesdon.—February 1, 15, 8 p.m., "The Salisbury Arms."
Holloway (G.R.S.).—Mondays, Wednesdays and Fridays, 7.30 p.m., Grafton School, Eburne Road, N.7 (one minute from the "Nag's Head").
Ilford.—February 6, 8 p.m., 125 Hampton Road.
Lewisham (R.A.R.C.).—Wednesdays and Thursdays, 7 p.m., Childeric Road School, New Cross.
New Barnet.—February 17, 7.30 p.m., "Bunny's Restaurant," Station Road.
Norwood District.—January 28, 2.30 p.m., G2VB, 35 Grangecliffe Gardens, South Norwood. Bus 49, 68 and 68a to All Saints' Church. A p.c. if attending.
St. Albans.—February 14, 8 p.m., "The Beehive," London Road.
Slough.—February 15, 7.45 p.m., The Golden Eagle Hotel, High Street.
Sutton & Cheam.—January 16, February 6, Sutton Adult School, Benhill Avenue.
Welwyn.—February 6, 8 p.m., Council Chambers.
Woolwich & Plumstead.—February 3, 14, 8 p.m., Bull Tavern, Vincent Road, S.E.18.

(Continued on Page 269)

R·S·G·B

BULLETIN

For the advancement of Amateur Radio

VOLUME XXVI No. 7 JANUARY 1951

GREEN-FINGERS

ALMOST exactly five years ago transmitting licences were reissued in this country: The war had ended with the most complete defeat of the nation's enemies ever recorded in our long history. No wonder, then, in 1946, all thoughts of conflict were cast aside and British amateurs turned once more to the peaceful pursuit of their hobby.

But today all that has changed. Only an incurable optimist or an amateur with his head buried deep in QSL cards could be oblivious of the real and immediate threat to the peace of the world. In fact there are indications that amateurs are acutely aware of the gravity of the present international situation and thoughtful of the tasks which they might be called upon to fulfil if—once again—the world were to be plunged into war.

American amateurs, under the guidance of the A.R.R.L., are at present closely examining the requirements of an emergency communications service to assist their A.R.P. system. Indeed the recent *QST* editorial on this subject must have brought back to British readers vivid recollections of similar discussions in our journals and magazines during the late thirties. But while we wish our American colleagues every success in their endeavours, few British amateurs, with the experiences of 1939-45 in mind, would now consider that—in this country at least—it is in such services that the true value of the radio amateur is most likely to be demonstrated. Much nearer the mark would seem to be the observations of a North London member—published elsewhere in this issue—that the amateur radio movement represents a most important reserve of technically-minded persons for the fighting services, for the electronic industry and for the myriad organisations concerned with radio during wartime. His letter also points out that this pool of operating and technical skill, practical "know how," and adaptability has been created by the amateurs themselves, at no cost to the taxpayer.

There can be little doubt that the importance of radio communication and electronic devices in modern warfare is now fully recognised. Indeed vast sums are being expended to ensure that the armed services are equipped with the latest gear. Technically our research establishments are second to none. The struggle for radio supremacy, however, cannot be considered secure unless equal emphasis is paid—at all levels—to the "human element." Service chiefs sometimes appear to regard one maintenance engineer or one radio operator as very much like another; just so many "bodies" to be counted, interchanged or replaced in much the same way as the valves in the complicated equipment they service or operate. Such an impersonal approach is fraught with danger.

The last war taught us, surely, that it is on the man rather than on the machine on which the balance of war ultimately depends. In no branch of the services is this more true than in electronics. The difference between, for example, a hastily trained radio operator who has little or no background of technical knowledge, and the enthusiastic amateur who for years has lived and breathed in an atmosphere of forecasting short-wave propagation, copying messages through heavy interference and making hastily improvised repairs, is one that cannot be calculated in terms of just so many days or months of forced training. It is as wide a gap as exists between a first year apprentice and a master of his craft.

Gardeners have an apt term for those of their colleagues who have an especial flair: they are said to possess "green-fingers"—every seed they sow germinates, the most tender plants thrive under their care. We believe that such a state of affairs can be paralleled in radio communication and that a goodly proportion of the naturally gifted operators can be found in the ranks of the Amateur Radio movement. With a pile of junk and a few pieces of string such a man will get his traffic through without fuss or bother while his less talented colleague is still struggling to set up the latest high-speed automatic transmitter.

The task of attracting these "green-fingered" operators and technicians into special wireless reserves is one which might profitably occupy the attention of Service chiefs in the New Year.

There are signs that some of the Services are now approaching this problem with greater realism and more understanding of the "human element" than has been apparent during the past few years.

A SWITCHED WIDEBAND EXCITER

Part I—General Description and Design

By R. H. HAMMANS (G2IG)*

Transmitter design has inevitably tended to increase in complexity during the past few years. Modern practice now regards bandswitching and wideband characteristics—at least in the early stages of a transmitter—as being essential if maximum ease of operation is to be achieved. It is also becoming increasingly obvious that T.V.I. suppression should not be regarded as an operation to be carried out after a transmitter unit has been completed, but as an integral feature of its original design. Here, in the first of two articles, G2IG outlines the basic requirements of an up-to-the-minute exciter unit capable of providing a useful R.F. output in all amateur bands between 3.5 and 28 Mc/s.

SPECIFICATION

- **Approximately three watts of R.F. output in the 3.5, 7, 14, 21 and 28 Mc/s. amateur bands. *i.e.*, adequate power for driving a C.W. transmitter of 75 watts input, or, for example, an 807 amplifier preceding a plate modulated 150-watt triode power amplifier.**
- **Input power required is 3 watts in the 3.5 Mc/s. band. Source impedance suitable for feeding 75 to 100-ohm load.**
- **Input and output connections via 75 to 100-ohm coaxial cables.**
- **Single control band-switching.**
- **Output voltage constant to within 10 per cent. throughout the specified amateur bands, without tuning adjustments.**
- **Designed particularly with a view to minimising television interference.**
- **Metering of all anode and screen currents, H.T. voltage and R.F. output voltage by means of a single meter and rotary switch.**

THE advantages of a band-switched exciter are well-known and universally appreciated, but when the practical design and layout are attempted, difficulties are usually encountered owing to the long, high-R.F. potential leads which have to be switched. For this reason, the power output stage has normally to be built in close proximity to the exciter so that long grid leads may be avoided.

In order to permit the use of screened inter-stage connections without introducing prohibitive stray capacity and losses, it is necessary to transform the output impedance at each stage down to a low value suitable for coaxial cable. This low impedance coupling is, however, unsuitable for directly driving a subsequent frequency multiplier —owing to the relatively low voltage which can be developed across a low resistance load—unless excessive power is generated. Thus at each stage a dual output impedance is desirable: low impedance for the output load, and high impedance for driving the following multiplier. This point is illustrated in Fig. 1.

In the design to be described a good deal of thought was devoted to the determination of output power which an exciter should supply on each band. Valves of various types were considered as power amplifiers for which this unit would be called upon to provide driving power.

The eventual decision to specify 3 watts of R.F. output was arrived at by the following reasoning:

(1.) At least twice the grid driving power specified by the manufacturer of the P.A. valve must be available from any driving stage. This is necessary in order to allow for circuit losses and to ensure an R.F. source of good regulation so that unwanted harmonics are not generated in the P.A. grid circuit.

(2.) Not only adequate R.F. power is required, but a large enough *voltage* to drive the P.A. grid to the rated value must be reached. This is another way of saying that the drive power and the P.A. input impedance must both be taken into account. In the section which deals with the wide-band couplers it will be noted that an effective load of 3,300 ohms must exist across these couplers, so that in the case of many valves this load, rather than the input impedance, determines the power output required.

(3.) Consider an 813 valve. Although the makers quote a figure of 3 watts for driving power under Class C telephony conditions, they also state that about a 270-volt peak is needed. This means that approximately 180 volts R.M.S. must be developed across the 3,300-ohm load which consists of the valve input resistance plus terminating resistance in parallel. By a simple calculation:

$$\text{Watts in terminating resistance} = \frac{E^2}{R} = \frac{180^2}{3300} = 10 \text{ watts.}$$

Thus to drive an 813, using wideband couplers, at least 15 watts would have to be available on all bands. Not only would this demand a fairly massive exciter, but the wide band couplers would most likely overheat.

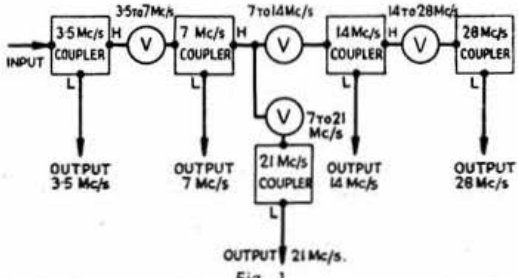

Fig. 1

Block diagram showing an exciter of the type described in this article. Terminals H and L on each inter-stage coupler represent "high" and "low" impedance outputs respectively.

(4.) Now in the pentode or beam tetrode range of transmitting valves, there is nothing readily available between the 813 and the 807. Three watts across 3,300 ohms will be found quite adequate to drive an 807 under all conditions.

(5.) No reasonable exciter of the type under discussion will provide enough power to drive a triode 150-watt stage, but an 807 used as a driver to a triode stage of this power would prove admirable.

(6.) From the T.V.I. point of view, it is not good practice to drive the final stage from a frequency multiplier. If an intermediate stage

* 28 Tudor Way, Petts Wood, Orpington, Kent.

between exciter and final is obligatory on this score, an 807 is a good choice. The design has been formulated on this basis.

Wide Band Couplers

The manufacturers* of the range of couplers used in this exciter have secured a substantially flat pass-band by the use of two tuned circuits over-coupled to the degree required to cover each amateur band. The response outside the bands drops-off with sufficient rapidity to ensure that only the wanted harmonic is selected and that spurious signals or unwanted combination terms are negligible. The couplers are designed to be terminated by a 3,300-ohm resistance, but in the design to be described, the modification necessary to provide both low and high impedance outputs and the particular circuit arrangements adopted result in a changed optimum value of load resistance.

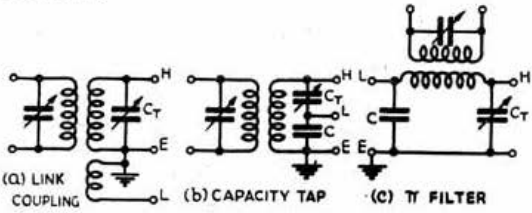

Fig. 2
Possible methods of obtaining dual high and low impedance outputs. That shown in (c) was finally adopted.

First attempts at achieving both low and high impedance outputs were not very successful. Link coupling from the secondary winding was tried—see Fig. 2 (a)—but as a rather poor wide-band characteristic resulted this was abandoned in favour of a capacity-tap system: Fig. 2 (b).

This circuit proved to have rather low efficiency with the values it was possible to achieve, principally because of the fairly large stray capacities appearing across the secondary winding due to valve input and wiring capacities. The final circuit shown in Fig. 2 (c) worked admirably and was adopted throughout the exciter.

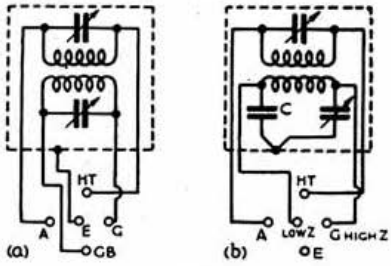

Fig. 3
Circuits and 5-pin valve-holder connections of (a) unmodified and (b) modified wide-band couplers as manufactured by *Labgear Ltd.*

Grid Bias Circuits

Examination of Fig. 3 (b) will disclose that there is no longer a D.C. path through the secondary coil between grid and earth, due to the presence of the condenser C. A D.C. path of some sort is, of course, essential; it is also necessary that the resistance of this path shall be capable of adjustment so that grid current bias has the correct value for operation of the valve as a frequency multiplier. A grid condenser and leak as shown in Fig. 4 (a) would be one method of providing bias, but a more convenient arrangement is shown in Fig 4 (b). In this circuit the grid leak—which has a value of about 30,000 ohms—appears across a 100-ohm impedance circuit, and imposes negligible loss. This reduces the number of components by six, *i.e.*, three grid condensers and three R.F. chokes. The cathode bias is adequate for protection of the valve in the absence of drive, *(e.g.,* during telegraphy working when the oscillator is keyed), but the grid current bias is needed to secure reasonable efficiency under driven conditions.

At first sight it would appear that the grid bias resistor will be short circuited by a 100-ohm load across the low impedance output. This is unimportant since, when loaded, the coupler is not driving the next valve, which has its cathode circuit opened by S2, etc. (see Fig. 5). Consequently there is no grid current bias to short out.

Band Switching

The block diagram in Fig. 1 shows the low impedance outlets from each stage, *via* which the drive to the final or driver valves is taken. In addition, the high impedance end of the coupler remains connected to the grid of the following valve. The latter arrangement is undesirable in that power is wasted by driving an unused stage, while damage may result owing to the fact that all

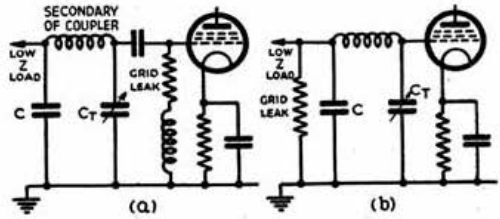

Fig. 4
Alternative methods of applying grid-leak bias. Method (b) reduces the number of components required.

succeeding stages are unloaded. To avoid these difficulties, switching is arranged so that the cathode circuits of all unused valves are opened: thus no grid, anode, or screen currents can flow; the valves and couplers are protected from damage; and no drive power is diverted from the wanted low impedance outlet. The R.F. switching proper is achieved on a single pole wafer having five or more positions; the screening or "outers" of the coaxial connections are of course made common to earth, while the inner conductors are taken in order of band frequency to the several positions of the switch. The travelling contact is connected *via* another short length of coaxial to the concentric output socket on the front panel of the unit. See Fig. 5.

Although the grids of all unused valves are prevented from drawing R.F. power, it will be seen that the valve and circuit capacities remain across the coupler secondaries since, although the cathodes are open circuited to D.C., the by-pass condensers remain between cathodes and earth. This ensures that the capacity in parallel with the trimmer, due to valve and strays, remains constant whatever the position of the band switch. It also avoids a rather complicated switching system which would otherwise be necessary in order (a) to disconnect the grids of unused valves from their associated couplers, and (b) to insert compensating trimmers for the purpose of re-establishing the total circuit capacity after the disconnection of the valve.

The switches used for R.F. and for the cathode circuits are ganged. It might have been possible to employ a single wafer for cathode switching

* *Labgear Ltd., Willow Place, Cambridge*

if a specially designed contact and traveller assembly were available. However, since standard types of components were considered essential in this design, a separate single-pole multi-way wafer was used for each cathode. Fortunately only four valves are involved so that a five wafer ganged switch will suffice for R.F. and cathodes. A twelve-way type switch was selected, because this pattern is most common, although only five of the twelve positions are active. Two-pole, six-way wafers would be equally satisfactory, in which case only three need be purchased.

Band Limits

Fig. 6 reproduces diagramatically the bands between 3.5 and 28 Mc/s. drawn to a scale which decreases in proportion to frequency. The purpose of this diagram is to illustrate the coverage required on all amateur frequencies in order to give complete coverage on the widest.

For example, it is clear that if the 3.5 Mc/s. coupler is adjusted to cover the band 3,500 to 3,800 kc/s. with a "flat" response, it will also cover all the other bands when used as a link in

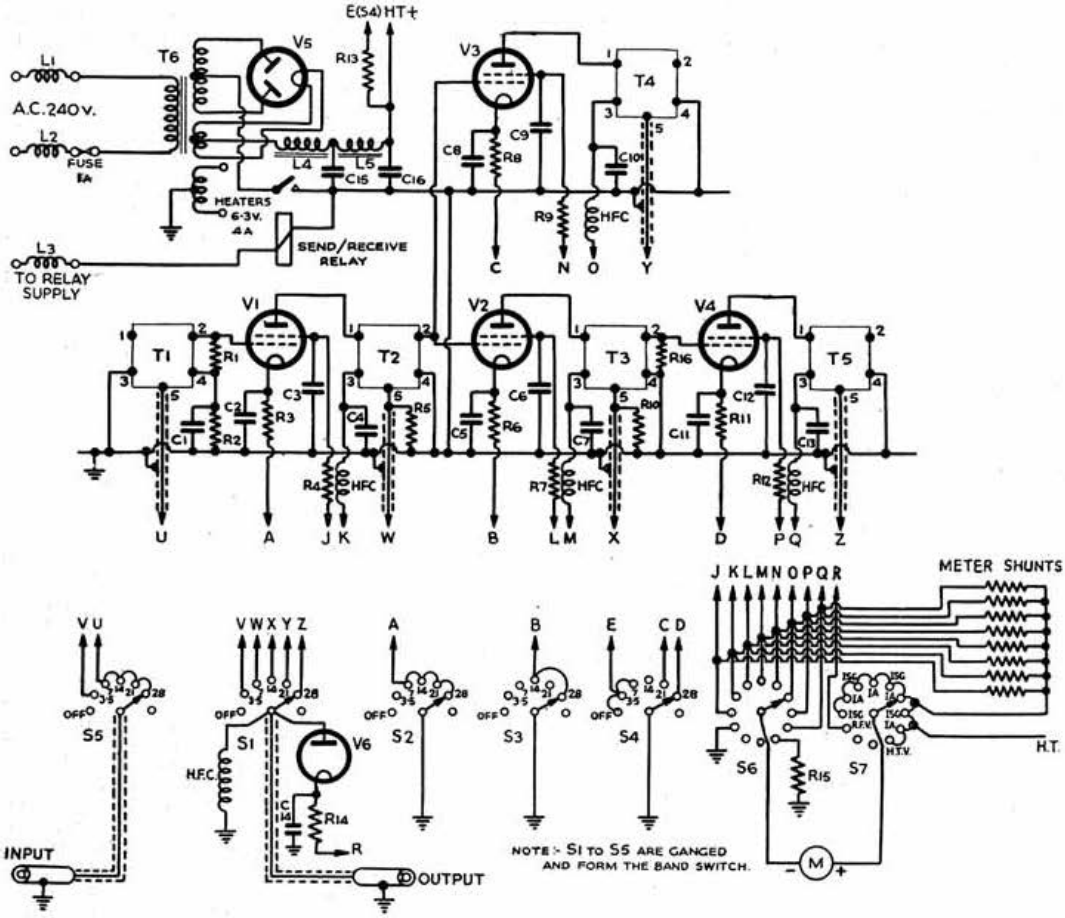

Fig. 5
Circuit diagram and switching arrangements of the wide-band exciter.

RESISTORS

R1. 3,300 ohms 1-watt.
R2. 47,000 ohms ½-watt.
R3, 6, 8. 1,000 ohms 7-watt.
R4. 15,000 ohms 1-watt.
R5, 10. 27,000 ohms ½-watt.
R7. 15,000 ohms ½-watt.
R9. 1,000 ohms ½-watt.
R11. 500 ohms 7-watt.
R12. 10,000 ohms 1-watt.
R13. 4,000 ohms 40-watt.
R14. 33,000 ohms ½-watt.
R15. 1 megohm 1-watt.
R16. 15,000 ohms 2-watt.

CAPACITORS

C1 to C14. .01 μF. 350-volt working.
C15, 16. .16 μF. 450-volt working.

INTERSTAGE COUPLERS

T1. *Labgear* 3.5 Mc/s. wideband coupler.
T2. *Labgear* 7 Mc/s. wideband coupler.
T3. *Labgear* 14 Mc/s. wideband coupler.
T4. *Labgear* 21 Mc/s. wideband coupler.
T5. *Labgear* 28 Mc/s. wideband coupler.

VALVES

V1, 2, 3, 4. 6L6 metal.
V5. 5U4G.
V6. 6D1.

POWER TRANSFORMER

T6. Output windings:
425-0-425 volts, 250 mA.
6.3 volts (C.T.), 4 A.
5 volts (C.T.), 3 A.

MISCELLANEOUS

L1, 2, 3. T.V.I. filters (see text).
L4, 5. 20 Henry 150 mA. smoothing chokes.
H.F.C. Five *Eddystone* H.F. chokes.
M. 0-1 mA. Scale reading 0-10.
Switches, Meter shunts, etc. (see text).

the chain. This is not true, however, of the 7 or 14 Mc/s. bands, because when the high frequency limits of the 7 Mc/s. and 14 Mc/s. bands are multiplied by four, or two, respectively, they fall well inside the 28 Mc/s. band.

In effect, this means that when serving as driving stages, the 7 and 14 Mc/s. couplers should cover 7 Mc/s. to 7.5 Mc/s. and 14 Mc/s. to 15 Mc/s., but when doing duty as low impedance output stages they should, if output and "flatness" are not to be sacrificed, cover neither more nor less than the appropriate band. The previously described modification to the couplers allows just this rather difficult dilemma to be circumvented. It is merely necessary to adjust the primary and secondary trimmers, while the coupler is functioning on low impedance load, so that maximum output at the L.F. end of the band is attained with the primary trimmer, and maximum output

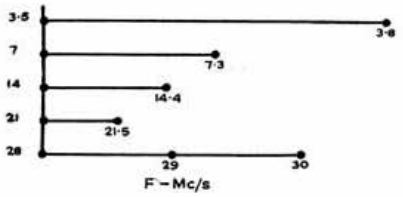

Fig. 6

Diagram showing the "width" of the amateur bands on a scale inversely proportional to the frequency. It will be readily seen that the harmonics of the 3.5 Mc/s. band more than cover the 28 Mc/s. band, whereas this is not the case with the remaining bands.

at the H.F. end with the secondary trimmer. When the low impedance load is removed from the secondary circuit, and the cathode circuit of the following valve is completed by rotating the band switch to a higher frequency band, the effective secondary capacity is thereby slightly reduced and a somewhat wider band pass characteristic is automatically provided.

No difficulties in this respect apply to the 21 and 28 Mc/s. bands. Here the couplers behave solely as output circuits and are not called upon to perform a two-fold duty.

21 Mc/s. Band

Although not yet allocated for amateur use, it was considered desirable to include facilities for this band in the exciter. A frequency tripler is therefore provided, driven from the 7 Mc/s. stage. After considering whether it would be best to switch the 14 and 21 Mc/s. couplers in the anode circuit of the valve driven at 7 Mc/s., or to drive two valves at 7 Mc/s. with grids paralleled—having the 14 Mc/s. and 21 Mc/s. couplers one in each anode circuit—it was finally decided to adopt the latter practice. The reasons for this decision were two-fold. First, a frequency tripler valve might require different working conditions from those of a doubler; separate valves, with individual screen, cathode and bias resistors would permit this without introducing any switching other than in the cathode circuits. Secondly, switching in the anode circuit would of necessity be at high impedance, and complications of switch location and other evils quoted earlier in this article would then arise.

* * *

Part II will give constructional details, alignment procedure, performance figures for the wideband exciter and suggestions as to input circuits for the driver or power amplifier stages.

A HANDY R.F. PROBE

By WALT ROGERS (W1DFS)*

EVEN the simplest transmitter adjustment usually requires some means of checking the presence and relative field strength of R.F. energy. Yet the amateur relies far too often on such uncertain—and dangerous—devices as a neon bulb or wooden pencil held in the hand. No wonder it is sometimes said that you can pick out an amateur by the R.F. burns on his thumb!

Here is a simple, sensitive and safe R.F. indicating probe which takes only a few minutes to assemble. The design (see Fig 1(a)) is based on a circuit published in the November, 1949, issue of *Radio and Television News*. The only components required are a pair of germanium crystal rectifiers (IN34), a dual wound R.F. choke, a 0-1 mA. (a more sensitive meter, if available, can be used with advantage) and a handle fashioned out of bakelite or other plastic sheeting.

A suggested layout is shown in Fig. 1 (b). The dimensions of the "handle" are not critical but those given will be found convenient and keep the operator's hand well clear of any live circuits. As an added safeguard a small hand shield can be fitted to prevent the user from accidentally touching the meter. The "handle" can be made from almost any $\frac{1}{8}$ in. to $\frac{1}{4}$ in. thick plastic material which has good insulating qualities. The crystal rectifiers are conveniently mounted by means of four 1/16 in. holes drilled through the handle. Although one rectifier only can be used, this arrangement is not recommended since the sensitivity of the probe is greatly reduced. The

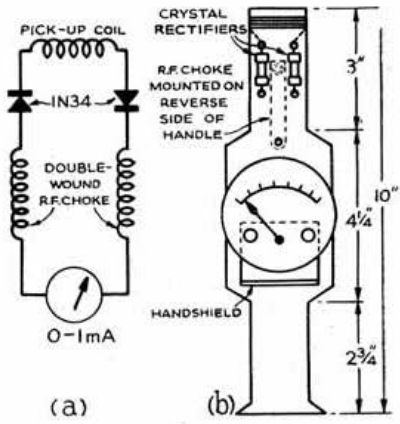

Fig. 1

(a) Circuit and (b) suggested layout of a simple but useful R.F. probe.

pick-up coil, wound directly on the handle, consists of 8 turns of 26 S.W.G. insulated wire. A thin strip of the plastic sheeting (2¼ in. x ⅛ in.) is used as a former for the double wound R.F. choke. The number of turns on this choke is not critical and a double winding of 26 gauge wire, occupying

(Continued on Page 267)

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A COMPACT 7 Mc/s. V.F.O. UNIT

By ALAN G. DUNN (G3PL)*

ALTHOUGH many designs for variable frequency oscillators based on the Clapp circuit have been published, few differ greatly from the *QST* design(1) which first brought this oscillator to the attention of radio amateurs. Only two designs out of sixteen examined by the writer contained any reference to the use of the circuit on fundamental frequencies higher than the 3.5 Mc/s. amateur band.

The V.F.O. described here operates on 7 Mc/s., and may be followed by stages operating on the same frequency.

Circuit

A V.F.O. was required to operate on 7 Mc/s., without the need for a stabilised power supply. After poor results had been obtained from other circuits, the modified Clapp circuit shown in Fig. 1 was arrived at. In the usual circuit, the heater and cathode of the valve are at different R.F. potentials, which has always seemed a weak point. To avoid this difficulty the circuit of Fig. 1 has been arranged to permit of earthing the cathode.

The disadvantages of using the series capacitance for tuning purposes have been pointed out elsewhere(2). In the present design tuning is accomplished by a variable condenser in parallel with one of the fixed "tapping" capacitances. The screen of the valve acts as the anode of a triode oscillator, and the pentode anode is coupled to the grid of a cathode follower stage which provides good isolation from the succeeding stages.

High-slope pentodes perform best in the Clapp circuit, and although the most suitable valves in the octal range are the 6AG7 and the 6AC7, the type chosen was the 6SH7, as it was desired to economise in heater current consumption.

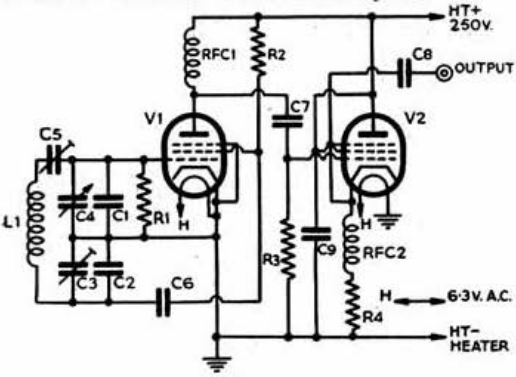

Fig. 1
Compact 7 Mc/s. V.F.O. Unit.

Component values are as follows:—

C1, C2	250 $\mu\mu$F. silvered mica.
C3	20 $\mu\mu$F. air dielectric trimmer.
C4	100 $\mu\mu$F. miniature variable.
C5	60 $\mu\mu$F. air dielectric trimmer (2 x 30 $\mu\mu$F. in parallel)
C6	750 $\mu\mu$F. silvered mica.
C7	250 $\mu\mu$F. silvered mica.
C8	0.1 μF. paper tubular.
C9	0.01 μF. paper tubular.
R1	56,000 ohms ½-watt.
R2	56,000 ohms 1-watt.
R3	100,000 ohms ½-watt.
R4	100 ohms ½-watt.
RFC1, RFC2	*Eddystone* R.F. choke, type 1010.
V1, V2	6SH7 (The suppressor grid is internally connected to cathode in this valve, and there are two cathode pins. It is immaterial in this unit which pin is used as the cathode connection.)

* 79 Hayton Grove, Hull.

Construction

The construction of any V.F.O. should be rigid, both mechanically and electrically, and the frequency-determining circuit well screened from outside influences. This is particularly important if any of the following stages are to operate at the same frequency as the V.F.O.

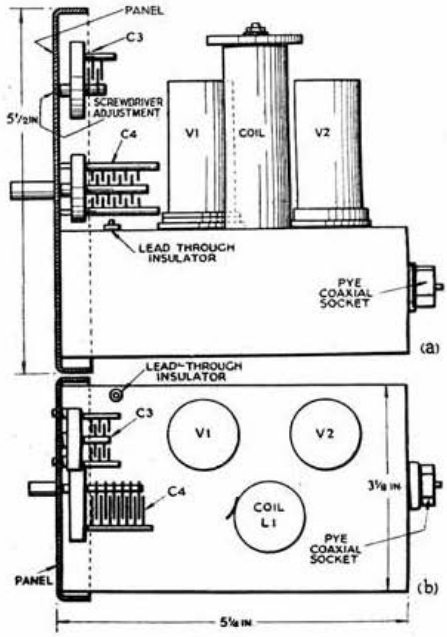

Fig. 2
Suggested Layout of Chassis: (a) Side elevation; (b) Plan.

A suitable midget chassis, complete with panel and a well-fitting cover, was found in the shape of a BC-357 marker beacon receiver, from which all components, with the exception of the two valve-holders and a 20 $\mu\mu$F air-dielectric trimmer mounted near the top of the panel, were stripped. The trimmer (C3) is used for final setting of the calibration. The valve-holder nearest to the panel is used for the oscillator stage. Fig. 2 shows the arrangement of the main components.

The tuning condenser is of the midget, air-dielectric, ceramic-insulated type. All tuned circuit components are mounted above the chassis and the remainder of the wiring below it. A small lead-through insulator, already present in the BC-357, is used to bring the grid connection through the chassis.

The coil is wound on a 2⅜in. length of 1in. ceramic former, and consists of 36 turns of 24 gauge D.S.C. wire, close wound. The wire was stretched before winding, and wound as tightly as possible. Coil formers of plastic material should not be used. The inductance is 20 μH.

The former is clamped to the chassis by means of a length of 2BA rod, which passes through a small piece of perspex. The perspex which is 1¼in. square and ¼in. thick, is clamped with a nut and washer to the top end of the coil former and is sufficiently flexible to permit the nuts on each end of the rod to be tightened without risk of cracking the ceramic former.

The series capacitance, C5, consists of two air-spaced trimmers in parallel giving a maximum capacity of 60 $\mu\mu$F. The actual value required is about 30$\mu\mu$F, but a greater value should be available for adjustment purposes. The fixed capacitors in the oscillator circuit should be of a good quality silvered mica type.

A two-conductor screened cable is used for the power supply lead. The metal braid is used for the earth and common return, *i.e.*, H.T. negative and the "earthy" side of the heater supply. One of the inner conductors is used for the H.T. positive and the other for the live heater supply lead. This cable is taken through a hole fitted with a rubber grommet, drilled in the panel near the bottom.

The output from the cathode of V2 is taken *via* C8 to the centre pin of a *Pye* co-axial socket mounted on the back drop of the chassis. A 1in. hole is cut in the screening cover to permit it to pass through. A 2½in. pointer knob is fitted to the spindle of C4, and is used with a card scale calibrated every 5 kc/s.

Adjustment

The trimmers forming C5 should be set to full capacity, as should C4, and the panel trimmer to half capacity. The oscillator will then operate on a frequency somewhat lower than 7 Mc/s., perhaps 6,500 kc/s. C5 should be reduced in capacity until the frequency, with the cover fitted and screwed up, can be adjusted to 7 Mc/s. by means of the panel trimmer C3. When the cover is fitted the oscillator frequency increases slightly; allowance must therefore be made for this when adjusting C5. The trimmers forming the latter should be sealed after adjustment to prevent accidental movement. At G3PL the lower frequency limit is set at 7002 kc/s. to make sure that off-band operation is impossible.

Performance

The frequency coverage of the original model (7002 to 7070 kc/s.) gives good coverage of the C.W. bands on 7 and 14 Mc/s. The frequency stability is excellent, and after a warming-up period of ten or fifteen minutes, any set frequency is maintained within 100 c/s. for periods of an hour or more. Stabilisation of the H.T. voltage is unnecessary and, when running from a 250 volt power pack of poor regulation, there is no frequency shift or chirp even when the voltage varies by as much as 20 per cent.

The output voltage is rather low, but a companion unit has been built, in another BC-357 box, which contains a 6AC7 resistance coupled amplifier stage driving a 6AG7 P.A. stage. The latter runs at 5 watts input from the same power pack, the output on 7 Mc/s. being 3½ watts. Using the 6AG7 as a frequency doubler, the input on 14 Mc/s. is also 5 watts, the output being about 1½ watts.

The complete transmitter was used for the 1950 N.F.D. event, when it proved to be really portable; the whole station, including receiver, power pack, key, 'phones, meters and other accessories was carried in a suitcase measuring 20in. x 12in. x 7in. The overall dimensions of the V.F.O. unit are 5½in. high, 3½in. wide and 6½in. deep.

References

(1) G. GRAMMER (W1DF), A High Stability Oscillator Circuit. *QST*, May, 1948, p. 42.

(2) A. G. DUNN (G3PL), Clapp or Colpitts? *R.S.G.B. Bulletin*, June, 1949, p. 304.

The article entitled "A Tuneable Oscillator of High Stability" by "Spenny," in the *R.S.G.B. Bulletin*, April, 1949, p. 245, also contains some useful information about this circuit.

THE FIRST TRANSATLANTIC SHORT-WAVE MESSAGE

ON December 11, 1921, the first complete twelve-word message ever to cross the Atlantic on "short waves" (230 metres) was successfully transmitted from 1BCG, a special amateur station erected at Greenwich, Connecticut, by the *Radio Club of America*. To commemorate this historic event a permanent granite memorial has now been erected near the site of the original station.

Old-timers will recall the excitement which surrounded the 1921 Transatlantic Tests. The first tests in 1920 had proved a failure, no American signals being definitely identified. For the winter of 1921 much more elaborate arrangements were made by A.R.R.L. and, on this side of the Atlantic, by Philip Coursey (2JK) on behalf of the R.S.G.B. (then the *Wireless Society of London*). On the American continent, transmitting stations were limited to those which had previously covered distances exceeding 1,000 miles; secret identification signals were allotted to all official stations. The Americans were dubious of the equipment then in use at British amateur stations and sent over Paul F. Godley with the latest types of U.S. equipment. Godley erected an elaborate station under canvas at Ardrossan, Scotland.

But British amateurs were not so far behind the times as their American colleagues had believed. While all credit must go to Godley for his outstanding work at Ardrossan, we can point with pride to the results of such British amateurs as W. R. Burne, 2KW, of Sale, Cheshire, who was almost certainly the first operator positively to identify American amateur signals (on the morning of December 8) and who heard altogether seven different Transatlantic stations, H. H. Whitefield, 2LG, R. D. Spence, 2JZ, and, of course, W. E. F. Corsham, 2UV, who is still active.

The tests culminated in the successful transmission by 1BCG (990 watts input) of the message "NR 1 DE 1BCG WORDS 12 NEW YORK, DECEMBER 11, 1921—TO PAUL GODLEY ARDROSSAN SCOTLAND — HEARTY CONGRATULATIONS — BURGHARD INMAN GINAN ARMSTRONG AMY CRONKHITE"; the signatures being the names of the six operators at 1BCG.

In addition to the dedication of the memorial, a special commemorative issue (October, 1950) of the *Proceedings of the Radio Club of America* contains photographs, reprinted articles, logs and technical descriptions of 1BCG and the Ardrossan station. While the account has been prepared largely from American sources, a facsimile of a letter from 2KW is reproduced. A limited number of copies is available from The Radio Club of America, Inc., 11 W. 42nd Street, New York City, price $1.00. This record should prove of absorbing interest to all who burned the DX oil in the early twenties and who were—in the phrase of the day—"hard-boiled owls."

Filament Transformers from surplus Smoothing Chokes

*By O. C. WELLS (G3FXE)**

THE 1500 c/s. chokes and transformers so common in ex-Government equipment are generally considered by the amateur as useful only for paper weights or door stops, unless completely rewound. In general, with mains transformers, more turns are required for the lower (50 c/s.) mains frequency. Similarly, smoothing chokes are of too low inductance, because smoothing is easier to carry out at the higher frequency. There is no reason, however, why a 1500 c/s. smoothing choke should not be used as the primary of a 50 c/s. mains transformer, leaving only the secondary winding to be added. Since the winding of several thousand turns of fine wire is not a job to be undertaken lightly without a coil-winding machine, and as the available winding space is in any case usually strictly limited, only the construction of a filament transformer will be considered.

The particular smoothing choke used by the writer has the reference number 10C/14695, and is found in a number of surplus indicator units and the like. It measures 2in. x 2½in. x 4in. high, is covered in bitumen, and has a terminal panel stamped with the reference number fixed on top.

Practical Details

The first step in the conversion is to remove all the bitumen and to separate the windings from the core. This is not so difficult as it might appear at first sight, because the core is very conveniently gapped, and comes apart in two sections. The wax in the core holds the laminations together and thus prevents them from scattering, a point which makes re-assembly easier. All that is necessary is to remove the four corner bolts and cut the two wires at the tag panel. There is little risk of damaging the windings in the de-tarring process as they are protected by an insulating layer. The only danger is that the end cheeks might become separated from the main bobbin, and care must be taken on this account.

There would appear to be about 2,300 turns on this particular type of choke, so that the secondary requires ten turns per volt output for a 230 volt mains supply. At G3FXE a 4 volt filament transformer to supply the cathode ray tube in an oscilloscope was needed. Forty turns of 18 S.W.G. wire were wound in two layers of 20 turns each. Brown gummed strip (1in. wide) was used for interleaving. The re-assembly is straightforward, the only difference being a new tag panel to take the extra two terminals.

In practice 18 S.W.G. wire is about the thickest that can be used on account of the restricted winding area, and so the output current is limited to two amperes. It was found that the magnetic field produced by the transformer when connected to the mains was extremely strong, necessitating magnetic screening of the C.R.T., as well as mounting the component 18 inches or so away from the tube. For this reason it is suggested that these transformers should be used only in power packs and such places where a strong external magnetic field is not objected to.

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Making Measurements

Other types of surplus chokes could probably be used in a similar manner, but those readers who wish to design their own should remember to make all their meaurements of output voltage *on load*, as the off load voltage is a little higher. The method of calculating the required number of turns is to wind on a trial winding of say ten turns of any size wire and measure the voltage across the ends with a suitable voltmeter. For this purpose the writer used an oscilloscope with a vertical amplifier, comparing the output with that from a commercial transformer. This is convenient because it permits the waveform to be checked for core saturation.

Several other uses for these chokes suggest themselves, such as output transformer primaries or transformers for quick-heating soldering guns. If any other reader has experimented along these lines it would be of general interest to know what success has been achieved.

The Founder's Cup

THE Council has accepted with grateful thanks a handsome silver cup—to be known as "The Founder's Cup"—which has been presented to the Society by Mr. Rene Klein, G8NK.

Mr. Rene Klein founded the Wireless Club of London in July, 1913, and became its first Honorary Secretary. It was from this Club that the present Radio Society of Great Britain sprang.

"The Founder's Cup" will be awarded annually to a member who, in the opinion of the Council, has rendered great service to the cause of Amateur Radio.

The first holder is Mr. Arthur E. Watts, G6UN (past President and Honorary Member), whose outstanding work as G.P.O. Liaison Officer over a period of many years has thus been so fittingly recognised.

An Electronic Keyer

ALTHOUGH many members have successfully constructed the electronic keyer described in the February, 1950, issue of the BULLETIN, a few have experienced difficulty in obtaining a suitable relay (A) for use in the anode circuit of V1. In the original article it was explained that the "High Speed" type of relay readily available on the surplus market was not recommended for this position since the break-operate time was too short. The P.O. relays specified usually require to be re-wound with a high resistance winding.

Mr. Peter Sawyer, formerly ZS5YF and G3BYF, who is now back in this country once more, points out, however, that if a standard midget smoothing choke is placed in series with the (A) relay winding, it will automatically provide the necessary delay. A high-speed type of relay can then be used without any ill-effect upon the performance of this popular keyer.

TRACING PARASITIC OSCILLATION

By T. W. WELCH (G3AYO)*

Power amplifier stages do not always work exactly "according to the book." Here is an account of how G3AYO traced unsatisfactory transmitter performance to an unsuspected V.H.F. parasitic oscillation. The detailed account of the symptoms noted and the tests carried out should prove of particular interest to members who have not previously encountered this common fault.

A CLASS-C R.F. power amplifier stage for operation on the 3.5. 7, 14 and 28 Mc/s. bands was recently constructed at G3AYO using the popular twin tetrode valve type 829B. The unit employs an orthodox push-pull circuit (see Fig. 1) with plate and screen modulation and is driven by a separate crystal controlled exciter. Frequency changing is carried out by means of plug-in coils with grid and tank circuits reasonably well screened so as to avoid the necessity of neutralising the 829B. All R.F. leads—particularly to R.F. by-pass condensers—are kept as short as possible.

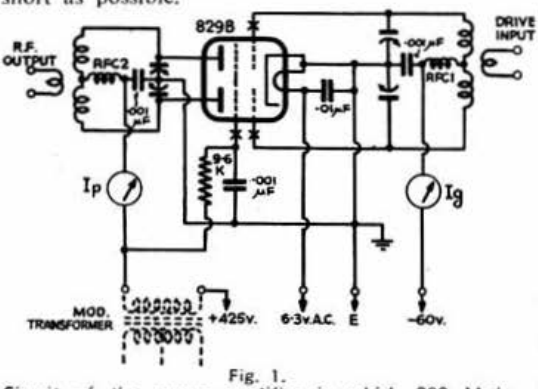


Fig. 1.
Circuit of the power amplifier in which 200 Mc/s. parasitic oscillation occurred. The fault was cured by inserting anti-parasitic devices at the points marked X.

When completed the amplifier was tested on all bands with reduced H.T. (about 300 volts) using a household electric lamp as a dummy load. The stage was found to behave normally, with all meter readings apparently correct and stable. No trace of self-oscillation, due to the absence of neutralisation, was observed. The tests were subsequently repeated with normal plate voltages when it was found that the P.A. delivered the expected R.F. output to both dummy loads and aerials.

Difficulties Arise

Immediately an attempt was made to modulate the carrier, however, the following effects were noticed:

(1) A roughness of speech-quality on all bands which could not be traced to any fault in the speech equipment.

(2) A slight upward kick of the plate current meter on all bands irrespective of audio power.

(3) On 28 Mc/s., an audio howl whenever the gain control on the speech amplifier was advanced more than a fraction above zero.

Effects (1) and (3) suggested, at first, that R.F. feedback into the speech amplifier was taking place. The usual grid-stoppers, R.F. chokes, by-pass condensers, etc., were added to the audio stages and the physical separation between this unit and the transmitter increased. These changes, however, completely failed to cure the faults.

Attention was therefore concentrated upon effect (2). Tests carried out with the aid of an absorption wavemeter fitted with a diode rectifier and a 500 μA. meter showed that the upward kick was due to carrier level shift. This suggested that the fault was due to either incorrect operating conditions of the valve or to parasitic oscillation.

The operating conditions were checked and found to be correct. This led inevitably to the suspicion that a parasitic oscillation was the cause of the trouble. To investigate this possibility, the drive to the power amplifier was removed, the modulation transformer shorted, the plate voltage reduced to 300, and the grid bias reduced until the stage was drawing approximately 25 mA. plate current. Under these conditions the following results were obtained:

(1) A very slight dip in the plate current was seen when the plate condenser passed through a certain setting.

(2) With a simple V.H.F. absorption wavemeter, a 200 Mc/s. oscillation was detected in the grid circuit at any setting of grid and plate condensers. When the grid condenser setting was varied, the amplitude, but not the frequency, of the parasitic changed. R.F. power at the same frequency could be detected in the plate circuit at any setting of the plate tank condenser, but with a well-defined peak amplitude when the tank condenser passed through the setting noted in (1).

(3) Similar results were obtained regardless of the coils used in the plate and grid circuits, and even when these were replaced by strips of copper braid.

(4) Oscillation could still be detected in the grid circuit when the two anode pins of the valve were strapped together with copper braid. It persisted when the stators of the grid condenser were shorted together, but disappeared when either of the grid pins was earthed with braid (momentarily, on account of the bias supply) or when the grid pins were connected together by braid *at the grid pins*. Oscillation also ceased if the screen voltage was removed or greatly reduced.

Careful consideration of these results showed that parasitic oscillation was almost certainly occurring between the grid and screen-grid electrodes of the valve, probably with resonant "lines" constituted by the wires connecting the grid pins to the grid condenser acting as frequency controlling elements. Since the 829B contains a 65 $\mu\mu$F. by-pass condenser embodied within the envelope to decouple the screen, this result was unexpected. It does, however, illustrate the extreme ease with which parasitic oscillation can occur, and also the fact that such a fault might not have been noticed if the transmitter had been used for C.W. operation only.

The Cure

Once the cause of the trouble had been traced, the cure proved simple. A 50-ohm carbon resistor was connected in the screen lead close to the valve pin. Two parasitic traps, each consisting of 20 turns of 24 S.W.G. enamelled wire wound on a 10,000-ohm carbon resistor, were placed in the grid leads, also close to the valve base. These alterations completely cured the trouble, and the amplifier is now giving good service.

* *The Hollies, Highcroft Road, Oadby, Leicester.*

TELEPHONY TRANSMITTER PERFORMANCE

• A simple explanation of the recommendations made at the I.A.R.U. Congress, Paris, 1950.

AT the I.A.R.U. Congress held last May in Paris, the Technical Committee regretfully came to the conclusion that too many amateur telephony transmissions (A3 and F3) are not of sufficient technical standard and for that reason they menace the good name of Amateur Radio. The Committee, therefore, proposed minimum technical standards, which in the view of the Technical Committee of the Society should be easily attainable.

The technical standards proposed are :

In order to limit the band-width occupied by an A3 transmission, a two-fold performance specification is recommended as follows :

(1) Limitation of the response of the A.F. equipment comprising the speech amplifier and modulator in such a way that when measured with a sine wave input the attenuation at 4 kc/s. should be 26 db. below that at 1 kc/s.

(2) A limit should be imposed to the total energy radiated outside a band of plus 10 kc/s. with reference to the carrier such that it cannot be detected with a receiver of adequate design located at a reasonable distance. *This limit does not apply to carrier frequency harmonics.*

It is well known that many telephony transmissions occupy an unreasonable space in the ether. Why is this ?

In the absence of distortion of any kind—*i.e.* the perfect transmitter—a band will be occupied either side of the carrier equal to that of the highest audio frequency employed for modulation: a listening test either side beyond this frequency, using a highly selective receiver, would reveal no signals of any kind from the transmitter.

It is evident that, irrespective of the transmitter employed, the range of radio frequencies occupied will depend on the highest audio frequency, and that, a limitation of this frequency will reduce the total band-width. Therefore, any proposal to limit this frequency on the long distance (DX) bands to some value which is only just sufficient for the conveyance of the essential intelligence is very desirable.

Transmitter Modulation Faults

Because, unfortunately, no transmitter is perfect, some difficulties can arise. For example there are several reasons why the spread of the side bands may be greater than that expected. The most significant of these are :

(a) Distortion in the A.F. amplifier causing frequencies higher than those present in the input to be generated as A.F. harmonics.

(b) Distortion in the modulator stage having a similar effect to (a) caused by overloading and mis-matching the valves.

(c) Over-modulation of the power amplifier causing harmonics to be generated in this stage, thereby distorting the carrier envelope.

(d) Distortion in the modulated stage having the same effect as in (c). This defect may be due to insufficient drive in the case of Class C amplifiers ; insufficient power handling capacity of the valve or valves ; or non-linear modulation in the case of Class B grid modulated stages, screen modulation or suppressor grid modulation.

(e) Spurious oscillation or parasitic oscillation in the modulator or modulated stage generating frequencies not present in the A.F. amplifier or in the carrier drive.

(f) R.F. feed-back from the transmitter into the A.F. amplifier producing severe distortion (apart from audible howling or motor-boating).

Attention to design will obviate (a), (b), (d), (e) and (f), while (c) is normally under the operator's control, provided adequate monitoring is used.

The first I.A.R.U. proposal—which is to limit the A.F. band-width—would be effective in regard to (a) and (b) and possibly—if a filter were placed between the modulator and modulated stages—to (e) and (f), but could have no effect upon (c) or (d).

The design of a filter for use after the modulator would require some care to prevent it from upsetting the impedance match between the modulator and the P.A., also to enable it to operate at a fairly high audio level (particularly when used with a 150-watt transmitter) since it would have to absorb all the output power at the higher frequencies. It would thus be most desirable to instal an additional filter *before* the modulator stage. An even more satisfactory solution would be to use a simple resistance-capacity filter in the A.F. amplifier, having a cut-off between 4 and 5 kc/s. and a loss of say 20 db, at 5 kc/s. with a second filter between the modulator and the P.A. having a slightly lower cut-off frequency and a loss such as to increase the overall figure to 26 db. at 4 kc/s. This arrangement is shown in Fig. 1.

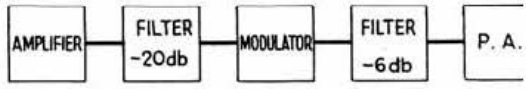


Fig. 1
Suggested disposition of filter elements.

The measurement of the performance of equipment incorporating such filters is quite simple, provided an audio oscillator of reasonable wave-form, covering 1 and 4 kc/s. is available. Alternatively a reasonably good pick-up and a constant-frequency record covering these frequencies can be used for this purpose.

Measuring Filter Performance

The measurement is performed by disconnecting the modulation transformer from the P.A. and terminating the secondary winding with a resistor of adequate size to dissipate the power output of the modulator. The value of this resistor is calculated by dividing the P.A. anode voltage by the P.A. anode current. This value holds true for anode modulation but should be slightly reduced where anode and screen modulation is employed. A rectifier type voltmeter, or a valve voltmeter, with a range of the order of, say, 100 volts, should be connected across the resistor. The internal resistance of the meter should be high when compared with the load resistor. If such a meter is not available a low range thermal milliammeter can be used in series with the load, provided the modulator has fairly high power output. With a 75 watt modulator and a load of 5000 ohms the maximum voltage would be 600

volts and the maximum series current 0.12 amperes. The testing circuit is shown in Fig. 2.

The next step is to connect the 1000 c/s. source. The gain control should then be advanced until a suitable meter reading is obtained, near full scale deflection. If the frequency is now changed to 4000 c/s without altering the input or the gain control the meter reading should fall to five per cent. of the previous reading for a 26 db. loss, and to less than five per cent. for a loss greater than 26 db. For example, if the original reading was

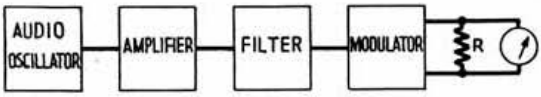


Fig. 2
Test Circuit for measuring filter performance.

80, the new reading should be four or less. Where the oscillator has a calibrated output control an alternative system of checking the filter performance would be to note the increase of input to the amplifier at 4 kc/s. required to obtain the same output meter reading as at 1 kc/s. This increase should be at least twenty times. Care should be taken, however, to ensure that the amplifier is not over-loaded when the larger input is applied.

From the foregoing remarks it is evident, firstly, that many stations do not possess the equipment to carry out such measurements and that secondly, even where such measurements are made there may still be excessive radiation outside the 4 kc/s band on either side of the carrier. The second I.A.R.U. recommendation is, therefore, more likely to be generally applicable, and covers all possible defects.

The recommendation itself clearly indicates how the test should be conducted; the band on either side of the carrier frequency should be carefully checked with a good communications receiver whilst normal speech is being transmitted. If no signal of any kind is heard more than 5 kc/s. on either side of the carrier all is in order. But since the signal strength, the sensitivity and selectivity of the receiver, the distance of the receiver from the transmitter, and the aerial characteristic may all materially affect the result, further consideration must be given to this point before a limit can be imposed, as indicated in (2).

Nevertheless, the criticism of the standard of transmissions need never have arisen if amateurs generally paid more care to the design of their transmitters, made adequate tests before attempting to engage in an orgy of DX, and always ran the apparatus and valves within their rated capabilities. Instead of the input and the depth of modulation being increased to achieve a signal 20 db. over S9, amateurs would find that 10 db. over S9 is still more than adequate! D.N.C.

• *G2SY, of Daventry, who has been a patient at St. Bartholomew's Hospital since last November, gratefully acknowledges the many kind Christmas and New Year wishes received from amateurs all over the world. He hopes to be home by the end of January.*

• *Mrs. J. Spencer, widow of the late G4HV, has ten bound volumes of QST (1939-49) for immediate disposal. Offers to 16 Keswick Gardens, Ruislip, Middlesex.*

• *QSL Sub-manager, G3BCK had a busy time in December. During one week alone he dispatched 3,682 cards in 356 envelopes.*

MORE ON THE T-CODE

THE suggestion that a revision of the "tone" section of the RST code is an urgent necessity —made by J. N. Walker, G5JU, in the November issue—has aroused a deal of comment. Most amateurs seem to agree that the tendency to use only the last three steps (T7, 8 and 9) of the present code has serious disadvantages, but opinion is by no means solidly behind the revised code as put forward in G5JU's letter.

For example, A.R.R.L. Communications Manager, F. E. Handy, W1BDI, believes that no change in the T-scale will bring about a cure of the basic trouble: the desire of so many amateurs to give unduly flattering reports. He believes that any attempt to incorporate such information as "drift" and "key-clicks" into the body of the code would make it much more difficult to memorise. The American view is that the present scale — plus "C," "X" or "K" to indicate "chirp," "crystal" or "clicks" and with the possible inclusion of "D" to indicate "drift"— is adequate; provided, of course, that amateurs could be persuaded to refer frequently to the *precise* meanings of the code and to give honest reports.

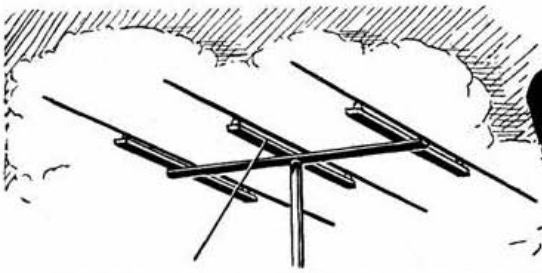
The question of "progressive" deterioration, as a particularly desirable feature of the code is also taken up by G8JD, who points out that if the new proposals were adopted, T6 "slight chirp" would be a better report than T7 "serious chirp," while the difficulty would also arise as how to report a drifting signal which has chirp and clicks, but not necessarily to a degree indicated by the proposed T0. '8JD casts his vote in favour of the present system, but asks for a more determined attitude towards its interpretation.

GM3CIX, on the other hand, is in favour of a revision, but also notes the slight inconsistencies in G5JU's scale. These, he suggests, could be overcome by minor rearrangement. His proposals are:

- T0 Note of the worst possible quality which should not be "airborne."
- T1 Severe A.C. ripple.
- T2 Serious steady drift.
- T3 Serious chirp ("twa-twit").
- T4 Broad "hard" signals, severe key clicks present.
- T5 Random, but slight drift.
- T6 Slight A.C. ripple.
- T7 Slight chirp.
- T8 Good clean signals, but spacer present.
- T9 Superb quality signals (to be used sparingly).

Unquestioned support for the G5JU code comes from G3HAT who further asks that it should be put into operation (at least for inter-G contacts) at the earliest possible moment (say March 1, 1951).

To sum up, it is obvious that considerable dissatisfaction exists at the paucity of information which can be gleaned from present tone reports; but whether revision, or a more sensible use of the present code, offers the better solution to the problem is still debatable. Meanwhile we should all endeavour to give honest reports and to make full use of the letters C, D, K and X to indicate chirp, drift, clicks and crystal notes.



AROUND THE V.H.F.'s

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

WITH the advent of the New Year our thoughts turn to what may be in store for us in 1951, as well as to take stock of what has been accomplished during the past twelve months.

Comparison of the "V.H.F. Achievements" table with that of a year ago shows considerable increase in the distances covered on the V.H.F. bands. For example, the spectacular way in which 70 centimetres has gone ahead reflects not only the effect of good propagational conditions during the past summer, but also the increasing interest being taken in the band and the strides that have been made in the efficiency of transmitters and —more particularly—receivers. In general 70 centimetres would appear to be in much the same state of development as was 5 metres in 1939, and with the greater fund of knowledge now available progress should be rapid in 1951.

Some French stations have modern equipment available, and an England/France 70 cm. contact by next summer is not unlikely. A year ago no one had worked—in fact it is doubtful whether more than one operator had heard—German two metre signals in this country, but a glance through these notes of a few months back will provide ample evidence of their frequent appearance in different parts of the country, often at surprising strength.

It is intended to recommence the two metre tests with Sweden and Finland next spring, and it is hoped that our friends in Denmark and possibly Norway may be persuaded to take part. Little is known of Danish two metre activity beyond the fact that short-haul contacts using S.E.O. transmitters and superregen. receivers were being made in one or two areas last year, and so far no news of Norwegian V.H.F. activity has come to our notice.

The outstanding British achievements on the 24, 13 and 3 cm. bands are too recent to require further comment here. Much has been done during 1950, and there is every reason to hope that the same rate of progress will continue to be recorded.

In nearly all spheres of amateur radio activity, spectacular DX becomes the yardstick of success, mainly because there is no other satisfactory criterion with which to judge our work except by those engaged in almost exactly similar research. This is unfortunate but true, and while it is a necessary part of radio journalism, tends to give the impression that distance records are the be all and end all of amateur achievement.

* 32 Earls Road, Tunbridge Wells, Kent.

V.H.F. Achievements

2 metres (144 Mc/s.)	W5VY—W8WXV	1,196 miles
	G2BMZ—DL4XS/3KE	520 miles
70 cm. (420 Mc/s.)	W6VIX/6—W6ZRN/6	261 miles
	W1PBB—W2QED / G5BY—G6LK	161 miles
23 cm. (1,215 Mc/s.)	G8DD/P—G3QC/P	75 miles
13 cm. (2,300 Mc/s.)	W6IFE/6—W6ET/6	150 miles
3 cm. (10,000 Mc/s.)	G3APY/P—G3ENS/P	27 miles

What must not be overlooked is the more prosaic work which is going on all the time; resulting in improved aerial arrays, more sensitive and more stable receivers capable of bringing in signals closer and closer to the noise level, and information compiled on V.H.F. propagation. In all these spheres the amateur has added considerably to the common fund of knowledge, though they seldom hit the headlines of popular appeal.

Two Metre Reports

Despite the recent poor conditions experienced on the band, G3DIV/A (Eastbourne, Sx.), found French stations coming in well on four days commencing December 20. At 2120 G.M.T. on the 20th, F8GH and F9AE (Paris Area) were worked on 'phone without difficulty, strengths being around S8 in each direction. F8MX (Paris) was contacted on the following evening at S4/5 on 'phone, with some fading present, while F8OB, to the north of Paris, was a steady RS58. F8GH, OB and 9AE were again worked by '3DIV/A on the 22nd., which appeared to mark the end of the good conditions, although several French stations were heard at rather low signal strengths on the 23rd.

In mid-December, G4FB (Tonbridge, Kent), who was working G6UH (Hayes, Middlesex) on two metres during the fade-out on the lower frequencies, noticed that signals from '6UH were rather stronger than usual, but suffered from a continuous rapid flutter, similar to aircraft interference effect, which lasted throughout the entire contact.

Mr. J. Spragg, G3APY, seen operating the combined 3 and 23 cm. equipment which helped bring the world's amateur 3 cm. record to the United Kingdom. On October 22, 1950, with the gear mounted atop of a saloon car, G3APY/P made two-way contact with G3ENS/P over a distance of 27 miles. Separate 5-element Yagi aerials are used for transmission and reception on 23 cm. with a wave-guide fed dipole and 18in. parabolic reflector on 3 cm.

Good conditions from November 26 to December 9 were experienced by G3EHY ; a number of stations in the London area, and in Lancashire, were worked without difficulty from his Somerset address. With the colder weather which followed, however, ranges fell to approximately 100 miles, although the subsequent reduction of activity made it difficult to assess conditions accurately. Later, from December 16 to 22, several useful openings occurred, and with the rise in evening temperatures on the 19th, a good 'phone contact was made with G8SB who, having moved from Horwich, is now situated in flat country a few miles south of Manchester. The nightly sked. with GW2ADZ at 100 miles was unaffected by the low temperatures and generally wintry conditions existing over this difficult path. Other signals reported by '3EHY include G2DCI (Liverpool), G3GHI (Purley, Sy.), G3ECA (Ilford) and G8ML (Cheltenham).

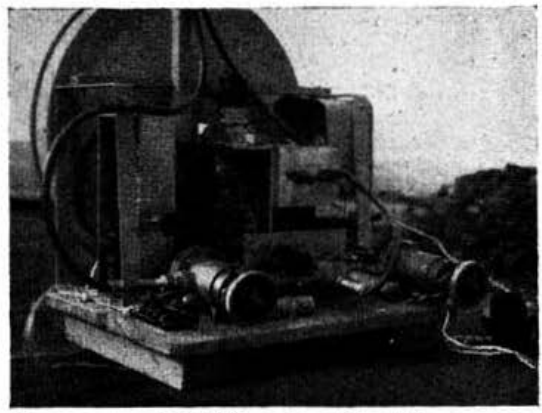
Commenting on the recent article in *QST* (see "Around the V.H.F.'s" November) on the prediction of two metre openings, GW2ADZ suggests that as the air mass in a depression or anti-cyclone is almost invariably moving irrespective of its circulation around its own centre, the line of optimum propagation for ducting is not strictly along the line of the isobars but at an angle to them, the angle depending upon the speed at which the whole system is moving and upon the wind velocity. As the systems move from west to east, the general tendency is for results to be better in an east-west direction than in north-south direction. As it is normal for an air mass to be more stable the further south one goes, it is implied that, with a weather system common to the whole country, better propagation is to be expected in the south and south-west of the U.K. rather than in the north or in Scotland. This theory seems to be borne out by results to date ; with the striking exception that G12FHN still holds, with G3BLP, the inter-G DX record. On the other hand, the governing factor may be the greater activity in the southern part of the country as compared with Scotland and the north.

Two Metre 'Phone Transmissions

Referring to our remarks in the September issue regarding 'phone transmissions on two metres, G6YP (London, S.E.5.), states that in his view far too many transmissions are *overmodulated*, and quotes the instance of a station over 10 miles from him who regularly spreads more than 100 kc/s. '6YP employs speech clipping set at 90 per cent. in the negative direction and 120 per cent. in the positive, and occasionally has reports of low modulation !

G6LX (East Croydon) is surprised that G3EHY, in the November issue, advocates plenty of "top" for long distance working, and points out that such practice can lead, should over-modulation take place, to widespread interference. He feels that there is still a lack of understanding of the fundamental theory of modulation, despite the ample information available on the subject. 'LX advocates some form of speech clipping, with appropriate filters, so as to make maximum use of available modulation without causing unnecessary side-band interference. Attention should also be paid to the transmitter to ensure that instability does not occur on modulation peaks.

Incidentally we have never been able to understand why narrow-band F.M. or phase modulation is forbidden on the unshared two metre band, while permitted on the shared band of 70 cm. and on certain lower frequencies. We feel that there are many amateurs who would welcome the opportunity of experimenting with these systems on two metres rather than, for example, on the crowded 28 Mc/s. band.



Close-up view of G3APY's combined 3 and 23 cm. equipment which uses frequency modulated CV90 oscillators on each band. A common I.F.—discriminator—A.F. unit is used for reception on both bands.

70 Centimetres

G2QY (Pinner, Middlesex) has been maintaining skeds. with G2DD, 3HBW and 8SM. At least one of these stations is active every evening between 7 and 7.30 p.m. and again after 10.30 p.m., and on Sundays around 10.30 a.m. Frequencies are : G2DD 436.16, 2QY 435.1, 3HBW 434.1 or 437.7 and 8SM 435.7 Mc/s. '2QY would like to see a "70 cm. Hour" once a week, and suggests Thursdays from 2100 to 2200 G.M.T.

G2CIW (Romford, Essex) has been heard, likewise G5CD, whose new transmitter puts a terrific signal into Pinner, but attempts to attract their attention have so far failed.

Before putting out a CQ, or when calling a weak station, '2QY and '3FP leave their carriers running for a minute or so or send a series of long dashes to attract attention, as it is thought that a steady signal is easier to find than one which is keyed normally. '2QY also reports that a push-pull crystal mixer gives an improved signal to noise ratio as compared with a single crystal.

* * *

Please send notes for inclusion in the February issue, together with reports on the 70 cm. "Activity Week," to G2UJ, 32 Earls Road, Tunbridge Wells, Kent, not later than January 22.

THE 1950 420 Mc/s. TESTS

THE report of the first 420 Mc/s. Tests, held in 1949, records a "decisive step forward" in amateur U.H.F. activity and achievements.

The 1950 results may, at first sight, appear as an anti-climax. The number of entries is lower than last year. Maximum distances covered are also lower. However, an examination of the equipment used and of conditions on the day of the Tests may well account for some of the differences. The weather was most unkind, with gales and heavy rain in most parts of the country. Hence the number of portable stations in operation has dropped. A further reason for a decreasing number of portables active is the increased complexity of the apparatus used. It is significant, however, that the ranges obtained in 1950 from home locations compare favourably with most of those achieved in 1949 from better sites.

AWARDS

Council has approved the recommendation of the Contests Committee to award the Arthur Watts Trophy to Messrs. Newton, G2FKZ; Knott, G3CU and Stone, G3FZL for their combined entry, and to award Certificates for meritorious entries to Messrs. Collett, G3BUR and Anderson, G2QY.

The most noticeable difference between the two "Tests" lies in the equipment used. In 1949, stabilised transmitters were noteworthy, only 20 per cent. of the entrants using them, whereas in 1950 only three operators used self-excited oscillators, and all of these were at locations away from home. But for the difficulty of transporting the more complex gear, this number would have been further reduced.

Similarly, the super-regenerative receiver has completely disappeared from the lists. About 25 per cent. of the 1949 entrants were using them. Stabilised local oscillators are becoming more popular. Clearly, they require a good deal of careful work to avoid numerous spurious responses, but the advantages of a receiver with accurate frequency calibration and capable of giving a genuine report on the tone of a signal are worthy of attention.

Comments

Probably little was learned from the Tests regarding propagation. Weather conditions were unfavourable for tropospheric bending, and at least the great majority of contacts were "line of sight." Schedules had been made with four Dutch stations by G2FKZ/P and G3FZL/A, but no results were obtained.

G3BUR/P, G4LU and GW2ADZ relate a curious experience. GW2ADZ and G4LU are located about a mile apart, on opposite sides of the border, and about 50 miles from G3BUR/P. They were both receiving a strong signal from him, but whereas G3BUR/P reported G4LU at R5 S9, he could not hear GW2ADZ at all. Both G4LU and GW2ADZ were using 832 triplers with about the same power. The aerial at G4LU was indoors!

Several entrants suggest prior publication of locations and types of emission to be employed. In 1949 a list of entrants was published, but owing to the difficulties in the printing trade it was not practicable to do so this time. The unavoidable delay in the publication of these results is also much regretted.

Equipment

(a) **Transmitters**

(i) *Stabilised.*

832 tripler: G3COJ, G4LU, G6HD, G8LY, GW2ADZ.
832A tripler: G2QY/P.
CV53 PA: G3APY/P, G8JI.
CV53 tripler: G4CG.
CV53 doubler: G2RD, G3BUR/P.
4 CV53's parallel-push-push doubler: G2FKZ/P.
ME 1003 PA: G3FZL/A.
All the above transmitters were crystal controlled, with the exception of G6HD, who used a VFO on 6 Mc/s.

(ii) *Self Excited.*

Push-pull CV82 oscillator: G2WS/A.
CV82 oscillator: G3FRG/P.
CV88 oscillator: G8QY/P.

(b) **Receivers**

The great majority of receivers used were home-constructed. Exceptions were the 1294 and ASB8 used by G2RD, the modified P58 at G3APY/P and the modified ASB8 at G3BUR/P.

R.F. stages were used by G2FKZ/P and G3FLZ/A (CV88), G3APY/P and G8QY/P (446A) and G3COJ (6J4). Most of the local oscillators used a 6J6 as oscillator and multiplier. Crystal-controlled injection was used by G2FKZ/P, G3COJ, G3FZL/A and G8LY. Mixers were generally crystals, CV102, CV103 and 1N22, but a diode was used by G8QY/P, and push-pull diodes by G8JI. The I.F. used varied from about 5 Mc/s. to 50 Mc/s.

(c) **Aerials**

Stacked arrays were most popular, varying from eight to 24 elements, with or without mesh reflectors. Five stations used Yagis and one a corner reflector.

Comparisons were made between Yagis and stacks by some stations. Results favoured the stacks. This would be due, at least in part, to the larger capture area of the stacked arrays.

Entries

Call.	*Location.*	*Height A.S.L.*	*Stns. wkd.*	*Stns. heard only.*	*Approx. max. dist. (miles).*
G2FKZ/P	One Tree Hill, London, S.E.	300	7	1(?)	43
G2RD	Wallington, Sy.		3	—	40
G2QY/P	1m. E. Princes Risborough.	813	1	3	61
G2WS/A	London, W.1.	100	4	—	7
G3APY/P	3m. W. Ambergate, Derbysh.	1034	3	—	53
G3BUR/P	Walton Hill, Worcs.	1036	4	—	60
G3COJ	Hull, Yorks.		—	1	(65)
G3FRG/P	6m. NNE. Worthing.	650	—	—	—
G3FZL/A	Dulwich, London, S.E.	180	8	—	42
G4CG	Wimbledon, Sy.	60	6	1	40
G4LU	Pant, Salop.		2	—	50
G6HD	Beckenham.	130	2	2	4
G8JI	Northfield, Birmingham.		1	—	6
G8LY	Lee-on-Solent.	22	1	—	13
G8QY/P	2m. NE. Meriden, Warwicks.		3	1	61
GW2ADZ	Llanymynech, Montgomerys.		1	1	1

Other stations reported active: G2CIW, G2DD, G3AOK/A, G3EJL, G4AP, G5DT, G5RW, G5TP.

MOBILE OPERATION

DEAR SIR,—The excellent article in the November, 1950, issue of the BULLETIN on "Mobile Operation" raises a number of interesting points.

Everyone who served in armoured or mobile formations during the war will remember the many problems of mobile operation which the fixed station never experiences.

The problem of vehicle suppression alone is one of great interest. It is not enough to suppress the ignition system of the vehicle. The "bonding" of the chassis, and of the chassis to the engine and to the body are matters of great importance in mobile communications. Further, it is usually found necessary to suppress the charging system, the windscreen wipers, and even the petrol pumps. Perhaps the most difficult part of suppression is, even after all these precautions have been taken, to locate the illusive noises and crackles which still seem to occur.

Then there is the art of timing transmissions when moving through towns or under railway bridges, etc., and especially the art of making the most of the few minutes when passing over high ground.

Then again there is the art of keying whilst on the move.

Perhaps one of the reasons why the G.P.O. will not permit mobile operation is the fear of the danger on the roads of vehicles being driven by people whose attention is on the radio transmitter and not on the road. This danger could, however, be removed by laying down quite clearly in the mobile licence that the operator of the set may NEVER be the same person as the driver when the vehicle is on the move.

Your article also raises the very important point of the defence aspect of mobile operation, and points out that the U.S. and Canadian administrations have appreciated this point more than our authorities. This, unfortunately, is true not only of mobile operation but of Amateur Radio in general.

It has always seemed to me that Amateur Radio is very excellent preparation for war, and that its value falls under two quite separate headings.

1. Training

The amateur radio operator acquires in peace time a knowledge of radio communications and he becomes to some extent proficient at:

(a) Locating and repairing faults as they occur.
(b) Erecting aerials, calculating their length, etc.
(c) Zero beating his transmitter to an incoming signal.
(d) Copying messages ('phone or C.W.) through heavy interference.

All these attributes, I found, by practical experience, are only acquired by army signal operators after a long period of training, and then often very imperfectly.

All this training which the Radio Amateur acquires costs the taxpayer nothing (in fact, the amateur pays a licence fee) and is acquired in the amateur's own time.

This, in my opinion, is a much more useful training than the drills and parades of the Territorial Army, for which the taxpayer has to pay.

The United States, by their encouragement of Amateur Radio, began the last war with a large body of—at least—partially trained radio technicians and operators, which it took us in Great Britain years to build up. And be it remembered that this vast army of radio technicians were trained in peace-time at no cost to the nation.

Amateurs in Richmond, Yorkshire, gathered together for the first time as a group on November 29th. Among those present were G3GSK (ex-VE3ATU), G3DUG (ex-VU2DG), G3DUR (ex-VP6NW-VP4TF) all now stationed at Catterick Camp. Also present were G2FO, 2CKN, 2HNL (the T.R.), 3BQJ, 3CDM, 3DLQ, 3DMK, 3FCB, 3GEJ, 3GJ, 5QU, 5XT, 6DR and 8IA. *Photo: A. J. Glover*

2. Production of Equipment

Owing to the large number of American radio amateurs there was already in peace-time a considerable market for communications equipment, both transmitters and receivers. This enabled several large American firms to manufacture (on a mass production basis) transmitters of all types, from small portable and mobile stations to the larger and now well known half-kilowatt transmitter later known as the BC610.

This means that at the outbreak of a war the United States has immediately available considerable stocks of communication equipment, and firms already tooled-up and *in production* of apparatus which needs little or no modification for military purposes.

The situation in this country is entirely different. Apart from the limited annual production of marine radio equipment and occasional orders for Government fixed stations and some small army orders, there is no demand for communications equipment which would justify any manufacturer tooling-up for mass production of transmitters. Thus, at the outbreak of war, firms manufacturing broadcast receivers must be converted to manufacture communications equipment, for which, of course, they are not equipped. In many cases in the last war the designing of sets did not begin until after the outbreak of hostilities. The Radio Industry certainly did a magnificent job in converting to war production, but at what a disadvantage do we labour compared to a country whose peace-time amateurs create the demand, the market, and, in some cases, the design of the equipment so much needed in war. And all this service is performed by the amateurs at no expense to the nation. So, I would ask:

Why not permit Mobile Operation?

Why not permit passing of third-party messages?

Why restrict portable operation to a mere 10 miles radius?

Yours faithfully,

EDGAR M. WAGNER (G3BID)

London, N.W.3.

By T. FENTON (ZD9AA) and E. R. COOK

THE STORY

Tristan

The operating position at ZD9AA and the official station ZHP, 1949-50. In this view two CR100 receivers are seen beside the remote control panel for the transmitters.

TRAVEL 2,000 miles west from the Cape of Good Hope or 4,000 miles north-east from Cape Horn and you will come to a tiny group of islands, standing in proud loneliness amid the vast expanse of the South Atlantic. Chief of these is Tristan da Cunha, an extinct volcano of 21 miles base circumference and rising to almost 7,000 ft. above the surrounding ocean. Few of its acres are cultivated, but there are apple and peach trees, some wiry sheep, bullocks and geese . . . and plenty of fish. Here live, to a ripe old age, a growing community of some 250 of the most isolated subjects of H.M. King George VI.

During the last war the vital need for meteorological information caused unfamiliar packages of radio equipment to reach those rocky shores. In 1942 the island was commissioned as *H.M.S. Atlantic Isle*, and became an important radio and meteorological station. With the end of hostilities traditional silence fell once more on Tristan. But not for long. . . .

In 1946 the decision was taken to reopen the station for meteorological purposes, with staff to be provided by the Department of Transport of the Union of South Africa.

This station (ZHP) was manned by personnel of the Aeradio Branch, and was used to pass meteorological traffic to the Capetown Aeradio station ZTF.

Towards the end of 1947, a proposal was put forward to "Official Quarters" by ZS6BT (Ted Cook, ex-G6UO), who is employed in the Aeradio Branch, that permission to operate an amateur station would add considerably to the meagre amenities of the island. (Was '6BT thinking of his colleagues on the island or did he want to work a new country ?)

The Licence

Higher Authority not only agreed, but also gave permission for the official equipment to be used, subject to an appropriate licence being obtained. The radio staff due to go out to Tristan at the end of 1947 (Bert Mobey and Roy Blount) were full of enthusiasm for the idea, and a letter was duly despatched to the P.M.G., London — licensing authority for the island—before their departure. Many discussions were held regarding amateur procedure, while it was arranged that a short signal *via* ZTF and ZHP would bring their station on to the air if the G.P.O. said "Yes."

In May, 1948, a letter was received from London agreeing to grant the South African Secretary for Transport a *free* licence with power input sufficient to allow one of the official 400-watt transmitters to be employed, provided the station was operated by an employee of the Department who had the requisite radio and telegraphic ability. Who said the G.P.O. had no heart!

So on May 4, 1948, at 16.30 G.M.T., ZD9AA made its first call—addressed to ZS6BT. Regular skeds were immediately arranged with this station and these continued until the day ZD9AA closed down. Many were the amateurs who listened to those skeds and climbed on the "band-waggon" as they finished ; not to mention the impatient ones who could not wait but attempted to wreck the contacts—getting themselves on the black-list in the process.

The QSL Situation

Soon another problem arose. The original QSL address for ZD9AA was c/o ZS6BT, and from June to December, 1948, the QSL's poured in *but could not be cleared*. Few overseas amateurs appeared to realise that in 1948 there was only *one mail per year* to the island, and that it had left before the licence arrived! The next mail was January, 1949.

Meantime, with QSL's choking the mail-routes to Johannesburg, Bert Mobey and ZS6BT got busy designing a QSL card by radio. The design completed, the cards duly arrived on the island in January, 1949—together with a new operator—Red Fenton—and his bride. So the first QSL's *arrived* in January, 1949, but the ship had to leave again almost immediately (incidentally carrying Roy Blount) and the next mail was not until June, 1949. Many incoming cards said "Pse QSL Airmail"—indicating a surprising lack of geographical knowledge and ability to read Morse, since the message "No QSL's till next mail in June" became a stock phrase.

The QSL position was therefore acute—plenty of cards but no mail-boat and no airmail facilities. This situation soon came to the ears of the R.S.G.B. QSL Manager, Arthur Milne, G2MI, who took appropriate steps to remedy the trouble. ZS6BT had already sent copies of the ZD9AA card to both R.S.G.B. and A.R.R.L. and '2MI promptly had copies made. Thereafter came into being the "QSL Skeds" (G2MI/ZD9AA) during which the Tristan station passed details of QSO's in a specially prearranged form, thus enabling '2MI to send out the cards as soon as the incoming QSL was received.

Those Behind the Key

Who were the men behind the key at ZD9AA ? There were three of them altogether: Bert Mobey (radio mechanician with a fist like a telegraphist), who operated the station from May, 1948, to September, 1949 ; radio operators Roy Blount (who operated once in a while from May, 1948, to January, 1949), and "Red" Fenton (who worked from January, 1949, to the closure of the station in February, 1950). "Red" was responsible for most of the contacts from about April, 1949, due to Bert being on the sick list. One should also not overlook Mrs. Red Fenton, but for whose tolerance hundreds of amateurs would have lost the chance to work a new country, and—later—the Junior Op. (born on the island), who kept her company when the DX gang kept the O.M. far beyond his dinner time!

(ZS6BT)

OF ZD9AA da Cunha

The Station Itself

Now for details of the station itself. The transmitter set aside for amateur use was a 400-watt job running a pair of 813's in parallel in the final. The oscillator was a Hartley circuit using a 6J5, driving a 6V6 isolator stage, followed by an 802 doubler. This transmitter was made in Capetown during the war—further comments are unnecessary for those who heard the note. Once it suddenly went T8, but before the operator could find what had gone wrong it lapsed back to normal T2 and stayed that way!

Two of the operators who put Tristan da Cunha on the Amateur Radio map: Red Fenton (left) and Bert Mobey. In the background can be seen the dour outline of this mountainous and lonely island.

The receivers were a *Marconi* CR.100—"Red's stand-by"—and a *Hallicrafters* SX.28, favoured by Bert. The aerials were two long-wire *Marconi* "L" type with 85 ft. top and 60 ft. high. The two were in line, running N.N.E./S.S.W. (like one long wire split in the centre), and the feeders came off the centre of the line. Break-in was always available, using one aerial on the transmitter and the other on the receiver. For skeds (particularly those with ZS6BT) it proved invaluable.

Power Problems

One of the most important (and least understood) items of equipment was the power supply. Amateurs who begged for a QSO after the "CL" may have wondered why ZD9AA did not stay just a little longer. The answer was generally "run-down batteries."

The power-system was as follows: A *Lister* diesel engine driving a 110 V. 23 kVA. D.C. generator was used to charge a bank of *Edison* cells. The cells were arranged in 110 V. banks, switched parallel for charging and series for working. These cells, in turn, were used to drive a 5 kW. motor-alternator giving 220 V. single-phase 50-cycle supply which fed the transmitter and SX.28. (The CR.100 ran direct from the batteries.) The power plant had to supply ZHP for all its working and woe betide any operator who let the amateur station run down the batteries before ZHP was off the air! The emergency domestic lighting also came off the batteries. There were times when the batteries failed and ZD9AA had to close without saying "Goodnight."

Those in VK and ZL who battled in vain to read ZD9AA should remember that Tristan is to a great extent an extinct volcano—rising to 6,760 ft.—and the station was at the base on the northern side. Signals to the south were therefore completely screened, and the screening eastwards was sufficient to prevent effective communication with Oceania.

A few remarks about schedules may be of interest. One of the main skeds was with G2MI on Monday nights, and these seldom failed. An even more difficult one was ZS1DZ and ZS1BK on Tuesday nights, and this ran for nine months on 7 Mc/s. without a miss. G5BZ managed a fair average of 14 Mc/s. contacts on Saturday nights, except when a contest made the band untenable for sked working. There was also the "Inside Info" sked with ZS6BT each Monday, which kept the boys well informed on matters of interest!

Did you ever hear ZD9AA on phone? The 12-watts input to a *Marconi* CNY.1 mobile transceiver on 7 Mc/s. (Red Fenton at the mike) was heard in ZE. Admittedly it was not used very often, but the facility was there when required.

ZD9AA closed down when the *Tristan Development Corporation* undertook to maintain the station ZHP. For the time being there is no ZD9AA, but—*quién sabe?*

HELP US . . .

- *When writing to Headquarters do not include* BULLETIN *items, queries, changes of address and publication orders, etc., on the same sheet of paper. Only one envelope is necessary, but a separate sheet for each subject please.*
- *Always print, or write clearly, your full name and address. Christian names, call-signs and illegible signatures cause much unnecessary checking.*
- *Notify Headquarters of impending changes of address several weeks before you move. Alterations to subscription reminders, etc., are not sufficient unless definite instructions are given. Include your B.R.S. number and/or call-sign, your present address and, if possible, the date your subscription falls due. Remember that* BULLETIN *wrappers are prepared up to a fortnight before the publication date.*
- *Please pay your subscriptions* promptly *when due. Failure to do so may result in the loss of valuable issues of the* BULLETIN: *high costs of production make it necessary to limit the number of extra copies printed each month.*
- *When forwarding your subscription renewal always return the reminder card sent to you from Headquarters, or, if this has been lost, indicate the date your subscription fell due.*
- *Please send all QSL cards to Mr. A. O. Milne, G2MI, 29 Kechill Gardens, Hayes, Bromley, Kent, and not to Headquarters.*
- *The Society is seldom able to supply information on ex-Government equipment except in the form of* BULLETIN *articles.*

. . . TO HELP YOU!

THE MONTH ON THE AIR

*By A. O. MILNE (G2MI)**

Listener Reports

IT is regrettable but true that an unduly high proportion of listener reports are of practically no value whatsoever to the recipients. This subject is of special concern to amateurs (particularly those using telephony) located in comparatively "rare" countries who regularly receive hundreds of unsolicited cards. For example, VS2CP in a recent letter frankly admits that he has ceased replying to many S.W.L.'s. The majority of the reports, he laments, are on the lines of "Heard you call CQ, RST569, pse QSL direct."

It should be the accepted rule that if a listener wants a QSL card he must be prepared to earn it by giving useful information. Guidance on what to report and whom to report to has been frequently published: give detailed information on a series of transmissions rather than single calls, include careful comparison strength and flutter reports on other signals from the same direction, report to stations who do not appear to be making regular two-way contact with the U.K. Simple rules such as these, if followed, will also mean far fewer unanswered cards; only the confirmed "non-QSL" station will ignore a really useful report. Take a tip from the leading exponents of careful listening: B.E.R.S. 195, for instance, would not have "all zones" in his QSL album if he had not consistently provided valuable reports. Similarly, we are glad to say, there is a respectable number of British listeners who maintain a very high standard of reporting. What some can do, others can copy.

New Year Resolutions

- ✱ I will never deliberately break into other people's DX contacts.
- ✱ I will never ask for a QSL unless I am prepared to send one in exchange.
- ✱ I will always give genuine and helpful reports.
- ✱ I will never use excessive power.
- ✱ I will endeavour to eliminate poor quality signals, over-modulation, splatter, key-clicks, drift and "squishy" signals.
- ✱ I will strive at all times to uphold the prestige of Amateur Radio by my conduct on the air.

Signed,
A. HAM.

January 1, 1951.

Conditions

In general during December, conditions were what can only be described as patchy. One day the band would produce only a few European signals and the next afternoon it would provide an opportunity to work W5's and W0's the "long way round." On the twenty-first the band suddenly opened up for Central and North America about mid-day and W2GT, VP7NM and VO3X were worked in quick succession at S9 plus. Australians have been worked over the short path at 1400 one day and S9 at 1600 the next day, while a VU would pop up amid a welter of SM's and I's only to disappear after a few moments. From 1700 to 2000 G.M.T., VQ2, ZE and ZS have been fairly consistent at low signal strength just workable on a very noisy band. A loud steady hiss has developed each evening about 1700 G.M.T., but odd South American, Central American and even W stations have come through for a few minutes, sometimes at great strength, only to fade out again before they could be contacted.

G6RH's list for the month includes FB8ZZ, 14010. FY7YB, 14020. CR5AC, 14010. CR5AD, 14060. ZS2MI (Marion Is.), 14055 and 14015. ZS8MK, 14030. 9S4AR, 14080. VP8AP, 14040. VK1PG, 14015.

Bob Pybus reports a quiet month on 28 Mc/s. The only interesting signal was KS4AC. On 7 Mc/s. his best were CT3AN, EA8AZ and EA9AI, and on 3.5 Mc/s. DL3NY was heard calling MD2JH at 2330 on Christmas night, but the latter was not heard to reply.

BRS16857 of Yeovil has also paid a good deal of attention to 7 Mc/s. He has heard CT2AE working HB9GJ on 'phone (7018 kc/s.). Here are a few frequencies and times: VE1BB, 7020 at 2015; 4X4BX, 7008 at 2008; KP4HU, 7010 at 2015; KP4KD, 7008 at 2115; EA9BB, 7014 at 2300; and CM2SW, 7020 at 0115.

BRS14237 is another devotee of 7 Mc/s. and has copied 25-PY's and also HZ1KE, 4X4, HK4AM, LU, CX4AT, CE6AX and UO5KAA.

G5KT of Bristol has been giving 3.5 Mc/s. a run during the past month with excellent results. Contacts were made with W1, 2, 3, 4 and 9, VE1, VO4AD, VO4H, VP6CDI, KP4HU and FA8RJ. He has heard TI2PZ, an unidentified YI3, and has worked 31 countries and eight zones so far on this band. W4BRB says look for EA0AB (3510), ZK2AB (3533), YN1AA (3525), also ZM6AK, VP5FR and VS7KR, frequencies unknown.

Best for A1084 of Wick, on 3.5 Mc/s., were 9S4AR, 9S4AX, IS1AHK, LX1ST, W1, 2, 3, 4, 5, 8, 9, VE1, 2, 3, ZL1ON, ZL1HM, ZL4IE, ZL3NE, VK5KO and KP4CC.

A1084 has had a letter from LA7KA stating that LA amateurs are not licensed for 1.8 Mc/s. On this band he has heard UA1AA, UA3KLA, UA3IS, UA4FC, HA5BK/1 on C.W. and UA3IS on 'phone. Best time seems to be about 1800 G.M.T. on 1800 kc/s.; the Russian stations are active most evenings.

Notes and News

Of the Worked All America certificates so far issued, G6RH holds "all-world" No. 6 and is the No. 1 Great Britain holder. G2PL holds No. 17 and G6YQ, No. 19. G2MI has 41 of the necessary 45 with some really sticky ones to get to make up the missing four. G6KC is reported to be the first British amateur to qualify for the "Maritime Mobile" certificate.

G2BJY, for so long a low-power man, has at last launched out with 150 watts. Before doing so, he made his 150th country and the necessary contacts for E.DX.C., no mean achievement.

We have received a telegram from VP8AP which reads as follows: "Cards VP8AP to Brown, Base H, Falkland Islands Dependencies, Survey Port Stanley Falklands. Despatch in bulk every October. Thanks." So there you have it. No use sending a follow-up card each month asking for QSL by air-mail!

A card from G5RI quotes ZS6BT as saying that "Red" Fenton left for ZD9AA again on December 29.

"Butch" Orrell, MT2E, has left Tripoli and hopes soon to be on the air from Aden. MT2BFC has also left. There are now no more MT's. 'BFC, however, has made a welcome reappearance

* *29 Kechill Gardens, Hayes, Bromley, Kent.*

as VQ6BFC in Hargeisa, British Somaliland. He will be on 'phone around 14200 kc/s., and has dealt with all QSL's to date from MT2. He is the only VQ6 on the air at present and will QSL 100 per cent. He hopes to be there for a year.

A packet of cards has just arrived from ZS7C; G6UT and G5VT inform us that ZS7D is to start up shortly, probably on C.W.

Charles Albury, VP7NM, the Bahamas QSL manager, has sent in a list of licensed VP7 stations. They are NG, H, J, L, M, N, R and U. VP7NQ, who is with B.O.A.C., is now back in England.

'NM complains of the clash between the S.S.A. sponsored contest and the A.R.R.L. sweepstakes. When all North America started calling CQ, SS., he just had to pack up and go to bed!

CT3AA, the QSL manager in Madeira, states that both CT3AF and CT3MB are pirates. W4NLY, ex-KZ5AY, is at an R.A.F. station in southern England. He has some KZ cards with him if anybody missed his original one. G2DHV has just received his card from F8EX, ex-FQ8WB. Can anyone please give the present QTH of VU2LR?

BRS14237 has a card from 3V8AV in Fezzan. He says this is a separate part of Libya under French military rule and issues its own stamps. What about a new country?

ZD6JL is another one from Nyasaland and QSL'S 100 per cent. He is at Zomba and is on the look out for G stations. G5LN says many KH6's often hear and call Europeans without result. Keep a look out for them and remember that their signals come from a few degrees west of the North Pole.

Personal Note

Once again the writer, and Mrs. Milne, wish to thank the several hundred members and radio amateurs throughout the world who so kindly sent them Christmas and New Year cards.

Family and personal illness has limited the time available for the compilation of these notes this month, and we must ask the indulgence of readers for any shortcomings which may have resulted.

LONDON MEMBERS' LUNCHEON CLUB

THE Christmas meeting of the Club was marked by the presentation of a gavel and base by Stanley Vanstone, G2AYC (President of the Sutton and Cheam Radio Society). Hand-made, by a craftsman who has been associated with Mr. Vanstone's company for more than 60 years, the gavel carries a suitably engraved silver plate to commemorate the occasion of the presentation.

The gavel was accepted on behalf of the Club by the Chairman (Kenneth Alford, G2DX), who had the support or some 30 members and guests, including Miss May Gadsden.

Members are reminded that the Club will meet at the Kingsley Hotel, Bloomsbury Way (opposite Headquarters) at 12.30 p.m. on the following Fridays during 1951:

January 19, February 16, March 16, April 20, May 18, June 15, July 20, August 17, September 20, October 19, November 16, December 20.

The Secretary of the Club is W. E. F. Corsham, G2UV, 143 Abbotts Drive, Wembley, Middlesex, who will be glad to hear from prospective members.

Contests Diary

From	*G.M.T.*	*To*	*G.M.T.*	*Contest*
Jan. 20	0001	Jan. 21	2400	S.A.R.L. DX Contest (C.W.)
Jan. 20	2100	Jan. 21	0800	R.S.G.B. Top Band Contest
Jan. 27	0001	Jan. 28	2400	S.A.R.L. DX Contest ('phone)
Feb. 3	1700	Feb. 4	1700	B.E.R.U. Contest ('phone)
Feb. 10	0001	Feb. 11	2400	A.R.R.L. DX Contest (C.W.)
Feb. 17	0001	Feb. 18	2400	A.R.R.L. DX Contest ('phone)
Feb. 24	1700	Feb. 25	1700	B.E.R.U. Contest (C.W.)
Mar. 3	1700	Mar. 4	1700	B.E.R.U. Contest (C.W.)
Mar. 10	0001	Mar. 11	2400	A.R.R.L. DX Contest (C.W.)
Mar. 17	0001	Mar. 18	2400	A.R.R.L. DX Contest ('phone)

B.E.R.U. Telephony Contest

Are you all set for the second B.E.R.U. 'phone contest? The single 24-hour contest period starts at 1700 G.M.T. on February 3, 1951. Operation is limited to 14 and 28 Mc/s. For full details of serial numbers, zones and rules see Page 180 of the November, 1950, issue of the BULLETIN. Remind Commonwealth amateurs of this contest during the next few weeks!

A.R.R.L. DX Contest

RULES for the 1951 A.R.R.L. International DX Competition are practically the same as those for last year, except for the following clarifications: crossband working is now specially prohibited (this will presumably prevent U.K. stations on 28 Mc/s. from working American stations on 27 Mc/s.); VO stations now count as an extra Canadian district, making 19 possible American call areas (W0-W9, VE1-VE8 and VO); logs submitted are the property of the A.R.R.L. and cannot be returned. As in 1950, the three-figure number to be added to the report should consist of the power input, and may be changed for different bands or when the input is varied. Object for U.K. amateurs is to work as many stations as possible in the 19 American call areas with 3 points for each completed contact (2 points on receiving acknowledgement of a number sent, 1 point upon acknowledging a number received). Scores are multiplied by the total number of American licensing areas worked, counting each area once on each band. A certificate will be awarded to the 'phone and C.W. winners in each country (only single-operator stations eligible for these awards). Full details of the contest together with the format for entries are published in the January, 1951, issue of *QST*.

S.A.R.L. DX Contest

THE 1951 S.A.R.L. International DX Contest will consist of two 48-hour periods: one for telegraphy and one for telephony. Operation will be restricted to the 7, 14 and 28 Mc/s. bands and cross-band working is not permitted. Object for non-African stations is to work as many ZS stations and districts as possible. Serial numbers to be exchanged will consist of the report plus three figures which will change with each contact: for the first contact send any three figures; for the second contact use the three figures received during the preceding contact; and so on. Five points are scored for each complete contact, with a multiplier consisting of the total number of ZS districts worked on all bands. For times see Contests Diary.

Entries must reach the Contest Committee, P.O. Box 3911, Cape Town, South Africa, not later than April 30, 1951, and must include the following declaration: *I hereby declare that my station was operated strictly in accordance with the conditions and rules of this Contest, and I agree to abide by the decision of the Chairman in the event of dispute.* Log sheets should show name, address and call-sign; date and time of contact (G.M.T.); band; call-sign of station worked; number sent; number received; ZS district; points claimed. An analysis sheet must also show total number of districts worked, number of contacts, points claimed and number of bands used. Certificates will be awarded to the leading scorers in each country provided they are members of I.A.R.U. societies.

Rules for the TOP BAND CONTEST on January 20, 1951, will be similar to those published on Page 146 of the October, 1950, issue. (Logs to be posted on or before January 29, 1951.)

QUA

AMATEURS puzzled by the continued use of the **21 Mc/s. band** by certain overseas stations —including amateurs in Southern Rhodesia—will be interested to learn that, in official eyes, this is purely a matter for the local administrations concerned. As Southern Rhodesia is a signatory to the Atlantic City Convention, the authorities in other Commonwealth countries are unlikely, we learn, to intervene provided no interference is caused to their own services operating in accordance with the regulations. This raises an interesting question: if no such interference is being caused by amateurs already operating in the band, why need *our* authorities wait for the seemingly remote general agreement before releasing the band?

Interesting phenomenon reported from the North of England by **G3BRA.** Whilst listening to transmissions from a **meteorological balloon** just outside the 28 Mc/s. band, slight frequency modulation was noticed whenever the characteristic audio note was being radiated. Careful adjustment of the B.F.O. producing surprising results: the balloon was undoubtedly calling CQ! Further investigation resulted in snatches of a QSO and several other CQ's being logged with at least one callsign—G8PB of Cambridge — identified. Suggested explanation is that the balloon aerial was resonating at approximately the frequency of amateur stations in the locality and passing the signals to the grid of the self-excited oscillator. 'BRA suggests that here is a chance for the back-room boys to produce wide-coverage T.V. signals from the stratosphere!

The recent low values of **solar activity**—reflected in the poor conditions on 28 Mc/s.—were apparently to some extent unexpected. The *Radio Research Board*, which prepares the monthly prediction charts, recently issued a warning that its forecasts of critical frequencies and maximum usable frequencies should be reduced by 20 per cent. in December, 15 per cent. in January and 10 per cent. in February. A new H.M.S.O. publication, by the way, is "Radio Research, 1933-1948" (price 2s.). It includes details of the first year's work—reported by the Director, **Dr. R. L. Smith Rose**—of the Radio Research Organisation set up at the end of 1947 and a survey of the radio investigations conducted over a period of fourteen years by the D.S.I.R. The present research programme includes an investigation of the communication possibilities on micro-wavelengths.

The December issue of *QST* names all recipients —up to October 15, 1950—of the post-war **DX Century Club** award. British stations figure reasonably well in the list with some 130 general and 26 telephony awards. G2PL with 226 countries is fourth in the general list, ten countries behind the leader, W1FH. Other U.K. stations with scores above the 150 mark include G6ZO (216), G6RH (215), G2EC (181), G8KP (173), G8IG (171), G4CP (167), G3DO (164), G2FSR (160), GW3ZV (160), G2MI (153), GM3AVA (151) and G2VD (150). W1FH is also top of the 'phone table with 195 confirmed countries; leading U.K. representative is again G2PL sharing 11th place with 166 countries credited. Other listings in this table include G2ZB (150), G6RH (150), G8IG (144), G3DO (143) and GM3AVA (141).

The R.E.F. **technical lectures** (see QUA, October, 1950) are now being broadcast in English by F9IL (Thursday, 1330 G.M.T., 7140 kc/s.) and F9DW (Thursdays, 2330 G.M.T., 3700 kc/s.).

Since 1928 the Slade Radio Society has encouraged D/F activities amongst its members. At the recent dinner, Mr. C. N. Smart (who also gained first place in the 1950 R.S.G.B. D/F. Tests) was presented with the Harcourt Trophy by the Society's Chairman, Mr. W. E. Chilvers. Also in the photograph are the well-known D/F enthusiasts, Messrs. N. B. Simmonds, J. A. Walley, C. H. Young (G2AK) and S. J. Phillips.

B.B.C. television engineers face a bleak future—at least those chosen to maintain the new **Holme Moss,** North of England, television station now scheduled to commence operation in mid-1951. The site—over 1,700 feet above sea level—is the most remote and lonely spot yet chosen for any B.B.C. station. A month's supply of food is to be stored against the possibility of the station becoming snowed up! Brief details of the station, which has strong similarities to Sutton Coldfield, include: 750-foot mast; 35 kW vision transmitter on 51.75 Mc/s.; 12 kW sound transmitter on 48.25 Mc/s. V.H.F. slot aerials will be incorporated into the mast for possible future high-fidelity broadcasting.

Many Amateur Radio enthusiasts have made

Ten Minute Quiz

A pot-pourri of questions for the radio amateur.

1. *What is Methyl Methacrylic Ester?*
2. *What is the peak inverse voltage per valve in a single phase full wave rectifier in terms of the direct voltage output?*
3. *What are "A0," "A1" and "A5" signals?*
4. *What callsign prefix should be used by an amateur station in (a) Bangkok; (b) Salisbury; (c) San Juan; and (d) Dar-es-Salaam?*
5. *What is the more usual name for a meter with a "D'Arsonval" movement?*
6. *What is "permeability"?*
7. *What should be the maximum length of an amateur transmission?*
8. *What is the effective or R.M.S. value of an alternating voltage (sine wave-form) with a peak value of 100 volts?*
9. *What is the speed of sound in air?*
10. *To whom could you disclose the existence and contents of a message received from a commercial radio station?*

Now turn to page 267 and see whether you have beaten the Question Master.—H.E.B.

press headlines—but few have done so at the age of 14 years. Junior Associate, **Graham King** of East Molesey, Surrey, however, recently received a four-column write-up in his local paper after he had won the annual receiving award of the Kingston and District Radio Society. Graham, it appears, has been dabbling in matters electrical since he was three, and at the age of eleven joined the R.S.G.B. and really settled down to short-wave reception.

A tip for the V.H.F. enthusiast: watch the progress of **overtone crystal oscillators.** Circuits are now being developed which give a useful output as high as 150 Mc/s. from a 10 Mc/s. crystal. Not only should these developments eliminate strings of multiplier stages in V.H.F. equipment but should also do much to banish T.V.I. complaints of radiation at lower frequencies. Technique involves shunting the crystal with proper value of inductance and tuning the plate tank to the desired overtone frequency. A practical circuit is given in the November issue of *Electronics* for a 77 Mc/s. output from an 8.55 Mc/s. crystal shunted with a .15 μH. inductance. With a 6AK5 valve the arrangement is stated to give 0.3 watts output with 150 volts on the plate.

Amateurs in the Japanese area are no longer permitted to use the 3.5 and 7 Mc/s. bands, states *QST*. For security reasons, 'phone "patches" (relay of amateur messages over the telephone system) are also now prohibited in Japan. . . . A group of Norwegian amateurs, with five stations on the air, handled several hundred emergency messages on behalf of the fire brigade, police and other officials when 320 acres of forest were ablaze. . . . The *Marconi Marine Co.* has purchased a 72-ft. screw diesel launch—Electra II—to be used as a floating radio laboratory. Many of the pioneer experiments on commercial short-wave radio were carried out in the original Electra. . . . New U.S. service equipment includes a 16 in. x 9 in. x 3 in. F.M. walkie-talkie weighing about 20 lb. with a range of five miles and a small handie-talkie, also F.M., with a range of about one mile. . . . LA4KA has obtained permission to carry out amateur television experiments. . . . 4,439 radio transmitters are now being used on U.S. railways. . . . More than one amateur will echo the sentiments of comedian Groucho Marx who says "I find television very educating. Every time somebody turns on the set I go into the other room and read a book."

Bevan Swift Memorial Lectures

SHORTLY after the death, on November 3, 1948, of the "Grand Old Man of British Amateur Radio"—Mr. H. Bevan Swift, A.M.I.E.E., G2TI—a Memorial Fund was inaugurated by the Society to perpetuate the name of this well-loved amateur. As a result over £130 was subscribed.

The Council has now decided that the most suitable method of achieving the object of the Fund is by the establishment of a Bevan Swift Memorial Lecture to be delivered annually, preferably during the month of November, at an Ordinary Meeting of the Society in London. The lecture will thus become a feature of the normal lecture programme of the winter season.

The Fund will be drawn upon to purchase a suitable silver medal for award to the lecturer who need not necessarily be a radio amateur but whose subject should relate to Amateur Radio. To assist in the selection of lecturers, it is to become a duty of the Technical Committee to recommend to the Council the names of suitable persons. The Council hopes that the first Bevan Swift Memorial Lecture, in November, 1951, will be given by someone personally acquainted with G2TI.

GUIDE TO DX CERTIFICATES

IN response to numerous requests for details of DX and proficiency certificates available to amateurs, the following brief summary of the major awards has been prepared. It should be noted that claims should always be accompanied by a list of the cards submitted.

A.A.A. — "All Africa Award" issued by the South African Radio League to amateurs submitting proof of post-war contacts with all ZS areas (ZS1—ZS9), plus at least 25 other countries on the continent of Africa. Minimum acceptable reports are RST338 and R3 S3. Telegraphy and telephony endorsements are made. Non-members' fee 2/6. All claims should be sent direct to: S.A.R.L., P.O. Box 3911, Cape Town, South Africa.

B.E.R.T.A.—"British Empire Radio Transmission Award" issued by the R.S.G.B. to amateurs submitting proof of contacts with 50 or more Commonwealth call areas. (A separate leaflet dealing with this and other R.S.G.B. certificates is available from H.Q.) Minimum acceptable reports are R3 and T8. Power declaration required. Telegraphy and telephony endorsements are made. Non-members fee 2/6. All claims should be sent by registered post to: R.S.G.B., New Ruskin House, 28/30 Little Russell Street, London, W.C.1.

D.U.F. — "Diplôme de l'Union Française" issued by Réseau Des Emitteurs Français in four separate categories. Requirements for European amateurs are: Contacts with stations in the French Union in at least (1) 5 different countries in 3 continents; (2) 8 countries in 4 continents; (3) 10 countries in 5 continents; and (4) 16 countries in 6 continents. At least one of the contacts must have been with a European country. The French Union includes French occupation areas (e.g. DL5, FZS, EZ, etc.). All contacts must have been made since April 1, 1946. Claims must be made through the National Society (*i.e.* R.S.G.B. in United Kingdom). Return postage required.

DX.C.C. — "DX Century Club" certificates issued by the American Radio Relay League to amateurs submitting proof of post-war contacts with 100 or more different countries as defined in the A.R.R.L. country list. Telegraphy and telephony endorsements are made. Additional endorsement stickers are issued in steps of 10 countries. Claims must be sent direct to: Communications Department, A.R.R.L., 38 La Salle Road, West Hartford 7, U.S.A. Return postage required.

E.DX.C.—"Empire DX Certificate" issued by R.S.G.B. to **members only.** 100 confirmations required, 50 from Commonwealth call areas contacted on 14 Mc/s., plus 50 from Commonwealth call areas contacted on other bands (see leaflet available from H.Q.). Minimum acceptable reports R3 and T8. Power declaration required. Telegraphy and telephony endorsements are made. Claims must be sent direct to R.S.G.B. Headquarters (see B.E.R.T.A.).

H.B.E. — "Heard British Empire" issued by R.S.G.B. to persons not holding a transmitting licence who submit evidence of having heard 50 or more Commonwealth call areas (see leaflet). Non-members fee 2/6. Claims must be sent direct to R.S.G.B. Headquarters (see B.E.R.T.A.).

The Empire DX Certificate—Premier DX award of the R.S.G.B.

Helvetia XXII issued by U.S.K.A. European amateurs must submit evidence of contacts with at least two stations in each of the 22 Swiss Cantons. All contacts must have been made since April 15, 1948. Claims must be sent direct to: U.S.K.A. Traffic Manager, c/o Postbox 1367, Berne, Switzerland.

W.A.A. — "Worked All America" issued by L.A.B.R.E. to amateurs submitting proof of post-war contacts with 45 or more different countries in the American area (North and South America). Minimum acceptable reports are R3 and T8. Claims must be sent by registered post direct to L.A.B.R.E. Headquarters, P.O. Box 2353, Rio de Janeiro, Brazil. Return postage required.

W.A.C.—"Worked All Continents" issued by the International Amateur Radio Union to amateurs submitting proof of contact with each of the (6) continents. Claimants must be members of their National Society through which claims should be made (R.S.G.B. in United Kingdom, etc.). Telegraphy and telephony endorsements are made.

W.A.CE.—"Worked All Chile" issued by the Radio Club of Chile to amateurs submitting proof of post-war contacts with each of the seven radio districts of Chile. Claims must be sent direct to: R.C.C., P.O. Box 761, Santiago, Chile.

W.A.E.—"Worked All Europe" issued by *QRV* magazine. Each European country counts as one point on each band below 30 Mc/s. and as two points on each band above 30 Mc/s. Total claimed score must exceed 100 points. Germany is listed as two countries: one for German nationals; the other for occupation personnel. All contacts must have been made since December 1, 1949. Telegraphy and telephony endorsements are made. Claims must be sent direct to: *QRV Radio Magazine*, Box 585, Stuttgart, Germany. At least three international reply coupons are required.

W.A.P.—"Worked All Pacific" issued by New Zealand Association of Radio Transmitters to amateurs submitting proof of post-war contacts with 30 or more countries in the Pacific Area. Minimum acceptable reports are R3 and T8. Claims must be sent direct to: N.Z.A.R.T. Head-

quarters, P.O. Box 105, Wanganui, New Zealand. Reply postage required.

W.A.S. — "Worked All States" issued by A.R.R.L. to amateurs submitting proof of contacts with each of the 48 continental United States. Claims must be submitted direct to A.R.R.L. (for address see DX.C.C.) with return postage.

W.A.SM. — "Worked All Sweden" issued by S.S.A. European amateurs must submit proof of at least two post-war contacts with each of the seven SM radio districts. Claims must be sent direct to: S.S.A., Stockholm 4, Sweden. Ten international reply coupons required.

W.A.VE.—"Worked All Canadian Provinces" issued by Canadian Amateur Radio Operators' Association to amateurs submitting proof of contacts with at least two different stations, on two different bands, in each of the nine Canadian Provinces (total 18). Contacts must have been made since January 1, 1939. Claims must be sent direct to: C.A.R.O.A. Headquarters, 46 St. George Street, Toronto 5, Canada, with 25 cents or equivalent.

W.A.Z.—"Worked All Zones" issued by *CQ* magazine to amateurs submitting proof of contacts with each of the 40 "zones" as devised by the editors of *Radio*. Full details can be obtained from *CQ* Editorial Offices, 342 Madison Avenue, New York 17, N.Y., U.S.A. Addressed envelope and reply coupon required.

W.B.E.—"Worked the British Empire" issued by R.S.G.B. to amateurs submitting proof of contacts with British Commonwealth stations in each of five continental areas (North and South America count as one area for this award). Telegraphy and telephony endorsements are made. Minimum acceptable reports are R3 and T8. Power declaration required. Non-members fee 2/6. Claims must be sent to R.S.G.B. Headquarters or through the National Society of the claimant.

W.E.A.—"Worked East Africa" issued by the Radio Society of East Africa to amateurs possessing five annual certificates plus proof of contact with VQ1. Annual certificates require contacts in any one year with one VQ3, one VQ5 and three VQ4 stations. Extracts from log entries will suffice. Claims for annual certificates should be sent direct to: R.S.E.A., P.O. Box 1246, Nairobi, Kenya Colony (annual certificate fee 5/-).

An award is issued by F.E.A.R.L. to amateurs submitting proof of contacts with at least seven out of the nine JA radio districts. Claims must be sent direct to F.E.A.R.L., A.P.O. 500, San Francisco, U.S.A. Return postage required.

* * *

Overseas societies and organisations issuing certificates not listed above are invited to send details to R.S.G.B. Headquarters.

Mr. J. P. Hawker Appointed Assistant Editor

MR. J. P. HAWKER, G3VA, who, for the past three years has been Assistant to the General Secretary, is now Assistant Editor of the R.S.G.B. BULLETIN.

Since paper rationing ended last year the size of the BULLETIN has increased considerably with the result that a great deal of extra work has fallen upon the Editorial staff and in particular upon Mr. Hawker. His new appointment recognises the importance of the work he has done and is doing in connection with the BULLETIN.

Ten Minute Quiz

Answers to the questions set on page 264.

1. Perspex.
2. 3.14 times the direct output voltage.
3. A0—continuous wave carrier with no keying or modulation.
   A1—keyed (on-off) continuous wave transmission.
   A5—amplitude modulated television.
4. (a) HS1 (Siam); (b) G or ZE (Salisbury, England, or Salisbury, Southern Rhodesia); (c) KP4 (Puerto Rico); and (d) VQ3 (Tanganyika).
5. Moving coil meter.
6. The measure of the ease with which magnetic lines of force can flow through a substance.
7. Ten consecutive minutes.
8. 70.7 volts.
9. Approximately 1,090 feet per second.
10. A duly authorised officer of H.M. Government or a competent legal tribunal.

Brighton T.V.I. Troubles

PROMPT action by Mr. R. T. Parsons, of the Brighton and District Radio Club, resulted in a retraction of the statement made on behalf of a local viewers' association and reported on the front page of a recent issue of the *Brighton and Hove Herald* that interference to television is "sometimes traced to the practice of amateurs operating transmitters on frequencies other than those allotted to them by the G.P.O." When challenged, the secretary of the association admitted that "we do not know of any instance where Amateur Radio transmitters operate outside their permitted band."

Some good, however, may come from this unfortunate episode as attempts are being made to bring about a meeting between members of the viewers' association and the Brighton Radio Club to discuss their respective technical difficulties. Misunderstandings of the amateur position can only be overcome by a more widespread knowledge of the true facts of T.V.I.

A HANDY R.F. PROBE

(Continued from page 249)

about 2 in. of the strip, should be found satisfactory. Coil dope should be applied to the choke and to the pick-up coil. Afterwards the choke is fixed to the reverse side of the handle, from which it is spaced by means of two brass nuts. The hand shield can consist of a further strip of plastic material fastened underneath the meter, and then bent at right angles to the main handle. Many plastics such as the clear acetates and methacrylates can easily be bent under the action of hot water.

This instrument is sensitive enough to indicate the presence of R.F. in receiver oscillator coils, as well as for innumerable transmitter adjustments such as neutralisation, checking standing waves on co-axial lines, tracing R.F. feedback into power lines, etc. Pick-up from a high power transmitter stage is sufficient to give full-scale deflection when the probe is held several feet from the tank circuit.

HEADQUARTERS CALLING

COUNCIL, 1951

President :
WILLIAM A. SCARR, M.A., G2WS.
Executive Vice-President : F. Charman, B.E.M., G6CJ.
Hon. Treasurer : A. J. H. Watson, F.S.A.A., G2YD.
Hon. Secretary : L. Cooper, G5LC
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, W. N. Craig, B.Sc., G6JJ, C. H. L. Edwards, A.M.I.E.E., G8TL, T. L. Herdman, B.A., A.M.I.R.E., G6HD, P. A. Thorogood, G4KD, P. W. Winsford, G4DC.

General Secretary : John Clarricoats, G6CL.

November Council Meeting

Résumé of the Minutes of a Meeting of the Council held at Headquarters on Tuesday, November 14, 1950.

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

Apology.—Apologies for absence were submitted on behalf of Messrs. A. P. G. Amos and V. M. Desmond.

Finance.

Resolved to accept and adopt the Balance Sheet for the quarter ended September 30, 1950, and the Cash Account for the month ended October 31, 1950, as submitted by the Hon. Treasurer.

Membership.

Resolved to approve :—
53 applications for Corporate Membership
19 applications for Associate Membership
2 applications for Junior Associate Membership
7 applications for transfer to Corporate Membership.

Affiliation.

Resolved to grant affiliation to the following Societies and Clubs :—
B.T.H. (Coventry) Social & Athletic Club (Radio & Television Section).
Eccles & District Radio Society.
Gateshead & District Amateur Radio Club.
North-West Kent Amateur Radio Society.

Council Elections.

Resolved to adopt the advice given by the Society's legal advisers in regard to the conduct of the forthcoming elections.

Czechoslovakia Peace Appeal.

A letter was submitted from the Czechoslovakian Amateur Radio Society (C.A.V.) requesting the Council to rescind its previous decision not to handle QSL cards which bear political matter.

Resolved to advise C.A.V. that the Council adheres to its previous decision not to distribute QSL cards bearing political matter.

Attention was drawn to an article published in the November 1950, issue of *The Short Wave Magazine*. The article contained translated extracts from one alleged to have been written by a Mr. A. Bergol, of Birmingham, the original of which it was alleged had appeared in the publication of the Czechoslovakian Amateur Radio Society (C.A.V.). The article contained a number of entirely false and mischievous statements concerning Amateur Radio conditions in Great Britain. It was reported that the author had been a member of the R.S.G.B. for six years but had relinquished his membership at the end of 1948.

The Secretary was instructed to bring the article to the notice of the Post Office.

Argentina and Falkland Islands Dependencies.

After receiving a confidential report from the Secretary it was resolved to publish a statement in the BULLETIN dealing with the operation of illegal amateur stations in the Falkland Islands Dependencies.

Mr. Milne tabled a large batch of QSL cards from Argentine amateurs all of which carried a map showing the Falkland Islands and the Falkland Islands Dependencies as Argentine territory.

After a lengthy discussion it was resolved that the cards in question, and those of a like type, should be returned to the Argentine Society with a statement to the effect that the R.S.G.B. is not prepared to accept cards bearing a map which represents British territories as being under the control of the Argentine Government.

Ministry of Transport.

It was reported that a further letter had been received from the Ministry of Transport to the effect that as existing arrangements for dealing with messages transmitted by radio from vessels in distress around the coasts of Great Britain are considered to be satisfactory, no useful purpose would be served by convening a meeting to discuss an agreed procedure for calling upon the assistance of radio amateurs in an emergency.

The Secretary stated that this letter, together with certain correspondence from the Post Office relating to the handling of maritime distress traffic by radio amateurs, was being considered by the Post Office Liaison Committee and that a report would be presented to the Council as soon as the Committee had completed its review of the position.

The Secretary reported that at the October meeting of the Bury R.S.G.B. Group a resolution was passed requesting the Council of the R.S.G.B. to press the Ministry of Transport to lay down a procedure whereby the services of radio amateurs could be called upon in an emergency. The T.R. had been instructed to bring the facts as set out in the Editorial of the September issue of the BULLETIN to the notice of the Member for Bury and Radcliffe (Mr. Walter Fletcher, M.P.). The Secretary stated that as soon as the resolution was received at Headquarters he sent an urgent request to the Bury T.R. asking him not to approach Mr. Fletcher for the time being. It was subsequently learnt that the Bury T.R. had in fact written to Mr. Fletcher immediately after the meeting. The Secretary stated that upon the receipt of this information he had advised the Bury T.R. that his action may have jeopardised the negotiations being undertaken by the Society.

Resolved to advise the Bury Group that the matter referred to in their recent resolution was still under consideration by the Council.

[A statement dealing with the action of the Bury Group appeared in the December issue.—ED.]

Amateur Television.

The Secretary reported that Mr. C. I. Orr-Ewing, M.P., had arranged for the President and himself to meet the Postmaster-General (the Rt. Hon. Ness Edwards, M.P.) privately in the House of Commons on November 16 to discuss Amateur Television with particular reference to the use of frequencies lower than those referred to by the P.M.G. in his recent announcement.

Festival of Britain.

After giving consideration to a further letter from the Festival Authorities it was resolved to support the proposals contained therein regarding the operation of an Amateur Radio station at the Land Travel Exhibition.

[This matter was reported upon in the December issue.]

1951 Convention Committee.

The Council received a report from the 1951 Convention Committee and agreed to accept and adopt the recommendations contained therein. The recommendations related to the production of a Convention film and to the purchase of raffle prizes.

Technical Committee.

The Council received a report from the Technical Committee and agreed to adopt the recommendations referred to therein. The recommendations related to rules for the Bevan Swift Memorial Lecture and to the postponement for at least two years of an earlier proposal to prepare a Third Edition of the Amateur Radio Handbook. In this latter connection it was reported that the decision of the Committee had been taken after considering a number of printing estimates and after receiving a statement from the Secretary regarding recent sales of R.S.G.B. and A.R.R.L. technical publications. It was further reported that the Committee had been unsuccessful in obtaining the services of a qualified person to undertake the editorship of the new work.

Arising from a consideration of the Report, the Secretary submitted an estimate from South London Press Ltd. for printing a booklet entitled "Television Interference." The estimate showed a considerable saving on that submitted by another firm of printers.

Resolved to accept the estimate and to place an order for 5,000 copies of the new publication.

Regional Representatives' Conference.

The Secretary submitted a Report of the Regional Representatives' Conference which took place on October 7, 1950.

Resolved to refer the recommendations which relate to finance to the Finance and Staff Committee for their consideration.

Resolved to accept and adopt the recommendations which relate to the staggering of the election of representatives.

The meeting terminated at 9.30 p.m.

REPRESENTATION

THE Council has agreed to authorise each Regional Representative to attend not more than three properly constituted meetings of R.S.G.B. members within the boundaries of his Region in any one year. The total claim made by any Regional Representative against the Society in respect of such visits must not exceed £10 in any one year. If private transport is employed the claim may not exceed the cost which would have been incurred if public transport had been employed.

REPRESENTATIVES

The following are additions or amendments to the list published in the February, 1950, issue of the R.S.G.B. Bulletin.

Regional Representative

Region 10 : F. Hamer, GW8BW, 7 Neath Road Bungalows, Rhigos, Nr. Aberdare. Telephone: Hirwaun 353.

County Representatives

Region 8 :
Berkshire.—F. Hill, G2FZI,* Cheriton, St. Mary's Road, Mortimer Common.
Hampshire.—L. J. Fitzgerald, G4QL, 27 Keydell Close, Horndean.

Town or Area Representatives

Region 1 : Cheshire :
Wirral.—B. O'Brien, G2AMV, 26 Coombe Road, Irby.
Region 2 : Northumberland :
Area of Stocksfield, Corbridge, Hexham & Haltwhistle.—J. G. Wardhaugh, G4LA,* 20 Hallgates, Hexham.
Region 3 : Staffordshire :
Stoke-on-Trent.—D. Poole, G3AQW,* 13 Oldfield Avenue, Norton-le-Moors.
Region 4 : Nottinghamshire :
Newark.—W. A. G. Davidson, G3EVG,* 96 Staunton Rd.
Region 7 : London North :
St. Albans.—A. Read, G4RO, Ottershaw, Upton Avenue.
London West :
Shepherds Bush & Kensington.—W. G. H. Robinson, G3EZM,* 38 Royal Crescent, W.11.
Region 8 : Berkshire :
Reading.—L. A. Hensford, G2BHS, 30 Boston Avenue.
Hampshire :
Southampton.—F. Russell, G3BHS, 11 Chestnut Avenue, Eastleigh.
Region 9 : Dorsetshire :
Poole.—A. E. Harvey, BRS.16,281,* Hillview, Curlieu Road, Oakdale.
Region 11 :
Wrexham.—G. Didcote, GW3BKP, 8 High Street, Coedpoeth.

* *New Appointments. Remainder elected to fill vacancies.*

Change of Address

Region 12—County Representative for Angus.
Should read : G. W. Robertson, GM3FEU, c/o Simpson, 26 Jeanfield Crescent, Forfar.

Region 10: Result of Election

The Ballot for the vacant office of Region 10 Representative resulted as follows:—

A. J. Crookes,	GW3ALV	19 votes
F. Hamer,	GW8BW	96 ,,

• *LOCAL REPRESENTATIVES NEED YOUR SUPPORT. GET IN TOUCH WITH THEM—IF YOU HAVE NOT ALREADY DONE SO : OFFER ANY ASSISTANCE POSSIBLE ; HELP BUILD UP AN ACTIVE LOCAL GROUP.*

Vacancies

The Council has received with regret the resignation of Dr. W. P. Cargill, G5LR, from the office of Region 9 Representative. Dr. Cargill's decision to resign has been forced upon him by increasing pressure of his professional duties as Deputy Chief Officer of the Health Department at Southampton.

Nominations for his successor should be made in the form prescribed in the September, 1949, issue of the BULLETIN, and should reach the General Secretary by January 31, 1951.

Messrs. G. Miles, G2CXO, M. I. Wilks, G3FSW, E. C. Sutton, G8IA, M. Tapson, G6IF, E. J. Williams, G2AKY, R. S. Head, G3FII; and Miss J. A. C. Rainie, GM3AKR, have resigned as Representatives for the district of South-East London, the area of South-East Manchester, the towns of Darlington, High Wycombe, Dagenham, Bath, and the area of Ayr and Prestwick respectively. Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1, by January 31, 1951.

LONDON MEETINGS

All meetings are held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2.

Friday, Jan. 26, 1951. **D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E. (G5CD).**
"EQUIPMENT FOR THE 420 Mc/s. BAND."

Friday, Feb. 23, 1951. **H. A. M. Clark, B.Sc. (Eng.), A.M.I.E.E. (G6OT).**
"POST-WAR DEVELOPMENTS IN TELEVISION."

Friday, March 30, 1951. **R. H. Hammans (G2IG).**
"HIGH SELECTIVITY 'PHONE RECEPTION."

Friday, April 27, 1951. **A. O. Milne (G2MI).**
"LOW POWER PORTABLE EQUIPMENT."

All Meetings commence at 6.30 p.m. Tea will be served from 5.30 p.m.

Readers are reminded that the meetings listed are open to all members of the Society.

Ballot for Coventry T.R. Vacancy

Messrs. L. Gardner, G5GR, and J. R. Tuck, G6YD, having been duly nominated for the vacant office of Town Representative for Coventry, it will be necessary to conduct a Ballot.

Corporate Members resident in Coventry are invited to record their vote in favour of one of the above candidates and to forward same on a *postcard* addressed to the General Secretary, Incorporated Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, by not later than January 31, 1951.

PRESCRIBED FORM OF VOTING CARD

I, ... being a fully paid-up Corporate Member of the Society and resident in Coventry, wish to record my vote in favour of Mr. ..... as Representative for the town of Coventry, Region 3.

Signed .....
Call-sign or B.R.S. .....
Address .....
.....

FORTHCOMING EVENTS

(Continued from page 243)

REGION 8

Brighton.—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Rd.
Eastbourne.—February 2, 7.30 p.m., Friends' Meeting House, Wish Road.
Chatham (M.A.T.R.S.).—Mondays, 7.30 p.m., Co-operative Hall, Luton Road.
Gillingham (G.T.S.).—Alternate Tuesdays, 7.30 p.m., Medway Technical College.
Petersfield.—January 18, 7.30 p.m., Y.W.C.A. Hostel, High Street.
Portsmouth.—Tuesdays, 7.30 p.m., Royal Marines Signal Club, Eastney Barracks.
Reading (R.R.S.).—January 27, February 8, Main Society; February 10, Instructional Section, 7 p.m., Abbey Gateway.
Southampton.—February 3, 7.30 p.m., 22 Anglesea Road Shirley.

REGION 9

Bristol.—January 19, February 16, 7 p.m., Keens Cafe, Park Row.
Exeter.—February 2, 7 p.m. Y.M.C.A., 41 St. David's Hill.
Gloucester.—Wednesdays, 7.30 p.m., Spread Eagle Hotel, Market Parade.
North Devon.—February 2, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.
Plymouth.—January 19, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Judes.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.
Torquay.—January 20, 7.30 p.m., Y.M.C.A., Castle Road.
West Cornwall (W.C.R.C.).—January 18, "Fifteen Balls," Penryn.
Weston-super-Mare.—February 6, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Rd.

REGION 14

Glasgow.—January 31, 7.30 p.m., 39 Elmbank Crescent.
Falkirk.—January 29, February 9, 7.30 p.m., Temperance Cafe, High Street.

• **Details of meetings should be forwarded to the appropriate REGIONAL REPRESENTATIVE not later than the 20th of the month preceding publication.**

AROUND THE REGIONS

Coventry

At the December meeting it was decided to nominate Mr. J. R. Tuck, G6TD, to fill the vacant position of T.R., and the Group's programme for 1951 was discussed. Several members have volunteered for duty at the Festival of Britain station at Birmingham. G5PP was congratulated on completing his Empire DX " double "—he now holds the 10th telephony award in addition to the 40th general award. The next meeting is on January 19.

East Surrey Radio Club

The Club recently staged a demonstration of Amateur Radio at a Hobbies Exhibition at Redhill, organised by the local Rotary Clubs. An amateur station, under the call-sign G5LK/A, was operated by local members. At the annual dinner in December, guests included Mr. and Mrs. Tommy Price and Mr. Clarke (G2AAN). The " Wilf Butler (G5LJ) Cup " was presented to G3CDG, winner of the Club's receiving contest. Meetings are held every fourth Thursday (February 1, etc.) at the Barn Room, 8 Lesbourne Road, Reigate.

Edgware and District Radio Society

Weekly (Wednesdays, 8 p.m.) meetings will in future be held at 22 Goodwin Avenue, Mill Hill, and not at St. Michael's School. Goodwin Avenue is almost opposite the Capitol Cinema, Mill Hill Broadway. R.S.G.B. members are cordially invited to attend.

Hampstead

The December meeting of the Hampstead Group took the form of a dinner and discussion at the Broadhurst Club. Plans were formulated for the 1951 programme, including monthly meetings and at least two dinners at which the emphasis will be on " rag-chewing." Visitors included G3CKX (West London D.R.), ZB1AX, G8KZ and G5GQ. Details of future meetings can be obtained from " Forthcoming Events " or direct from Mr. E. R. Cooper, G3GTH, 90 Hillfield Road, Hampstead, N.W.6.

Harrogate Radio Society

The Society has recently acquired fresh premises at the rear of 14 Union Street, where meetings are held on Wednesday evenings at 7.30 p.m. In addition a basic radio theory class is held on Friday evenings at 7.30 p.m. A full programme of lectures and film strips has been arranged for the New Year. New members and visitors are welcome at all meetings.

Hull and East Riding

The Hull and East Riding R.S.G.B. Group are holding their annual transmitting and receiving contest from 12.01 G.M.T., February 17, to 23.59 G.M.T., February 18. The contest covers all bands from 1.8 to 28 Mc/s. Full details may be obtained from the T.R., Mr. J. R. Borrill, 321 Priory Road, Hull, or from Messrs. Fanthorpe & Co., Hepworth Arcade, Hull.

Norman's Hamfest

The fourth of the popular " Hamfests " given by Mr. Norman Turner (G4NT) at Chiltern Works, High Wycombe, took place on December 3, when over 160 guests, many from far afield, were present. The afternoon opened with a talk on " Modern Developments in Pulse Modulation " by Mr. D. G. Holloway (G3DBX), of *British Telecommunications Research Ltd.*, who then continued with an illustrated description of the recently completed Liverpool Harbour V.H.F. installation. After an excellent tea Mr. Kenneth Alford (G2DX) expressed the appreciation of the visitors for the hospitality provided. Major Swartt (ZS1AX) also spoke of his pleasure in being present. A lantern lecture on " High Speed Photography " by Mr. G. T. Peck of *Ernest Turner Electrical Instrument Ltd.* was followed by the film " Airborne 1909," and the Lucky Draw which brought the evening to a close.

Oxford and District Amateur Radio Society

An unusual—and possibly unique—honour has been bestowed upon the Oxford and District Amateur Radio Society: the Proctors of the University having granted permission for its members to join the Society and for notices of Society activities to be posted in all Colleges as from next term. Mr. M. Swithinbank, G3FXY, of Pembroke College, has been appointed University Representative. When announcing this news, the President, Dr. A. M-M. Payne, stressed the importance of this recognition of a non-University society. Mr. B. Canning, BRS18107, was responsible for the negotiations with the University authorities. It is hoped that all students interested in Amateur Radio will take advantage of the facilities to be provided.

Peterborough

Keen interest in D/F work has resulted in three local contests, including one held in conjunction with the Spalding R.S.G.B. Group. Apart from these activities, attendance at the monthly meetings has been well maintained. Local funds benefited from the 10 per cent. deductions made at a successful junk sale recently. Negotiations are progressing to secure new H.Q. accommodation, and the Area Representative, Mr. L. Critchley, G3EEL, will circulate details of the next meeting.

Ravensbourne Amateur Radio Club

Membership of the Club has now reached 20. Meetings are held on Wednesdays and Thursdays (7 p.m.) at the Childeric Road School, New Cross, S.E.14, and include technical lectures and a Morse class. Chairman is Mr. G. Haylock, G2DHV.

South Manchester Radio Club

A monthly newsletter/magazine, which it is hoped will become a permanent feature of Club activities, has recently been inaugurated. The address of the Honorary Secretary is now Mr. E. Taylor, G3BVP, 12 Marton Avenue, Didsbury, Manchester 20. Mr. Taylor succeeds Mr. M. I. Wilks, G3FSW.

Stoke-on-Trent

A new R.S.G.B. Group has recently been formed to represent the districts of Stoke-on-Trent, Newcastle-u-Lyme, Leek, Cheadle, Stone, Stafford and Congleton. The objects will be to stimulate further interest in the activities of the R.S.G.B. and to encourage Amateur Radio generally in the district. The Chairman is Mr. W. H. Wilson, G2WN, and the Treasurer is Mr. G. Tagg, G8IX. Full information of the Group, which solicits the support of all local members, can be obtained from the Secretary: Mr. J. W. Nixon, G3CLP, 25 Albert Terrace, Scotia Road, Tunstall, Stoke-on-Trent.

[We feel it important to emphasise that R.S.G.B. Groups should be run by a properly elected T.R. who may, of course, appoint members to assist him. The R.S.G.B. scheme of representation does not recognise the offices of Chairman, Treasurer or Secretary of an R.S.G.B. Group.—ED.]

Stoke-on-Trent Amateur Radio Society

Call-sign of the club H.Q. station at the " Cottage Inn," Oakhill, is G3GBU and not G3GUB as recently stated. Meetings are held weekly (Thursdays 8 p.m.).

Sutton and Cheam Radio Society

Mr. Louis Varney, G5RV, lectured on " The design of a 50-watt TVI-proof transmitter " to a well-attended meeting on December 9. A modified V.F.O. version of the transmitter described in the July, 1950, issue of the BULLETIN was successfully demonstrated.

The Lincolnshire Hamfest, held last October, attracted 24 members to Spalding. From their expressions they found the journey well worth making !

Worthing and District Amateur Radio Club

The annual 7 Mc/s. receiving contest is being held on January 19-20 with a total contest period of two hours. The Corporation has now turned down a third application for sponsored QSL cards, but it is hoped that a local association will co-operate. Morse practice classes are held on Monday evenings.

Irish Radio Transmitters Society

The combined A.G.M. and Dinner of the I.R.T.S. will be held on January 20 at the Sherbourne Hotel, Dublin. Details can be obtained from the Honorary Secretary, Capt. A. C. Woods (EI3L), 17 Butterfield Crescent, Rathfarnham, Co. Dublin.

The Radio Society of East Africa

At the A.G.M., held in Nairobi on December 8, the retiring President, Mr. G. Duncan Fletcher, VQ4GDF, reviewed the Society's activities and achievements during the past year. Mr. S. A. Pegrume, VQ4CRE, who recently returned to East Africa after an extended visit to England, was elected President for the coming year, and Mr. E. J. A. Bryant, VQ4BRY elected Vice-President. Mr. E. Robson, VQ4ERR, probably East Africa's most widely known amateur, continues in office as QSL Manager. Mr. D. D. Grieve, VQ4BY, was re-elected Honorary Secretary and Treasurer.

The new Committee is busy on a programme of lectures, talks and social functions for 1951, and any East African residents who are interested in radio, particularly from the amateur point of view, will be made most welcome to Society meetings. Visiting amateurs are cordially invited to contact the Honorary Secretary, R.S.E.A., P.O. Box 5681, Nairobi, before or on arrival in East Africa.

LETTERS TO THE EDITOR

Polystyrene Preferred

DEAR SIR,—I should like to make one slight criticism of the transmitter described by G5RV in the July BULLETIN.

In the article P.V.C. covered wire is suggested for the link coils in the P.A. turret. The use of P.V.C. insulation in any R.F. circuit is not to be recommended as this material has a higher S.I.C. combined with a very much poorer power factor than Polystyrene, which I consider should be used. The characteristics of these two materials are not very widely published, and I therefore give them, together with those for Perspex, below:—

Material	*Frequency c/s.*	*Dielectric Constant*	*Power Factor*
Polystyrene	60	2.6	.0002
	10^4	2.6	.0002
	30×10^4	2.55	.0002
P.V.C. (Plasticised)	60	5 to 12	.03
	10^3	5 to 6	.04
	10^4	4 to 3	.06
Perspex	60	3.5	.07
	10^6	3.4	.05
	10×10^6	3.0	.02

It will be seen that whilst, with increasing frequency, the dielectric constant of P.V.C. approaches that of Polystyrene, its power factor gets rapidly worse.

If P.V.C. insulation is used in screened leads in the R.F. or I.F. circuits of a receiver, it will result in a serious loss of gain, whilst if any long lengths are used in the audio end, the high-frequency response will suffer, the latter due to the rising dielectric constant with reduction in frequency.

Incidentally, it will be seen from the above figures that Perspex is almost as bad as P.V.C. when used at H.F.

Yours faithfully,
W. GRIFFIN (G6FJ).

57 The Ridgeway, Chingford, E.4.

Ham Spirit Prevails

DEAR SIR,—It gives me great pleasure to affirm that the ham spirit still exists!

G8TN and I were returning by car from holiday when it broke down, late in the day, near Cambridge.

G2PU, who had been located by his super-aerial arrays, then overcame all difficulties by arranging with a friend in a nearby garage to work late on the repair—which included informing that man's wife, piloting us to the garage and entertaining us in the "local" whilst the work was being carried out; finally setting us safely on the road to London at 11 p.m.

Yours faithfully,
J. H. PAYTON, G2JB.

New Malden, Surrey.

International Goodwill

DEAR SIR,—Being back in my home-QTH, after a three-weeks' stay in your country, may I express my gratitude for the kind welcome I received, particularly from G6TQ, 2AOW, 5FA, 5JF and others. I do hope that all G's who visit my country will find the same true "Ham-spirit."

Yours sincerely,
HANS-CARL VON JORDANS (DL3GJ).

Bonn, Germany.

Slow Morse Transmissions

Regular slow Morse transmissions have proved of considerable benefit to many aspiring amateurs, but more volunteers are still required for districts not already covered and to allow a temporary respite to those who have given their services for several years.

Stations listed who find themselves unable to continue transmissions should immediately notify the organiser, Mr. C. H. Lamborn Edwards, A.M.I.E.E. (G8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

G.M.T.	*Call*	*kc/s.*	*Town*
Sundays			
09.30	G6NA	1750	Guildford
10.00	G6MH	1990	Southend-on-Sea
10.00	G5XB	1950	Reading
10.00	G3AEZ	1847	Dorking
11.00	GM3AVA	1860	Falkirk
12.00	G3CWW	1730	Hendon, N.W.4
20.00	G3FPS	1870	East Molesey
21.00	G2FIX	1812	Nr. Salisbury
22.00	G2FXA	1900	Stockton-on-Tees
Mondays			
13.00	G3AXN	1870	Southend-on-Sea
19.00	G3NC	1825	Swindon
19.30	G3AIX	1760	Birmingham
19.30	G3ESP	1850	Wakefield, Yorks
19.30	G3GYW	1922	Westcliff-on-Sea
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G3DSR	1750	Derby
20.00	G2CLD	1775	Tunbridge Wells
21.00	G3BLN	1900	Bournemouth
21.00	G3BHS	1820	Eastleigh, Hants
22.00	G8TL	1896	Ilford
22.00	GM4MF	1860	Falkirk
22.00	G3AEZ	1847	Dorking
23.00	G3EIW	1760	London, S.E.18
Tuesdays			
13.00	G3AXN	1870	Southend-on-Sea
19.00	G5XB	1905	Reading
19.30	G2AVK	1850	Ossett, Yorks
19.30	G2CPL	1900	Lowestoft
20.00	GI2HLT	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
23.00	G3EIW	1760	London, S.E.18
Wednesdays			
18.45	G3CQL	1990	Leigh-on-Sea
20.00	G2NY	1850	Preston
20.00	G3AFD	1783	Southampton
22.00	G6NA	1840	Guildford
22.00	G3DLC	1800	Grays, Essex
22.00	GM4JQ	1860	Falkirk
23.00	G3EIW	1760	London, S.E.18
Thursdays			
18.00	G3AXN	1870	Southend-on-Sea
19.00	G3NC	1825	Swindon
19.30	G2AQN	1850	Ossett, Yorks
19.30	G3BUJ	1990	Southend-on-Sea
20.00	G3FVH	1920	Hull, Yorks
20.00	G3NT	1805	Northallerton
21.30	G6DL	1760	Birmingham
22.00	G2FXA	1900	Stockton-on-Tees
22.00	G3ARU	1990	Wanstead, E.12
22.00	G3AEZ	1847	Dorking
22.30	G3OB	1803	Manchester
23.00	G3EIW	1760	London, S.E.18
Fridays			
13.00	G3AXN	1870	Southend-on-Sea
19.00	G3BLN	1900	Bournemouth
19.30	G3DMP	1850	Wakefield, Yorks
19.30	G2CPL	1900	Lowestoft
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G2AMV	1870	Wirral
21.00	G3BHS	1820	Eastleigh, Hants
22.30	G6JB	1820	Salcombe, Devon
23.00	G3EIW	1760	London, S.E.18
Saturdays			
22.00	GM3OM	1860	Falkirk
23.00	G2FXA	1900	Stockton-on-Tees
23.00	G3EIW	1760	London, S.E.18

OTHER AMATEURS ARE ASKED TO AVOID CAUSING INTERFERENCE TO THESE TRANSMISSIONS

NEW MEMBERS

The following have been elected to membership:—

Corporate Members (Licensed)

GW3CDT †D. R. JONES, 28 Edgehill Road, Aberystwyth, Cards.
G3FCX T. H. DURDEY, Hambleton, Stanfield Crescent, Cheadle, Stoke-on-Trent, Staffs.
G3GIX R. MARSDEN, 26 Queen Street, Chapeltown, Nr. Sheffield.
G3GRC R. J. T. ATHEY, 1 Gunter Grove, Chelsea, London, S.W.10.
G3GSP C. W. BOOTH, M.B.E., 304 Maidstone Road, Rainham, Gillingham, Kent.
G3GTH *E. R. COOPER, 90 Hillfield Road, Hampstead, London, N.W.6.
G3GTX C. A. GREAVES, 25 Hampden Way, Bilton, Rugby, Warwicks.
G3GUD *J. W. A. BOSWORTH, 72 Leacroft Road, Derby.
G3GVU *R. S. BABBS, 28 Grove Lane, Kingston-on-Thames, Surrey.
G3GWD *M. C. PAVELY, 85 Callander Road, Catford, London, S.E.6.
G3GWO M. G. GROOM, 55 Broadwater Way, Worthing, Sussex.
G3GXH C. HASSALL, 44 Beresford Road, Southall, Middlesex.
GI3GXP W. F. MCGONIGLE, 61 Newcastle Street, Kilkeel, Co. Down.
G3GYU †J. WILD, 2 Fir Street, Ramsbottom, Manchester.
G3GYX †J. J. WILSON, 1 Abbott Street, Long Eaton, Notts.
G3GZL G. M. BOLTON, Preshute House, Marlborough, Wilts.
G3GZS P. H. PRICE, 4 Holcombe Road, Tyseley, Birmingham 11.
GW3GZM L. F. DYKE, 5 College Terrace, Berrington Road, Tenbury Wells, Worcs.
G3GZX A. E. BLADON, 62 Gainsborough Road, Wallasey, Cheshire.

Corporate Members (Overseas)

W1MCW MRS. L. LITTLEFIELD, 19 State Avenue, Cape Elizabeth, Maine, U.S.A.
ZD6EF H. E. FINCH, Postmaster, Limbe, Nyasaland.
ZS6AAP I. B. C. JONES, 5 Lukes Buildings, King Edward Street, Potchefstroom, Transvaal, South Africa.
ZS6SB K. O. BAUMANN, P.O. Box 9366, Johannesburg, South Africa.
SM5ZK BO PALMBLAD, Torkel Knutssonsgatan 29 Stockholm, Sweden.
FRS.225 J. C. L. WONG, 19 Market Street, Ipoh, Perak, Malaya.

Corporate Members (British Receiving Stations)

18966 *J. V. ELLIS, Cheshunt, Broadmark Avenue, Rustington, Sussex.
18981 *S. R. MORRIS, School House, Church End, Stonehouse, Glos.
18982 F. W. CHARRINGTON, 141 Gt. Portwood Street, Stockport, Cheshire.
18983 A. E. FIELDING, 121 Grange Street, Burton-on-Trent, Staffs.
18984 W. R. GODDEN, 59 Mycenae Road, Blackheath, London, S.E.3.
18985 J. MILYON, 124 Northcote Avenue, Southall, Middlesex.
18986 C. MCCULLOCH, Lambton Park Estate, Fencehouses, Co. Durham.
18987 A. B. FLETCHER, 2 Fairview Cotts., East End, London Road, Charlton Kings, Cheltenham, Glos.
18988 G. J. P. HUGHES, 103 Howard Avenue, Bexley, Kent.
18989 N. J. BARNACLE, 23 Coombe Road, Shirley, Birmingham.
18990 J. BARBER, 64 Moss Street, Rochdale, Lancs.
18991 H. E. LIVERMERE, 85 Edward Road, Somerford, Christchurch, Hants.
18992 C. W. A. FRY, 21 Suffolk Road, Newbury Park, Ilford, Essex.
18993 A. G. SHEARING, H.M. Submarine "Astute," c/o G.P.O., London.
18994 H. T. MASON, 115 Talbot Road, Old Trafford, Manchester 16.
18995 C. T. VINING, Park Hill, Farm House, Shirehampton, Bristol.
18996 A. BAGLEY, Astbury Cottages, Parkgate Road, Gt. Saughall, Nr. Chester.
18997 R. TROHEAR, 11 Trumpet Road, Wath Brow, Cleator, Cumberland.
18998 L. W. J. DOWIE, 29 Elm Road, Shoeburyness, Essex.
18999 J. BRODZKY, 25 Gayville Road, London, S.W.11.
19000 *A. J. R. SLANEY, 32 Highland Grove, Worksop, Notts.
19001 E. BASILIO, 111 Vale Road, Portslade, Sussex.
19002 E. R. DOWNS, 3 Rusham Road, Balham, London, S.W.12.
19003 T. DAY, 269 Manchester Road Heaton Chapel, Stockport, Cheshire.
19004 A. S. MARSHALL, 24 Clive Road, Rochester, Kent.
19005 F. JENKINS, 17 Thames Street, Belfast, N. Ireland.
19006 G. J. BURGESS, 225 Havant Road, Drayton, Hants.
19007 B. L. HART, 14 Harrison Avenue, Bournemouth, Hants.
19008 R. CUNNINGHAM, 108 Liverpool Road N., Maghull, Nr. Liverpool.
19009 W. J. HARES, 678 Stapleton Road, Bristol, Glos.
19010 J. L. GOSS, 117 Hainault Avenue, Westcliff-on-Sea, Essex.
19011 R. H. LEWIS, 6 Glamorgan Terrace, Penrhiwceiber, Nr. Mountain Ash, Glam
19012 A. M. KEY, 166 Kenrick Road, Mapperley, Nottingham.
19013 H. A. TRIMMER, 49 Houblon Road, Richmond, Surrey.
19014 J. D. PAYNE, 3 Ruskin Avenue, Manor Park, London, E.12.
19015 J. H. HALL, 11 Near Lane, Meltham, Nr. Huddersfield, Yorks.

Associates and Junior Associates

I. F. BOON, West Cottage, School for the Deaf, Great North Road, Newcastle-on-Tyne 2.
A. D. COUCHMAN, 9 Rankine Road, Tunbridge Wells, Kent.
S. J. S. DYER, 42 Grange Road, Ilford, Essex.
A. FROST, 10 Fowlerscroft, Compton, Nr. Guildford, Surrey.
L. GITTINS, Diplomatic Wireless Service, Block F, Bletchley Park, Bletchley, Bucks.
R. GRAH, 42 Fossdale Road, Sheffield 7.
S. M. K. HORNE, 7 Newland House, Avignon Road, London, S.E.4.
J. JACKSON, 5 Albert Road, Glasgow S.2, Scotland.
R. P. KELLY, 2 Kirkway, off Cortsway, Greasby, Cheshire.
L. S. KILNER, Churchill, Aston Road, Chipping Campden, Glos.
H. J. MERRISON, Haileybury and Imperial Service College, Hertford.
D. HARRINGTON, 40 Wellington Avenue, Chingford, London, E.4.
H. W. PRODGER, 41 Capel Road, East Barnet, Herts.
J. REILLY, 74 Craigendmuir Street, Glasgow, E.1, Scotland.
L. SARJEANT, 86 Western Road, Crookes, Sheffield 10.
B. K. SAUNDERS, 56 Courtfield Avenue, Harrow, Mdx.
C. STRAW, 142 Bucknall Old Road, Hanley, Stoke-on-Trent, Staffs.
J. R. TOOTHILL, 40 Holden Avenue, Sharples, Bolton, Lancs.
G. H. WELLS, 21 Ivanhoe Avenue, Nuneaton, Warwicks.
T. WORTON, 16 Hall Street, St. Helens, Lancs.

* Denotes transfer from Associate Grade.
† Re-elected to membership.

EXPERIMENTAL STANDARD FREQUENCY TRANSMISSIONS

GB1RS

The Headquarters' Station, GB1RS, transmits daily for two minutes at each hour from 1800 G.M.T. to 0900 G.M.T. on a frequency of

3500.25 kc/s

when the following message is sent automatically in Morse Code at a speed of 12 words per minute :

CQ de GB1RS QRG 3500.25 kc/s. $\overline{VA}$ GB1RS

Overseas members are invited to report on the reception of these transmissions.