AUGUST, 1960

RSGB BULLETIN

VOL. 36, No. 2

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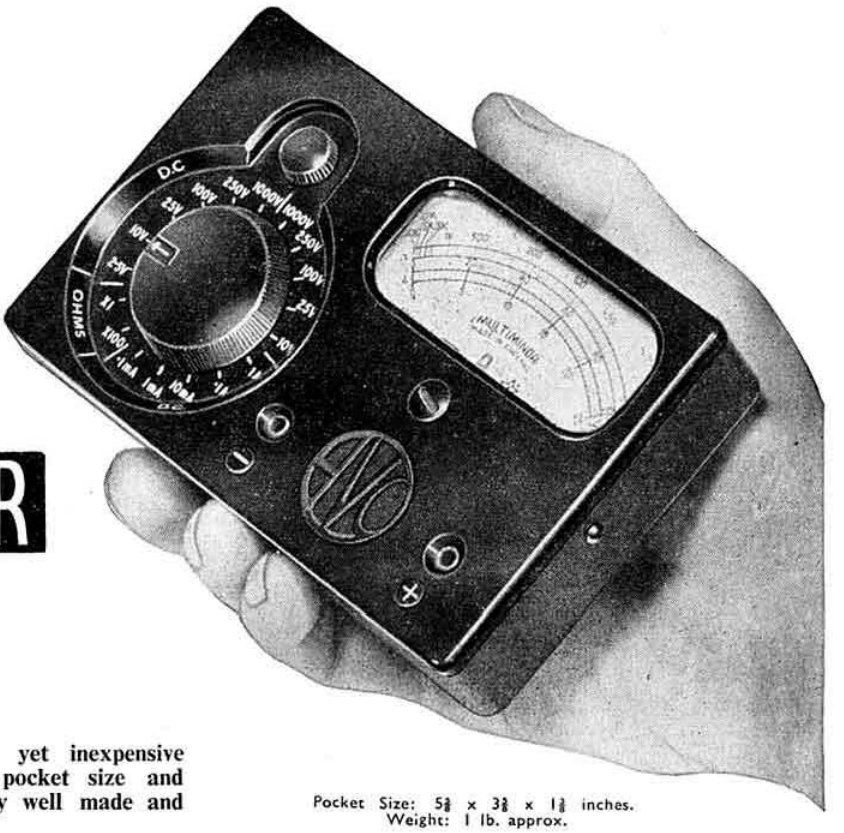

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0 — 10 V.	0 — 100 V.	0 — 10mA
0 — 25 V.	0 — 250 V.	0 — 100mA
0 — 100 V.	0 — 1000 V.	0 — 1 A
0 — 250 V.		
0 — 1000 V.		

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Volume 36 No. 2

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2/6 Monthly

R.S.G.B. BULLETIN

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(Incorporated 1926)

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The annual subscription rates to the R.S.G.B. are as follows: Home Corporate Members—30/-; Overseas Corporate Members—28/- ($4 U.S. or Canadian); Associate Members under 21 years of age—15/-. Application forms may be obtained from Headquarters on request.

Current Comment

discusses topics of the day

National Convention

LITTLE more than 30 days separate us from the opening of this year's National Convention at Cambridge, the first for six years. But though the great event is so little time away, there is even less in which to apply for tickets for the many functions in the crowded three-day programme. To remove any doubts there may be, all applications must reach the Secretary of the Convention Committee by August 29 next.

Even a cursory glance at the programme overleaf, or at the ticket application form enclosed in the July issue of the BULLETIN, will show how wide a choice there is, from the opening lecture by Mr. J. A. Ratcliffe, M.A., F.R.S. (soon to be Director of the D.S.I.R. Radio Research Station) to a visit (albeit intended for the distaff side but likely to attract many others as well) to the Chivers Factory. Between these two extremes there will be plenty to appeal to everyone—lectures by distinguished speakers on subjects closely akin to radio for all their unfamiliar titles and visits of scientific interest.

While it is difficult to pick out for special mention any of the talks, it is safe to say that those who heard Mr. Towers' lecture to the Society in London last year are likely to be amongst the first to book their seats for his description of " Recent Developments in Semiconductors."

Now that the discussions—and indeed arguments—on the relative merits of single sideband are practically over, more and more amateurs are vitally concerned in learning about the subject. Mr. Bagley's lecture on the Saturday morning is therefore sure of an attentive audience. Earlier on the same day, Professor Martin Ryle, M.A., F.R.S., himself a licensed radio amateur and one of the liveliest of speakers, is confidently expected to have an equally enthusiastic gathering for his talk on the Mullard Radio Observatory. For the v.h.f./u.h.f. man, there are lectures on recent developments in microwave valves, masers and parametric amplifiers (in view of the difficulties practically everyone, amateur and professional alike, has run into with the latter devices, this is likely to be a particularly lively session).

Most radio amateurs thoroughly enjoy the opportunity to air their views on pet subjects and the opportunity to do so will be provided on the Saturday afternoon (no doubt with the idea of having everyone suitably calmed down before the Convention dinner!) when a number of specialist group discussions will take place. This will be *the* opportunity to swap ideas, glean information or just ride a favourite hobby horse for a few minutes.

But aside from the formal programme, Convention offers an unparalleled opportunity to meet and discuss Amateur Radio in all its forms with others of like, or indeed of opposed, mind and to fit face to call-sign.

See you in Cambridge!

National Radio Show

FOR some years, those primarily interested in the technique of radio rather than in one of its end-products—entertainment—have perhaps somewhat unkindly tended to write off the annual National Radio and Television Show in London as something of a furniture exhibition strictly for laymen. The news that this year there is to be a piano section would seem to reinforce that view. In fact, however, the 1960 Show promises to be better than many of its predecessors from the point of view of the radio amateur. Manufacturers well-known in Amateur Radio circles will be showing new kits and components while test equipment, transistors and printed circuits will be specially featured. Indications are that the transistor particularly, and with it miniaturization, will be well to the fore. At least one firm is expected to introduce a v.h.f. transistor set for f.m.—of itself perhaps not of great importance from the Amateur Radio point of view but of considerable interest as an indication of the continued progress of the transistor into the field previously served by the thermionic valve.

The Society's own stand will again be the focal point for members visiting the Show. Amateur equipment of many types, including that used by R.A.E.N., will be on display and the complete range of publications and supplies handled by the Society will be on sale. Members are asked to be sure to sign the Visitors' Book on the stand.

Like the R.S.G.B., the Royal Air Force Amateur Radio Society is a regular exhibitor and their stand is certain to attract much attention from radio enthusiasts.

Ignoring the pianos and the veneers, this year's Radio Show at Earls Court will be well worth a visit.

NATIONAL RADIO AND TELEVISION SHOW

Earls Court, London · August 24-September 3 1960

* *The R.S.G.B. stand will be No. 411 in the gallery* *

The rendezvous for all radio amateurs

RADIO SOCIETY OF GREAT BRITAIN

National Convention, Cambridge 1960

Programme of Events

The full programme of events for the Convention is set out below. An application form for tickets was enclosed in the July issue of the R.S.G.B. Bulletin. Additional forms are available from The Secretary, R.S.G.B. Convention Committee, on request.

In order to give the Convention Committee as much time as possible to complete their arrangements, members are requested to complete and return their forms as soon as possible, with the necessary remittances, to The Secretary, R.S.G.B. Convention Committee, 37 Metcalfe Road, Cambridge. The closing date for applications is August 29, 1960.

Thursday, September 15

10.15 a.m. Reception Desk opens
12.00 noon OFFICIAL OPENING by The Rt. Worshipful the Mayor of Cambridge (Councillor Cecil A. Mole, J.P.). Display will be opened at the same time
3.30 p.m. "Cambridge," an introductory talk by F. A. E. Porter. This will be followed by a tour of the city
8.00 p.m. "Cambridge—City and University," by Alderman G. E. Hickson, M.A. An illustrated talk
10.00 p.m. Reception Desk and Display close

Friday, September 16

8.30 a.m. Reception Desk opens
9.15 a.m. Display opens
9.15 a.m. Visit to Engineering Laboratory (1½ hours)
9.30 a.m. "Fundamental Research and Practical Telecommunications." The Opening Lecture by Mr. J. A. Ratcliffe, M.A., F.R.S.
10.00 a.m. Visit to Chivers Jam Factory, Histon (approx. 1½ hours)
10.30 a.m. Visit to The American Military Memorial, Madingley .. .. .. (1½ hours)
11.00 a.m. Visit to EDSAC II, Mathematical Laboratory (1¼ hours)
11.15 a.m. "Micro-wave Radio Link Equipment," by T. P. Blott
11.15 a.m. "Telecommunications in the Body," by P. E. K. Donaldson, M.A.
12.30-2.15 *LUNCH BREAK*
2.10 p.m. Visit to I.T.A. 7000 Mc/s Link, Barkway (3-3½ hours)
2.15 p.m. "Recent Developments in Micro-wave Valves," by A. H. Beck, M.A., B.Sc.
2.15 p.m. "Recent Developments in Semi-conductors," by T. D. Towers, M.B.E., M.A., B.Sc. (ex-VP2GM)
2.20 p.m. Visit to Little Barford Power Station (3-3½ hours)
2.30 p.m. Visit to the Guildhall, Cambridge, to inspect the Civic Regalia and enjoy the view from the roof (1 hour)
4.00 p.m. "Low-noise Receivers, using Masers and Parametric Amplifiers," by F. G. Smith, M.A., Ph.D.
4.00 p.m. "Whistling Atmospherics," by B. H. Briggs, M.A., Ph.D. (G2FJD)
7.30 p.m. Conversazione and Buffet Supper
10.00 p.m. Reception Desk and Display close

Saturday, September 17

8.30 a.m. Reception Desk opens
9.15 a.m. Display opens
9.30 a.m. "The Mullard Radio Observatory," by Professor M. Ryle, M.A., F.R.S. (G3CY)
9.30 a.m. Visit to Ely Cathedral and Tour of the Fens (3 hours)
9.45 a.m. Visit to Pye Telecommunications Factory, Cambridge .. .. .. (2 hours)
11.15 a.m. "Single Sideband," by G. C. Bagley (G3FHL)
11.15 a.m. "Industrial Television," by I. Waters (G3KKD/T)
12.30-2.15 *LUNCH BREAK*
2.15 p.m. "The Electronic Telephone Exchange," by D. Delanoy (G3FOQ)
2.15 p.m. Visit to the Mullard Radio Observatory, Lords Bridge .. .. .. (1¾ hours)
2.15 p.m. Film Show by The Eastern Electricity Board
2.30 p.m. Visit to Sawston Hall, Sawston (1½ hours)
4.00 p.m. Group Discussions and Demonstrations: DX; V.h.f.; S.s.b.; RTTY; Mobile; Amateur Television
4.00 p.m. "Catering for Numbers and its Problems," by H. M. Littlechild, F.C.F.A. (Sidney Sussex College) and D. N. Lambert, F.C.F.A. (Addenbrokes Hospital, Cambridge)
7.00 for 7.30 CONVENTION DINNER
7.30 p.m. Reception Desk and Display close

All events, except for Visits and the Convention Dinner, will be held in the Arts School, Bene't Street, Cambridge

Members attending the Convention are asked to register at the Reception Desk in the Examination Hall at the Arts School on arrival.

A *P-N-P* and *N-P-N* Transistor Tester

By IVOR L. HAMPTON (G3JLH) *

THE instrument to be described is a small, compact, self-contained, battery-powered test set providing a quick and accurate direct measurement of current gain and collector leakage current of *p-n-p* and *n-p-n* transistors under static, grounded emitter conditions. It will also give a good indication of the state of diodes when compared with a similar type in good working order.

A simple form of protection is included which will guard against damage if a transistor with an internal short is connected for test. Collector leakage, *I'c(o)*, is read on the 0-1 mA meter. The current gain (*beta*) is arranged in two switched ranges: 0-100 at 100 μA base current and 0-250 at 40 μA base current. On *beta* test, the meter is shunted to read 10 mA full-scale deflection (f.s.d.).

The instrument should prove extremely useful to the radio amateur and the radio service engineer, and indeed may prove indispensable.

General Description

No attempt will be made to explain the theory of transistor operation but a brief reference to the more familiar triode valve is not thought to be out of place. In a valve the influence of the control grid voltage on the anode current is indicated by the change in anode current produced by a small change in grid voltage. This is termed the mutual conductance and is denoted by *gm*, and is expressed in mA/V.

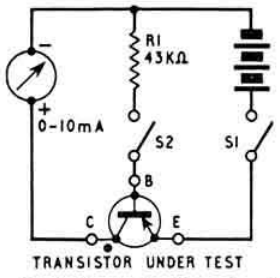


Fig. 1. Basic circuit of a p-n-p transistor tester.

Testing a transistor under grounded emitter conditions is somewhat similar to the above, the emitter base and collector of the transistor corresponding to the cathode, grid and anode of the valve. The base is the controlling element; if there is a small change in base current there will be a much larger change in the collector current. The grounded emitter current gain, termed *beta* or α', is the ratio of the collector and base currents, and the measurement of it is here simplified by using a defined base current and indicating the collector current on the meter.

Fig. 1 shows the basic requirements for a very simple tester and was in fact the prototype of the more useful tester to be described. The operation is as follows: connect a transistor to the appropriate terminals, close switch S1 and read off the collector leakage current. (The value of this will normally be under 100 μA.) Next close switch S2, allowing a base current of 100 μA to flow and then read off the collector current. A full scale reading will indicate a gain of 100 (the ratio of 10 mA collector current, divided by 100 μA base current). An OC71 for example may give 5 mA, thus indicating a gain of 50, and similarly for other transistors.

* *14 Hill View Road, Bournemouth, Hampshire.*

The complete tester in its case. The switches, l. to r., top row, are S2, S4 (n-p-n to the left, p-n-p to the right) and S1. At the bottom left is S3. The white spot to the left of the spring-loaded terminals indicates the collector connection. The centre one is for the base and right-hand terminal for the emitter.

Fig. 2 gives the complete circuit of a practical tester. A 0-1 milliammeter is used for indicating the collector leakage current and was chosen as a good compromise between sensitivity and expense. The meter is shunted to read 10 mA full scale when measuring the transistor current gain.

To enable *n-p-n* transistors to be tested, a four-pole change-over switch is used to reverse the battery and meter connections. Some transistors such as the OC44 and the V6/R8 have a high gain and a small allowable dissipation.

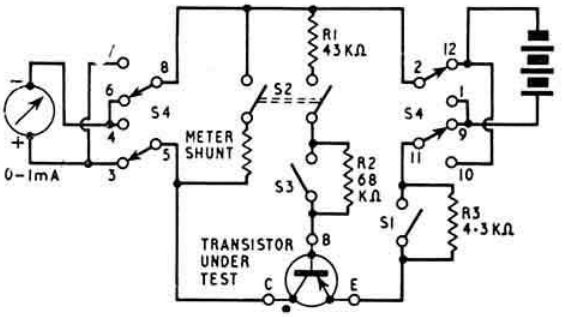


Fig. 2. Complete circuit diagram of the transistor tester.

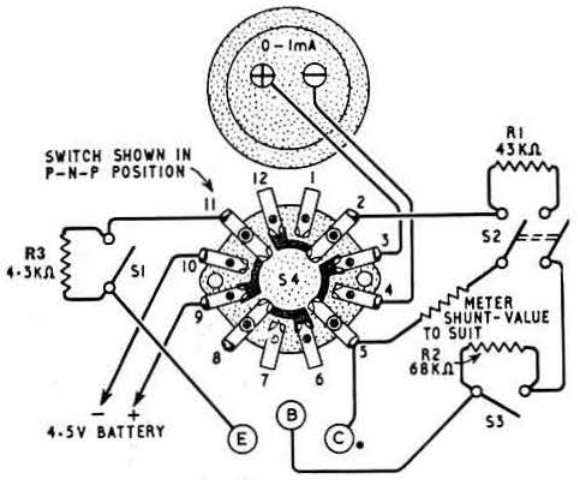


Fig. 3. The layout viewed from the rear of the die-cast box.

R2, in conjunction with R1 (68 K and 43 K ohms respectively), limits the base current to 40 μA. In this position, full scale deflection of the meter indicates a gain of 250 (10 mA collector current divided by the 40 μA base current gives a gain of 250). The purpose of R3 (4·3 K ohms) is to limit the meter to full scale deflection should a transistor with an internal short be connected. In this case, the push switch must *not* be pressed, thus avoiding meter overload, and the faulty item should be discarded.

Some readers building this tester may wish to use a meter which they have on hand. In such cases the required shunt-resistor can be calculated from the formula:

$$\frac{\text{resistance of meter}}{\text{scale multiplying factor minus one.}}$$

With a 0-1 mA meter the scale multiplying factor is 10. With a 250 μA meter it would be 40.

It should be noted in the current gain test that the $I'c(o)$ component is part of the current reading indicated but as this is very small compared with the collector current, no attempt has been made to eliminate it, the error introduced being 1 per cent or less. The limiting resistor R3 should be changed to 8·2 K ohms if a 0-500 μA meter is used and to 15-18 K ohms with a 0-250 μA movement.

Construction

Little need be said about the layout and construction of the tester, except that mounting the components on the lid of the die-cast box gives accessibility and makes the wiring easier. The layout in Fig. 3 is recommended, the components

Components List

R1 43 K ohms ¼ watt high stability (Painton)
R2 68 K ohms ¼ watt high stability (Painton)
R3 4·3 K ohms ¼ watt high stability (Painton)
Meter shunt (3·7 ohms for meter specified: w.w. 2·5 ohms + 1·5 ohms)
S1 push-button switch (Painton)
S2 double pole on/off switch (Cutler Hammer)
S3 s.p.s.t. switch
S4 4-pole change-over switch, wafer type, non-shorting contacts, with knob (Plessey)
1 die-cast box 4¾ in. × 3¾ in. × 2¼ in. (Eddystone)
1 m.c. meter 0-1 mA f.s.d. flush round (Ernest Turner Electrical Instruments type 909)
3 spring-loaded terminals (Belling and Lee)
1 4·5 volt battery (Ever-Ready type 1289)
1 battery clip with nuts washers and screws
1 small carrying handle
4 small grommets (for use as feet for the box)

TABLE I

Type		Leakage	Average Gain
p-n-p	OC44	25 μA	100
p-n-p	OC45	12 μA	60
p-n-p	OC70	110 μA	30
p-n-p	OC71	150 μA	50
p-n-p	OC72	100 μA	70

used fitting comfortably into the box. The box can be finished, if desired, by spraying with a suitable cellulose paint, fitting rubber grommets to the base as feet and adding a small carrying handle. A 4·5 volt battery (Ever-Ready type 1289) is clamped to the inside of the box with a suitably-shaped strap.

Not many amateurs are in a position to make their own wafer switches but this item may be obtained from advertisers specializing in this service if a suitable ready-made type is not available locally. The contacts should be of the non-shorting type; that is, break before make. The switch wafer is wired as in Fig. 4 but on the under side for neatness.

R1 and R2 are standard value ¼-watt resistors of close tolerance and high stability. If another type of resistor is used, any small variation from the values quoted should be towards a lower resistance, certainly not a higher. The meter shunt resistor must be selected carefully if accuracy of measurement is required. The meter and its shunt should be compared with an instrument of known accuracy before fitting into the tester.

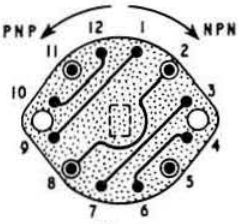


Fig. 4. Wiring of the wafer switch

Operation

Transistor Test. Open both toggle switches, set switch S4 to the *p-n-p* position. In the first instance only, use a voltmeter to check that the collector terminal is negative with respect to the emitter terminal. This being so, connect a *p-n-p* transistor, such as OC44, OC71, etc. If the meter reads full scale, an internal short is indicated and the transistor is unserviceable. If the meter is not indicating full scale deflection, press the button and read off the collector leakage current directly on the 0-1 mA scale. As transistors of the germanium type are very temperature conscious, an abnormally high leakage, perhaps double the normal, will be indicated if the transistor is handled for too long with warm hands especially near a fire

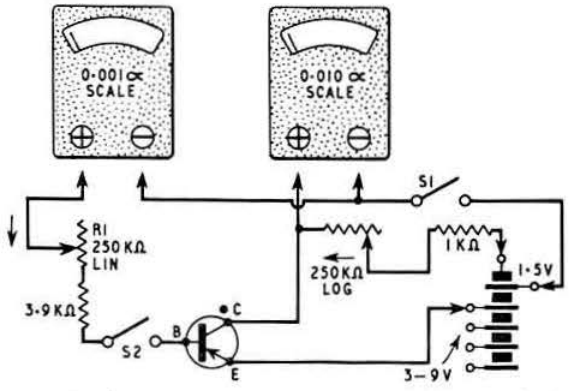


Fig. 5. Circuit arrangement using external meters for monitoring the base and collector currents.

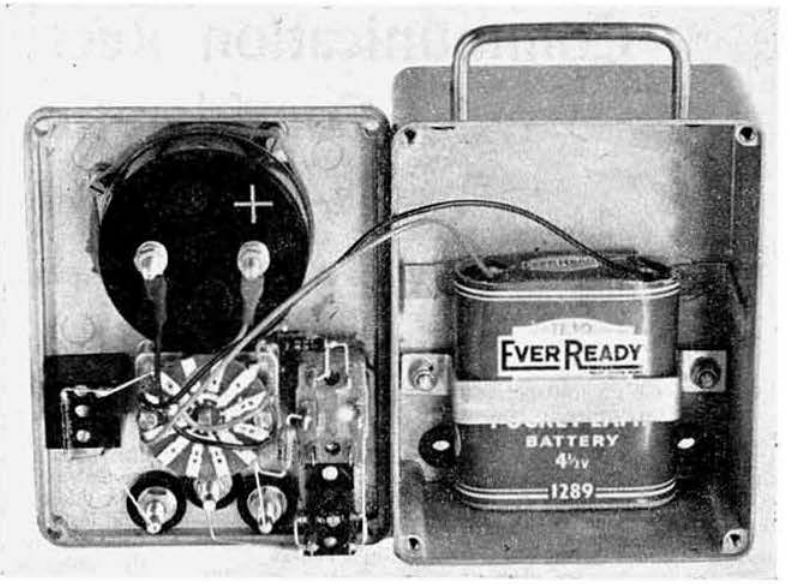
or a hot radiator. The transistor should be at normal room temperature when tested.

Next close switch S2 and read off the current gain on the 0-250 scale. If the gain is under 100, close switch S3 and read on the 0-100 scale. It is quite normal for the transistor gain to be a little higher (or lower in some cases) on the 0-100 scale due to operation on a different part of its characteristic curve. (This curve is not quite linear.) Typical test figures are given in Table 1 for five popular types of transistor and can vary over quite a wide range and still be within the manufacturer's specification. For further information on this subject, the reader should refer to the transistor characteristic sheets issued by the manufacturer.

For *n-p-n* transistors, set switch S4 to the *n-p-n* position and carry out the testing procedure as above.

Diode Testing. With switch S4 in the *p-n-p* position and switch S2 open, connect the cathode (bar and red end) of the diode to the collector terminal and the anode to the emitter terminal. The meter should give a full scale deflection, indicating a low forward resistance. Move switch S4 to the *n-p-n* position (this reverses the voltage on the diode) and the meter should drop to zero, indicating a high back resistance. As this is only a simple check, and not a measurement, it may be advisable to compare the results with a diode of the same type which is known to function correctly. In this test, the push button S1 is not used.

The transistor tester described has proved a most useful instrument in everyday work, all transistors being tested before use, and before re-stocking when they have been removed from equipment which has been broken down. Matched pairs of transistors can be selected for use in push-pull circuits and a closer tolerance obtained than is usually found in commercially selected pairs.



An interior view of the transistor tester. The components may be identified by reference to Fig. 3.

A circuit which uses external meters for monitoring the base and collector currents is shown in Fig. 5 and may appeal to experimenters as an adaptor unit to multi-range meters. In this set-up, the base current is varied by means of R1 and the change in collector current observed on the second meter. The variable control in the battery negative line is for zeroing the meter on the current gain test by nullifying the collector leakage current ($I'c(o)$) by passing a reverse current through the meter in the collector circuit equal to the leakage current. For *n-p-n* type transistors, the battery and meter connections must be reversed.

New Talking Book Tape System

RESEARCH by the Royal National Institute for the Blind and St. Dunstan's has resulted in a new system of tape recording and play-back for use in the Talking Book service. The new system will gradually replace the present disc service during the next five years.

The play-back machine is of considerable interest and has been designed to be as simple to operate as possible. The only controls are the on/off volume switch and a start/stop lever. Facilities are provided for headphone listening. The machine measures 15 in. × 13 in. × 10 in. Two safety devices guard against accidental damage.

The recorded material is contained in a cassette loaded with ¼ in. tape with a playing time of up to 24 hours. In contrast to the two or four tracks of a normal domestic tape recorder, the new talking book machine uses 18 tracks, each 0·015 in. wide. The space between the tracks is 0·012 in. The speed of the tape is non-linear: one spool is always the take-up spool, the drive mechanism causing it to revolve, so pulling tape off the loaded spool and past the play-back head. The tape speed therefore varies according to the amount of tape on the take-up spool.

The play-back head is housed within the cassette and the whole assembly—tape, tape guide and head—is thus completely enclosed, so reducing to a minimum the possibility of damage due to mishandling or incorrect loading.

High speed copying machines, also designed by the Talking Book Dept. will provide facilities for the rapid production of the thousands of " books " required.

Introducing the new equipment to the Press last month, Lord Fraser of Lonsdale paid tribute to the work of members of the R.S.G.B. and the British Sound Recording Association in installing and maintaining Talking Book machines.

National Convention Stations

During the period of the National Convention in Cambridge three stations will be in operation on all bands from 1·8 to 28 Mc/s and on 144 Mc/s.

The main station will be in operation intermittently from September 12 to 17 using c.w., a.m. and s.s.b. on 3·5, 7, 14, 21 and 28 Mc/s.

From 10 a.m. on September 15, talk-in stations will be active on 1920 kc/s and 145·2 Mc/s. The Top Band station will listen for replies from 1925 kc/s up.

All stations will be on the air whenever possible until the end of the Convention, all using the call-sign

GB2CAM

Communication Receiver Design Considerations

Part 2.–General Considerations

By G. R. B. THORNLEY (G2DAF)*

IN Part 1, the general specification for an amateur communications receiver was discussed in some detail, particular attention being given to the " front end " and to the choice of the first intermediate frequency tuning range, bearing in mind the possibility of spurious response due to harmonics of the receiver oscillators. However, there are a number of other criteria still to be considered.

Second Channel Rejection—First Mixing Process

The requirements for adequate second channel rejection are complex because the i.f. that will give the maximum attenuation at the front-end will give the poorest attenuation in regard to the image interference of the second i.f. chain.

As the front-end requirement is the most important, this will be considered first. The figures given in Table 3 are the results of careful measurements made on a receiver using the tunable i.f. ranges shown.

TABLE 3

SECOND CHANNEL ATTENUATION (db)
FIRST MIXING PROCESS

BAND	Receiver Tuning (Mc/s)	I.F. TUNING RANGE		
		2·5 to 3·0 Mc/s	4·5 to 5·0 Mc/s	5·0 to 5·5 Mc/s
160	1·9	86	90	93
80	3·8	68	78	84
40	7·1	66	71	78
20	14·3	54	68	75
15	21·3	42	60	68
10	28·8	36	52	60

Test Procedure.—Signal generator input into aerial terminal. Two tuned circuits at signal frequency.

The picture presented indicates that the lower i.f. tuning ranges in Table 1 are satisfactory up to 20m but that the attenuation on 10 and 15m does not meet the target figures of 50db. In the higher tuning ranges shown in Table 2, the attenuation would be improved and using an i.f. range of 5·0 to 5·5 Mc/s would be not less than 60db—a most satisfactory figure indeed.

Second Channel Rejection—Second Mixing Process

It has already been stated that the tunable i.f. range that will give the best attenuation of the front-end image frequency will be the worst from the viewpoint of the second i.f. channel image frequency. Measurements have therefore been made for four tuning ranges from 2·0 to 5·5 Mc/s and are given in Table 4 in order to present an overall picture.

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Part 1 of this article appeared in the R.S.G.B. Bulletin for July, 1960. Copies are available price 2/6 each from R.S.G.B. Headquarters.

As would be expected, the poorest attenuation occurs on the highest i.f. tuning range. It is however quite good—certainly better than the writer expected—at 50db. With the signal input into the aerial terminal (as it would be in normal use) the two signal frequency tuned circuits would offer additional attenuation to a signal 920 kc/s off tune. For instance, if the receiver were switched to the 20m band and tuned to 14·3 Mc/s and measurements made with the signal generator input into the aerial terminal, the attenuation of the second i.f. image frequency on 13·38 Mc/s (14,300 less 920 kc/s) would be 64db.

Even on the 10m band it is expected that the overall figure would be improved by at least 10db. Therefore, even when using a high range of 5 to 5·5 Mc/s, the tunable i.f. will give an overall attenuation to the image frequency of the second mixing process of not less than 60db.

TABLE 4

SECOND CHANNEL ATTENUATION (db)
SECOND MIXING PROCESS

Input frequency (Mc/s)	Second channel frequency (Mc/s)*	I.F. tuning range (Mc/s)	Attenuation (db)
2·2	3·12	2·0–2·5	68
2·7	3·62	2·5–3·0	64
4·7	5·62	4·5–5·0	57
5·2	6·12	5·0–5·5	50

* Assuming second i.f. of 460 kc/s.

Test Procedure.—Signal generator input into first mixer grid. Wave change switch set to 10m band position. Conversion oscillator valve removed from socket. Two tuned circuits at tunable intermediate frequency.

I.F. Breakthrough

The problem of i.f. breakthrough has been left to the last, not because it is the least important, but because it is a problem peculiar to double conversion and possibly a factor not even considered by many constructors of tunable i.f. receivers. It can now be evaluated against a background of the requirements already discussed.

It would perhaps surprise and disturb many owners of double superhet receivers if they had to disable the conversion oscillator and tune across the two amateur bands adjacent to the first intermediate frequency and make a note of the number and the strength of the signals heard. Unfortunately the problem of i.f. breakthrough becomes most difficult when using those tunable i.f. ranges that are most satisfactory in regard to image rejection. Measurements have been made for the two ranges between 4·5 and 5·5 Mc/s and are given in Table 5.

As might be expected, the attenuation gets worse as the receiver front-end tuning gets nearer to the channel occupied by the tunable i.f. The 4 Mc/s figures have been included

as a matter of interest. In practice the highest input tuning on the 80m band would be 3·8 Mc/s. The figure is worse for the i.f. range 4·5 to 5 Mc/s because this is nearer to the band; but even using 5 to 5·5 Mc/s the attenuation at 44db does not meet the target figure of 50db down. This is an ideal tuning range in regard to second channel rejection but if the i.f. breakthrough figure cannot be improved, it will have to be abandoned.

Fortunately it is easy to include a simple parallel resonant absorption circuit in series with the 80m aerial coil and the r.f. valve grid. This can be tuned to 5·2 Mc/s and will give an additional 10 to 20db of rejection at 3·8 Mc/s without affecting the 80m performance of the receiver in any way.

TABLE 5
I.F. BREAKTHROUGH ATTENUATION (db)
FIRST MIXING PROCESS

Receiver tuning	I.F. TUNING RANGE	
	4·5 to 5·0 Mc/s	5·0 to 5·5 Mc/s
4·0 Mc/s	33	38
3·8 Mc/s	38	44
3·5 Mc/s	45	50
7·0 Mc/s	54	52
14·3 Mc/s	68	68
1·9 Mc/s	62	62

Test Procedure.—Signal generator input into aerial terminal. Signal frequency circuits correctly peaked for maximum at each input frequency shown in the first column.

That is the position in regard to first i.f. tuning. The choice is largely a personal one and a prospective constructor will be governed by such factors as the availability of heterodyning crystals, the required image rejection and the number of amateur bands to be used.

By the very nature of radio, the final choice must be a compromise. The four relevant factors have been discussed in detail. There is also a fifth—that of v.f.o. stability. It is generally considered that the v.f.o. will be more stable on a lower frequency. As a generalisation, the statement is true but it does not necessarily mean that a v.f.o. covering the range 5·5 to 6 Mc/s cannot be made with the required degree of frequency stability to meet the target requirements.

Signal Frequency Tuning

It must be clearly understood that for every setting of the tunable i.f. section, the receiver will accept at roughly equal strength *three* separate and distinct signals: the intermediate frequency itself, the heterodyning frequency less the tunable i.f., and the heterodyning frequency plus the tunable i.f.

To take an example: a receiver with a tunable i.f. of 2·5 to 3 Mc/s would require a 10 Mc/s heterodyning frequency for the 40m band. If the i.f. were tuned to 2·9 Mc/s the receiver would accept the 10 Mc/s less 2·9 Mc/s (difference frequency) input on 7·1 Mc/s and also the 10 Mc/s plus the 2·9 Mc/s (sum frequency or second channel) at 12·9 Mc/s. It can therefore be seen that signal inputs on 2·9, 7·1 and 12·9 Mc/s would all be converted to the final intermediate frequency, amplified equally and fed through the following receiver stages. There is only one part of the whole receiver where this can be prevented from happening. That is in the front-end tuned circuits between the aerial input and the first mixer grid.

The attenuation figures given in the Tables were measured on a receiver using two signal frequency circuits, the first as the aerial input coil and the second in the r.f. valve anode. Two tuned circuits are convenient in practice and can be tuned by a small two-gang capacitor brought out to a panel control and used in much the same way as the normal aerial trimmer. It is however important to realize that the required attenuation of the unwanted inputs is directly dependent not only on the choice of the two i.f. channels but also on the " goodness " factor of these two tuned circuits. These must be high Q with low loss coil formers, adjusted for accurate tracking throughout the range. Additionally if the required signal-to-noise ratio is to be obtained, the aerial input impedance must also be correctly matched to the coil on each of the amateur bands required.

Required Selectivity

Optimum selectivity is obtained when the passband at the 6db points is just wide enough to pass the required intelligence and the skirt bandwidth at the 60db points is narrow enough to reject any signal on the adjacent channel. The ratio of the width of the passband at the 6db and the 60db points is the shape factor of the filter. Ideally this should be unity as shown in Fig. 3 (b) in Part 1.

Target requirements for the receiver selectivity are 2·5 kc/s wide at the 6db points and not more than 4 kc/s wide 60db down. This requirement can be met with three half-lattice filter sections at the second intermediate frequency using FT241 crystals.

Because of the requirements of sideband switching the response must be symmetrical. This does not present any difficulty and alignment is simple and straightforward. The most suitable filter layout is two sections in cascade between the second mixer and the first i.f. valve; and the third section between the first and second i.f. stages.

The filter insertion loss will be about 6db per section or a total of 18 to 20db and the i.f. amplifier will have to make good this loss in addition to the 70db signal amplification. The total gain requirement of 90db can be obtained with three stages quite easily. This leaves something in hand to compensate for the small loss occasioned by the necessary damping of the i.f. transformers to prevent filter ringing and to offset the loss caused by negative r.f. feedback.

A useful addition is the Q multiplier rejection filter. For maximum performance this should be connected as early in the i.f. amplifier chain as possible but following the crystal bandpass filter.

The basic requirements up to the de-modulator have now been dealt with and the block diagram of a proposed layout is shown in Fig. 6.

Automatic Gain Control and S Meters

It is quite possible to use any communication receiver with manual gain control of the r.f. and i.f. stages but it is beyond dispute that some measure of a.g.c. can be a considerable operating convenience. This is particularly so for

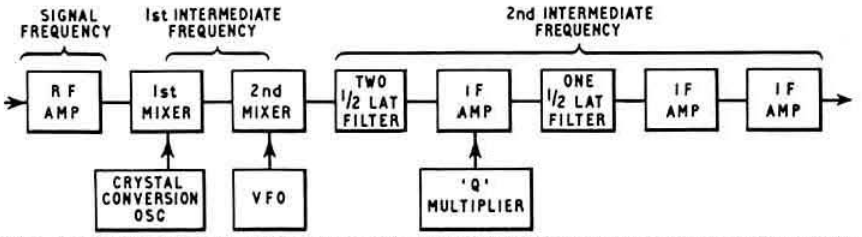


Fig. 6. Block diagram of the r.f. and i.f. stages with 460 kc/s second i.f. and three-section bandpass filter.

s.s.b. reception particularly where a number of stations of widely varying strength are operating together in a quick-fire QSO in one net. Under manual conditions with the gain turned up for a weak signal it is quite nerve racking and hard on the hearing when an S9 plus station interjects some remark. Additionally a good a.g.c. system will prevent overload in the i.f. section and will hold the audio output constant under difficult reception conditions where the wanted signal is fading badly. A further important consideration is that an indicating meter can be incorporated as part of the system and can be calibrated to indicate the strength in db or S points of the received signal.

Very few aspects of Amateur Radio have occasioned so much criticism and so many derogatory remarks as S meters and S meter reports. The writer does not intend to get involved in this controversy but when all signals are S9 but some are more S9 than others the whole thing becomes childishly impossible. This is a great pity! There is nothing wrong with the S meter—the fault is with the way in which it is used. The often heard report of S9 + 40db really indicates that the man giving it has no conception whatsoever of the meaning of S points and decibels. Whether the S meter is actually used for giving signal strength reports or not is entirely up to the operator but it has other uses that can be of considerable advantage.

A selectable sideband receiver is a precision instrument and can be used as such for accurate measurement where it is necessary to differentiate between two bands of frequency. If the S meter is correctly calibrated in db above the threshold noise level and the receiver is equipped with sideband switching, the meter reading can be used to give accurate sideband suppression reports for the benefit of the other station. It can additionally be used for the same purpose to measure transmitting equipment in the home station; in fact sideband suppression measurement of a phasing exciter with an oscilloscope fails at suppression levels better than 30 to 35db while the oscilloscope cannot be used at all on a filter rig.

A selectable sideband receiver becomes the only possible instrument that will allow adjustment and improvement while watching an indicating meter before the transmitter is put on the air. In addition the db ratio of the suppression of one sideband in relation to the other can be read off the meter.

In older receivers the a.g.c. cannot be used when the b.f.o. is switched on for c.w. or s.s.b. reception. The strong b.f.o. signal feeds into the a.g.c. diode and de-sensitizes the controlled stages. For this reason the a.g.c. has to be switched off when the b.f.o. is in use. This can be overcome by ensuring that the a.g.c. rectifier is effectively isolated from the inserted carrier.

The basic requirement of an a.g.c. system is to hold the audio ouput reasonably constant for changing signal levels. Ideally, the change in audio output would be zero for all input signal levels from the threshold noise level up to the receiver overload point.

Normal a.g.c. systems have a slow time constant of 0·1 or 0·2 second and operate on the level of the received carrier and cannot be used on s.s.b. signals because the carrier is suppressed at the transmitter. It is therefore necessary to devise a system that will operate on the incoming modulation and rise almost instantaneously at the input of a voice frequency but will hold its level between words, and at the end of a sentence or at the end of the transmission allow the receiver to return to its original full gain condition. The normal diode rectifier is quite satisfactory in this application and the required time constants can be obtained, either by using a series rectifier, or a " gate diode " and suitable *RC* time constant networks. Additionally the *RC* network can be switched to provide more than one release time. From practical experience it has been found that a fast rise time of 0·01 second is suitable for all types of transmissions and that a release time of 0·1 second for a.m. and c.w. and between 10 and 20 times longer for s.s.b. is very satisfactory.

Variation in a.g.c. voltage will affect the grid input capacitance of the controlled valve because of Miller effect and will pull the associated circuit. It is therefore considered bad practice to apply a.g.c voltage to mixer stages and in communication receivers it is normally applied to r.f. and i.f. amplifiers only.

The required negative bias voltage is obtained from the output of an a.g.c. rectifier. The input to this rectifier can be taken either from the i.f. amplifier at radio frequency or from the l.f. stage at audio frequency. From the point of view of performance the rectifier is not concerned with the input frequency and it is quite unrealistic to claim that the audio derived system is superior in performance to the r.f. derived system. In point of fact the performance of the two systems is identical. (The only proviso here is that there is sufficient input to the rectifier to develop the required

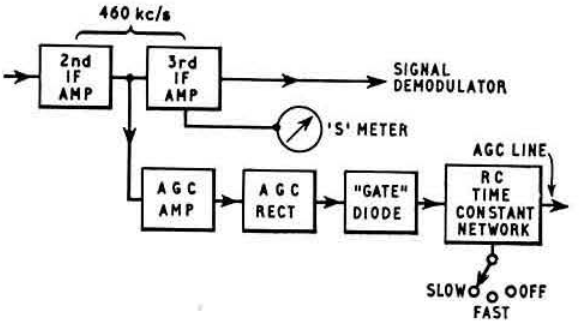


Fig. 7. Automatic gain control stages and control switching.

bias voltage output; in any receiver worth using for communication purposes adequate i.f. gain is available.) There may be advantages in an audio derived system from the viewpoint of simplicity or isolation from the carrier insertion oscillator (c.i.o.) input voltage but that is all. There are disadvantages too.

With modern variable-mu r.f. valves the a.g.c. voltage required for minimum gain depends on the type of screen feed. If the screen voltage is derived from a regulated line or a fixed potential divider this bias will be approximately 20 volts—if derived from a series feed resistor from the h.t. supply the bias will be about 50 volts.

A rectifier cannot provide more output than input. Assuming that the fast rise time will allow the output level almost to approach the peak value of the alternating input voltage, this means that the RMS value of the controlling input must be at least 15 volts (0·707 of 20) in one case; and 35 volts (0·707 of 50) in the other case. With all normal audio stages this amount of voltage is just not available, other than at the anode of the output valve. If it is taken from this point the voltage, and therefore the a.g.c. bias, will be dependent on the setting of the audio gain control. This is obviously most undesirable and in practice the audio voltage would be taken off ahead of the volume control and amplified to the required level by a separate a.g.c. amplifier valve.

If it is intended to use the receiver for normal reception (without the c.i.o.) a further disadvantage of the audio derived system is that the a.g.c. voltage developed would be proportional to the modulation depth. The same carrier modulated 100 per cent would give one S meter reading but if modulated 50 per cent would give a lower S meter reading. A signal with very low modulation would provide almost no a.g.c. voltage but it could be local and have a carrier strong enough to overload the receiver. Finally, the audio output—and therefore the a.g.c. voltage—would be

dependent on the detector characteristics and these would hardly be the same under heterodyne and envelope demodulation conditions. As it has been shown that the audio derived system requires an a.g.c. amplifier, the claim of simplicity is no longer valid. There then seems to be no reason for not including the amplifier in the i.f. chain and making the a.g.c. circuitry entirely separate and independent of changes in other parts of the receiver.

This is the preferred method and a block diagram of the arrangement is shown in Fig. 7.

De-Modulation and the Carrier Insertion Oscillator

It may perhaps appear surprising to discuss detection and carrier insertion oscillators together. However the demodulation of a c.w. or s.s.b. signal, or an a.m. signal received in the same way, requires the received sideband to be first combined with a local carrier. The c.i.o. is therefore an essential part of the de-modulation process.

For amateur band use the normal diode envelope detector is quite satisfactory for sideband reception and has the advantage that detector switching is not required. However it is agreed that the heterodyne detector gives less intermodulation distortion and when a receiver is being specifically designed for the highest possible performance the correct operating conditions for a specialized type of de-modulator can be included in the design.

Sideband de-modulation in a receiver is simply the reverse of modulation in a transmitter. The type of balanced modulator using two germanium diodes in a bridge circuit is known to give excellent results and exceptionally low distortion. This method will give comparable performance in a receiver. It has the advantage that the required r.f. input from the c.i.o. is at low impedance and therefore at a low voltage level and additionally the push-pull carrier input can be balanced so that no r.f. appears at the de-modulator input from the i.f. amplifier. This is rather important because any leakage of stray r.f. from the c.i.o. input getting back into the a.g.c. amplifier and rectifier system would produce operating bias, give an S meter reading and prevent the full gain of the receiver being available when required. (Obviously this could be prevented by a delay bias on the a.g.c. rectifier; however, a linear a.g.c. characteristic and delay voltage are not compatible.)

This type of de-modulator (a balanced bridge, modified ring modulator) is a true heterodyne detector and there is no output when the c.i.o. is switched off. It cannot therefore be used for normal a.m. reception and a second envelope detector for a.m. use has therefore to be provided. The required switching can be ganged to the c.i.o. switch so that the change over from sideband to a.m. conditions is automatic. This is shown in block diagram form in Fig. 8.

Where it is felt that the added complication of two separate de-modulators is not worth while, a normal diode envelope detector can be used for both functions; a very good alternative is to use a small triode valve such as a 6C4 as an

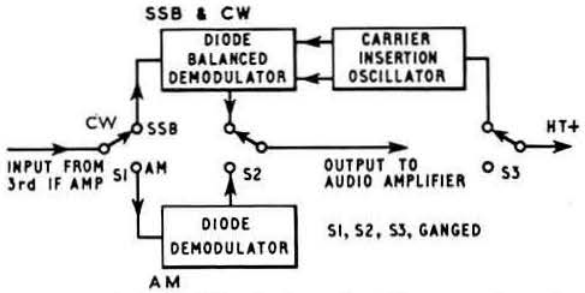


Fig. 8. Required switching for heterodyne detector and envelope detector.

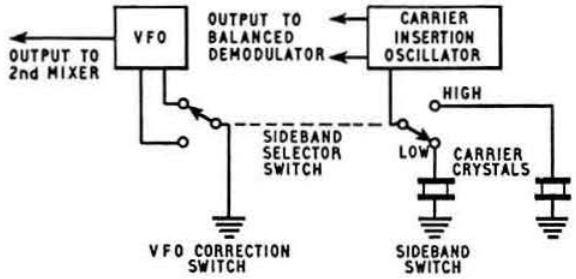


Fig. 9. Sideband switching, showing crystal control of the c.i.o. and automatic v.f.o. correction.

infinite impedance detector. Both signal and c.i.o. inputs are applied to the grid and the audio is developed across a high value of cathode bias resistor. Consequently there is a large amount of negative current feedback and the distortion is low.

Correct audio balance and natural speech quality can only be obtained when the local carrier is re-inserted in the correct frequency relationship with the sideband. The c.i.o. frequency can be adjusted manually by a panel control or it can be crystal controlled. With a narrow pass band of 2·5 kc/s and steep filter skirt response, the correct positioning of the carrier is critical and there is not in practice much point in having a variable control.

Because of the operating convention of transmitting low sideband below and high sideband above 10 Mc/s it is also necessary to be able to place the c.i.o. frequency on either side of the pass band. Additionally, when switching sidebands to give suppression reports, or to avoid interference when receiving a normal a.m. or c.w. signal, it is necessary to carry out the switching quickly and to be quite sure that at the same time the carrier is correctly positioned in regard to frequency.

In view of these requirements and the operating convenience of using a simple switch for change over, there is an advantage in using crystal control. The bandpass filter response curve can be plotted—the two points 20db down, marked on the curve—and the two carrier crystals carefully edge ground or plated to the required frequencies.

A further advantage of crystal control is the greater degree of stability and the avoidance of warm up drift. A block diagram of the suggested arrangement is given in Fig. 9.

Audio and Output Stages

Put in the simplest possible terms, the requirements for the audio amplifier and the output stage are dependent on the voltage available from the demodulator and the grid drive for the output valve it is required to use.

The low impedance balanced diode demodulator will give less output voltage and require more audio gain following it than a thermionic diode or infinite impedance detector. If the requirement is mainly to drive headphones, or a small loudspeaker, an output power of a few hundred milliwatts will be ample and a valve of the EF91 or EF80 class will be suitable. Such a valve will require less grid drive than say a 6BW6 rated at 2 watts.

A further consideration is the required audio response. Most of the power is contained in the lower audio register and if a flat audio frequency response is required, the output valve will have to handle much more power than would be necessary where the amplifier low frequency response had been " tailored " by using small values of coupling capacitors and/or reducing the value of the cathode by-pass capacity.

The writer considers that it is not possible to report

(Continued on page 66)

The Folkestone I.A.R.U. Region I Conference

PART II

By JOHN CLARRICOATS, O.B.E. (G6CL)*

IN Part I of this article (July 1960) it was recorded that four Committees were set up at the first Plenary meeting of the I.A.R.U. Region I Division Conference held at the Grand Hotel, Folkestone from June 13 to 17, 1960. The recommendations of the Credentials & Finance Committee were reported upon in Part I. In Part II a brief account will be given of the recommendations of the other three Committees, namely Administrative & Operational, Technical and V.H.F.

Administrative & Operational Committee

This Committee met under the chairmanship of Major Per-Anders Kinnman (SM5ZD) with Mr. Osmo Wiio (OH2TK) acting as Secretary.

Recommendations adopted by the Committee and later accepted by the Conference at the final Plenary meeting were as follows:

(i) Subscribing Member Societies shall be urged to pass on to the Headquarters of Region I Division any official information they may obtain about the constitution of the panel of technical experts which is to be set up, following the Geneva Radio Conference, to study the spectrum between 4 and 27·5 Mc/s.

(ii) Subscribing Member Societies referred to in the Geneva Radio Conference Footnote 145 shall apply in due time to their licence issuing authority on behalf of the amateurs in their respective countries for permission to operate between 1800 and 2000 kc/s. Any difficulties shall be reported to the Headquarters of Region I Division.

(iii) The European Band Plan, in so far as it applies to 3·5, 14 and 21 Mc/s, shall not be altered. On 7 Mc/s the telephony section shall be from 7050 to 7100 kc/s when the 50 kc/s segment between 7100 and 7150 kc/s is withdrawn.

(iv) Single sideband operation shall continue to be confined to the upper portion of each band as at present.

(v) A letter shall be sent to the Board of Directors of the A.R.R.L. protesting against the manner in which the increased 'phone allocation to U.S. amateurs in the 14 Mc/s band was brought into force without consulting other amateur societies. The letter also to urge the A.R.R.L. to consult with other I.A.R.U. Member Societies when a similar move affecting all societies is contemplated in the future.

(vi) Subscribing Member Societies shall continue to maintain close liaison with their respective administrations in order to preserve the amateur bands.

(vii) The present boundaries of I.A.R.U. Region I Division shall remain unaltered.

(viii) A co-ordinated Calendar of DX Contests shall be prepared in order to avoid clashes of date.

(ix) Subscribing Member Societies shall circulate amongst themselves or publish in a *Region I News Bulletin* at least 12 months in advance, the proposed dates of Contests of a DX nature (the Executive Committee is to co-ordinate this information).

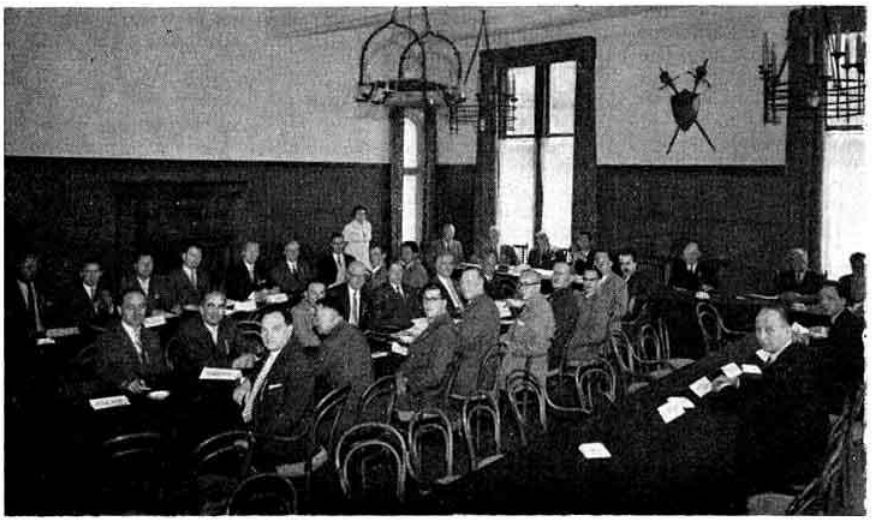
(x) Members of societies which are not Member Societies in the I.A.R.U. shall be permitted to compete in contests arranged by Region I Division.

(xi) A regular *News Bulletin* shall be issued and one member of the Executive Committee shall be responsible for its preparation.

(xii) The Executive Committee shall send out a questionnaire in order to obtain full information about the licensing regulations in the different countries of subscribing Member Societies: the information to be collated and issued to all Member Societies for use at their discretion. The Executive Committee to extract from this information an " ideal set " of standardized regulations which could be used as model regulations for the guidance of Member Societies when negotiating with their administrations.

The Committee reviewed fully the results of the Geneva Radio Conference and recorded their opinion that the cost of defending the amateur bands was fully justified.

The Committee took note that several administrations in Region I had already deprived amateurs of certain frequency bands or parts of bands in advance of the coming into force of the Geneva Radio Convention on May 1, 1961. The Committee noted with concern that in some countries administrations had not made available to amateurs the bands as set out in the Atlantic City Convention or had seriously reduced the use of such bands. The Committee decided to urge the National Amateur Radio Societies concerned to lodge a formal protest with their respective administrations.



The first Plenary meeting of the Folkestone I.A.R.U. Region I Conference on June 13, 1960.

* *Conference Secretary, Secretary I.A.R.U. Region I Division. General Secretary, R.S.G.B.*

The Committee received reports on the emergency Amateur Radio networks which operate in European countries. It was felt that this type of activity should be encouraged as a service offered to the Red Cross or other competent body by the amateurs themselves and that this activity should take place on amateur frequencies. The Committee were not in favour of any move (as suggested in Recommendation 33 of the Geneva Radio Regulations 1959) to allocate frequencies in amateur bands to the Red Cross or to any other similar body.

The Committee received from S.R.J. a lengthy document outlining the general policy to be adopted in the preservation of the amateur bands.

It was agreed to make every effort to contact amateurs in countries where there is no National Society in order to encourage them to form societies and to apply for membership of the I.A.R.U.

The Committee decided to emphasize to all Member Societies the urgent need to encourage their members to make full use of all the amateur bands, for example, the h.f. segments of 21 and 28 Mc/s.

The Committee adopted a new set of Rules governing the operation of I.A.R.U. Region I Division (a copy of the Rules can be obtained on application to the Secretary of the Division).

The Committee decided to draw the attention of the Conference to the number of almost worthless awards and certificates at present in circulation. The Conference took note of the views of the Committee and invited I.R.T.S. to bring the matter to the notice officially of the I.A.R.U. with a view to the preparation of a list of awards in good standing which could bear the official approval of I.A.R.U. Headquarters.

All delegations were agreed on the importance of continuing to report upon the presence of persistent intruders in exclusive amateur bands.

It was agreed that the Executive Committee shall examine the possibility of organizing a European " Foxhunting " Championship.

(A copy of the Minutes and Report of the Administrative & Operational Committee (Doc. 5/6) can be obtained from the Secretary, I.A.R.U. Region I Division, price 2/- post free.)

Technical Committee

This Committee met under the chairmanship of Mr. Jean-Claude Fouret (F8GB) with Mr. O. Ekblom (SM5KV) acting as Secretary.

The agenda covered a number of interesting subjects including the following:

(i) Technical standards appertaining to the use of RTTY (a paper presented by Dr. A. C. Gee (G2UK), Hon. Secretary, British Amateur Radio Teleprinter Group).

(ii) The narrow band image system of Amateur Television (a paper presented by Mr. John Plowman (G3AST) on behalf of the British Amateur Television Club).

(iii) The scientific listening to signals from interplanetary missiles.

In connection with (i) above the Committee agreed to urge Member Societies to seek authority from their licensing authorities for interested amateurs in their respective countries to use teleprinting, and, when authorized, to ask for facilities using the international code No. 2 with a 850 c/s shift for f.s.k.

In connection with (ii) above the Committee agreed, in view of the excellent results obtained by G3AST, to urge National Societies to encourage their members to develop the slow scan system of Amateur Television.

In connection with (iii) above the Committee agreed that I.A.R.U. Societies in Region I should study the possibilities of establishing a scientific network for the whole of the Region. The Committee took note of the part which the R.E.F. equivalent to the R.S.G.B. Radio Amateur Emergency Network plays in connection with the R.E.F. Scientific Network and recommended that emergency networks operated by other I.A.R.U. Member Societies should do likewise.

At the request of the Administrative & Operational Committee the Technical Committee gave consideration to the location of s.s.b. stations in the 14 Mc/s band. The Committee decided to recommend to the Plenary meeting that " two band areas should not be utilized because s.s.b. activity is naturally developing at the higher end of the band." The Plenary meeting accepted the recommendation and agreed to review the matter at the next Conference.

The Committee considered a specification for amateur transmitters as well as draft specifications for amateur receivers and aerial systems. The specifications (which had been prepared by the R.S.G.B. Technical Committee) did not appear to receive the support which had been anticipated. For example the specification for amateur transmitters (already published in the R.S.G.B. BULLETIN) was considered by some delegates to be far too stringent although other delegates agreed that better standards than at present in force were needed in the case of some commercially made amateur transmitters.

The Committee discussed at some length technical matters arising from the Geneva Radio Conference which might in the future affect the Amateur Service. A proposal to set up a sub-Committee to study the Geneva Radio Regulations concerned was not accepted by the final Plenary meeting.

A lengthy paper prepared by the Chairman of the R.S.G.B. TVI/BCI Committee dealing with interference by amateur transmitters to safety, broadcasting and other services was allowed to lie on the table until the next Conference. For some reason this important paper attracted no discussion and no questions were asked. It appeared to the R.S.G.B. delegates present at the meeting that the paper, because of its length, had not been thoroughly discussed by national societies prior to the Conference.

The R.E.F. paper on the scientific listening for signals from interplanetary missiles is being considered by the R.S.G.B. Scientific Studies Committee.

(A copy of the Minutes of the Technical Committee (Doc. F.C.9) can be obtained from the Secretary, I.A.R.U. Region I Committee, price 2/- post free.)

V.H.F. Committee

This Committee—which is a permanent Committee of the Division—met under the chairmanship of Dr. Karl Lickfeld (DL3FM) with Mr. F. G. Lambeth (G2AIW) acting as Secretary.

The Committee discussed a very wide variety of subjects of special interest to v.h.f. enthusiasts.

Recommendations adopted by the Committee and later accepted by the Conference at the final Plenary meeting included the following:

(i) I.A.R.U. Region I V.H.F. Contests will commence at 18.00 G.M.T. on Saturdays and end at 12.00 G.M.T. on Sundays.

(ii) Scoring for I.A.R.U. Region I V.H.F. Contests shall be on the basis of one point per kilometre.

(iii) All I.A.R.U. Region I V.H.F. Contests shall be phone and c.w. events.

(iv) Sub-regional V.H.F. Contests shall coincide exactly as to dates and times with National V.H.F. Contests, which can operate under different rules, except in the case of the I.A.R.U. Region I V.H.F. Contest when I.A.R.U. Region I rules must apply. (The V.H.F. Committee recommended that uniform rules be used for sub-regional V.H.F. Contests).

(v) The QRA Locator system shall be generally adopted by all amateurs in Region I.

(vi) The DX portion of the 420 Mc/s band shall be from 432 to 434 Mc/s as from May 1, 1961.

INTERNATIONAL GATHERING

From left to right: PA0DD, I1XCT, SP3PL, G2MI, SP5SB. Seated I1-10217, I1ZD. The ladies are Miss Gadsden, Mrs. I1ZCT and Mrs. I1ZD.

(vii) All 1250 Mc/s operators shall be urged to use the band between 1296 and 1298 Mc/s.
(viii) The 1961 meeting of V.H.F. Managers shall take place at Turin, Italy, during the Centenary Celebrations of the Union between Turin and Italy.

The Committee recommended that the Executive Committee shall issue certificates of merit to those amateurs who have made first contacts within Region I by unusual modes of propagation such as aurora, meteor scatter, sporadic *E* and moon bounce.

The Committee discussed Beacon Stations, Propagation Research, Meteor Scatter, Technical Liaison, Calling Systems, Certificate Claims, v.h.f. Trans-Atlantic Tests from the West of Ireland during 1962, v.h.f. band losses at Geneva, penalties for errors in contest entries, special v.h.f. licences, the dissemination of v.h.f. news on lower amateur frequency bands (3·5 and 14 Mc/s), the recognition of records and the issue of distance certificates, TVI problems affecting v.h.f. operations. Further information on these matters will be promulgated from time to time by national v.h.f. managers.

(A copy of the Minutes of the V.H.F. Committee (Doc. F.C.12) can be obtained from the Secretary, I.A.R.U. Region I Division, price 2/- post free.)

Other Business

The leader of the R.S.G.B. delegation (Mr. A. O. Milne G2MI) drew attention to the growing practice on the part o operators of certain " rare DX " stations to delegate to another amateur permission to prepare QSL cards confirming QSOs with the " rare DX " station.

Mr. Budlong stated that A.R.R.L. Headquarters were well aware of the problem mentioned by Mr. Milne but were powerless to take action. In connection with operating awards, however, they insist on receiving from the operator of the " rare DX " station a letter authorizing another named person to complete QSL cards on his behalf.

Conference Documents

A complete set of Conference Documents can be obtained from the Secretary, Region I Division, price 20/- post free. The documents run to more than 100 pages of typescript.

Communication Receiver Design Considerations

(Continued from page 63)

accurately on such things as low frequency rumble, mains hum or grid hum, low frequency parasitics and hum modulation of the suppressed carrier if the receiver audio response is not linear with frequency. Accordingly an output valve capable of handling the increased power, with a rating of approximately 2 watts, is preferred.

A modern miniature double triode with the two sections in cascade will give more than enough gain for all audio amplifier applications. This improves the flexibility and allows experimental work with different demodulators without having to worry about the required output voltage. It also leaves something in hand to allow the use of negative voltage feedback over all audio stages with obvious advantages from the viewpoint of lower distortion.

Chassis Construction

To the manufacturer, unit construction has many advantages. The complete transmitter or receiver can be subdivided into convenient self-contained and individually screened units. This gives improved production and greater flexibility allowing changes in specification or required modifications to be incorporated in one particular section without affecting the ouput of the remainder. Specialized test gear can be set up in the final inspection department and each sub-unit can be individually adjusted and tested for correct final performance. Any faulty unit can be quickly replaced without holding up the complete assembly.

To the Service customer or other large-scale user, unit construction has the advantage of enabling a faulty section to be quickly withdrawn and replaced by a serviceable item from stock. Speedy maintenance can be undertaken by semi-skilled personnel merely by disconnecting one unit and replacing with another one, and the complete transmitter or receiver maintained in almost continuous use.

However, these considerations are of no importance to the amateur constructor. A home-built receiver is a " one off " and spare units are not available from stock for quick interchange if a fault develops. The receiver will not be an exact copy of an original design. The amateur does not have special test equipment enabling each unit to be individually aligned and tested. All amateurs with past constructional experience incorporate " improvements " or modifications of their own. The components themselves will differ, both physically and electrically, from those used in the original design. Many items may be of surplus origin with performance no longer up to the original standard.

Final alignment and test will not be possible until the receiver is completely assembled and wired up, and it may be necessary to test voltages on individual valves and make adjustments to component values under working conditions.

Complete accessibility of all parts and the advantage of being able to get at the valve pins and i.f. transformer and coil connections with a test meter, or valve voltmeter probe, will be of major importance. It would appear then, that for an individual—and possibly experimental—communication receiver the open chassis form of construction still has some advantages.

* * *

In succeeding articles in this series, the circuitry of each stage in a communications receiver will be considered in detail.

Enquiries Regarding Bulletin Articles

MEMBERS who write to the authors of BULLETIN articles are asked to enclose stamped addressed envelopes if they require replies.

TECHNICAL TOPICS By PAT HAWKER (G3VA)

Safety in the Shack · Better Oscillator Stability · More on the Cathode-coupled Oscillator

New Phase Splitter · Transistors as D.C. Amplifiers · Learning Morse

SAFETY in the shack is a subject which should always be topical, but is also one about which there is a good deal of misconception. Every amateur soon learns to pay healthy respect to h.t. supplies of 350 volts or more—though, unless he develops a sound " safety discipline," may be prepared to take unnecessary risks from time to time; however, he will usually be well aware of the possible danger. But the Achilles' heel of many amateur stations and workshops, too often forgotten or disregarded, is the " live " (or more correctly the " line ") lead of the mains supply.

Every year there are over 100 fatalities from electric shock in the U.K. alone, the vast majority from 240 volt supplies. Indeed, there is some evidence to show that because of the different physiological effects, those who find themselves across voltages greater than 1,000 volts have a better chance of recovery than those subjected to severe medium voltage shocks. Even the 32 volt mains supplies in some

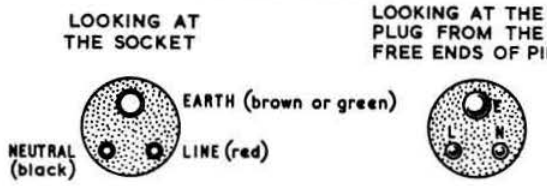


Fig. 1. The correct wiring for three-pin plugs and sockets. To test that a socket is correctly wired, a lamp should light if connected between " L" and " N" or " L" and " E" but not when connected between " N" and " E." A neon bulb will glow when touched against " L."

American farm areas have been known to prove lethal. As the jingle says, " It's volts that jolts, but mils that kills."

Clearly, the real danger from mains supplies is where either the skin resistance is lowered by dampness or perspiration, or where the victim firmly grips an extensive area of " live " metal while in good contact with earth. It is against this second possibility that particular care is necessary in amateur shacks.

One hazard is equipment with a mains-connected chassis used under conditions for which it was not intended. *All* modern British television sets and a fair proportion of domestic radio receivers fall into this category: not only all the " a.c./d.c." sets but also—and this is not always appreciated—a goodly proportion of " a.c. only " models. These sets are nowadays usually built strictly to comply with the British Standards safety specification (B.S.415) which, among many other precautions, lays down that it should be impossible for a " little finger " to touch any part of the chassis and also insists on double-pole on-off switches. But old radio sets, particularly pre-war models, often do not comply with B.S.415, or may have damaged " card backs " or be used with exposed control spindles or grub screws. If there is any such equipment around your shack make sure, by checking with a neon bulb, that the exposed parts are not " live " with the on/off switch in both positions (remember that a single-pole switch in a neutral lead will leave the chassis " live " with the set off even if the chassis is connected to " neutral " when the set is on). After checking, fit a non-reversible mains plug. It is also well worth while to ensure that all three-pin mains sockets in the shack (and in the house generally) are wired correctly: unfortunately many sockets in our homes are wrongly wired. A three-pin *socket* with the thick " earth " socket on top should have the " neutral " socket on the bottom left, and the " line " socket (i.e., the live one) on the bottom right—these directions are when looking into the socket and must be reversed when looking at the back of a socket for wiring. Correct colour coding of leads in the U.K. is: " line," red; " neutral," black; " earth " brown or green: see Fig. 1.

But an even greater hazard, because seldom anticipated, can arise under " fault conditions " on equipment fitted with a double wound (i.e. isolating) mains transformer, as used in the vast majority of amateur receivers and transmitters. It is by no means unknown (yes, it *has* happened at G3VA) for the primary winding to short-circuit to the screening plate between primary and secondary, the core or to one of the secondary windings, so that the chassis of the equipment becomes " live." Such equipment will often continue to operate quite normally and can thus represent a real danger over a considerable period. The best safeguard against this is to ensure that the shield between the primary and the other windings, the core and the chassis are all effectively earthed. The earth connection *must* be of sufficiently low resistance to cause the supply fuses (which should always be the minimum amperage practicable) to blow. It is no use having a 50 ohm resistance to earth and a 10 amp fuse—if this is the case you may be surprised at the size of your quarterly electricity bills but the hazard is quite likely to remain undetected.

Another potential danger is the electric tool which has faulted and which has a " live " outer casing. This can happen, for example, with soldering irons and power drills. The modern domestic drill of reputable make is designed with this danger very much in mind but even so it should be remembered that in industry it is often recommended that such tools should be used only in " earth free " areas—which is very far from being the case in the average amateur shack. Keep a careful eye on the state of all flex cords and investigate immediately if any " tingles " are noticed when using power tools.

Many amateurs fit extra sockets in their shacks and the control arrangements may call for quite a lot of semi-permanent a.c. wiring and switching. These should always conform with the high standards laid down in the I.E.E. Wiring Regulations (13th edition). These are rather formidable reading for the non-professional but a number of books giving sound advice on modern wiring practice, based on the I.E.E. recommendations, have been published and can often be obtained from local libraries*. If in any doubt get expert advice.

Without wishing to be unduly gloomy, it may also be prudent to re-read occasionally the excellent article " The Treatment of Electric Shock " by Dr. Gee (G2UK) published in the BULLETIN (January, 1957) and to bring it to the attention of someone else in the house. A 20 in. × 15 in. instruction chart "Apparent Death from Electric Shock " giving information on the Holger Nielsen system of artificial respiration is available by post for 11d. (or mounted at

* For example, *Modern Wiring Practice* by W. E. Steward (Newnes).

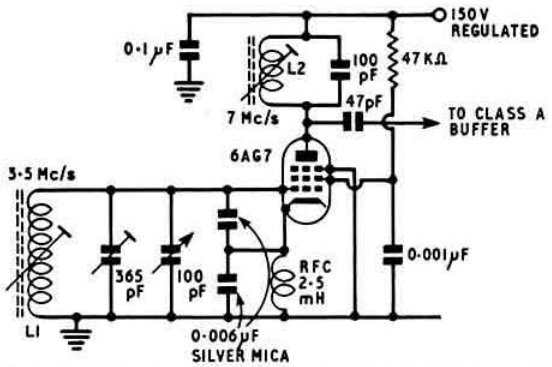


Fig. 2. K9BDO's class A oscillator described in CQ, June 1960. L1 is given as five turns, 24 s.w.g. (U.S.A.) enamelled, ¼ in. diameter, spaced ½ in. on a ceramic slug tuned former mounted at least 1 in. from any metal. L2 is 16 turns, 24 s.w.g. (U.S.A.) enamelled, ¼ in. diameter, close-wound on a ceramic slug-tuned former.

6/6 or, on aluminium, 9/6) from *Electrical Review*, Dorset House, Stamford Street, London, S.E.1. Some practical safety hints, including the frequent use of one of the readily available neon-fitted screwdrivers, were given in *Wireless and Electrical Trader* (August 22, 1959). Salient information is also to be found in " Electrical Shock—Fact and Fiction " (*Electronics World*, May 1959, and available as a reprint).

For a detailed description of two effective resuscitation techniques—the " back pressure arm lift " method and the " mouth to mouth " method—see *Electronics World* (December 1959).

Better Oscillator Stability

The classic quest for better oscillator stability is given another dusting off by K9BDO in *CQ* (June, 1960) who comes up with a new class A Colpitts circuit (see also *Technical Topics*, July 1958). Fig. 2 shows his oscillator which should be followed by a conventional class A untuned buffer stage. At a first glance it may look very familiar but the points to note are the absence of a grid capacitor and grid leak and the extremely high swamping capacitance across the low-L tuned circuit (greater than 3000 pF). The grid is thus fed at very low impedance, about 20 ohms, almost completely eliminating the effects of changes in valve inter-electrode capacitances and characteristics. With normal v.f.o. constructional practices, K9BDO claims that this circuit gives a total drift of less than 500 c/s at 7 Mc/s and that this figure could be bettered if necessary. This order of stability is said to permit the use of the v.f.o. for s.s.b. operation up to about 21 Mc/s.

But as we pull crystals out of the transmitter, back they go into the receiver. W4TKR, in *QST* (May, 1960), describes a crystal-controlled h.f. oscillator of particular application to high performance converters for 14, 21 and 28 Mc/s having an " i.f." output starting at approximately 3·5 Mc/s (there will be a slightly different displacement of the band edges on the three bands due to the " overtone " effect). The circuit, shown in Fig. 3, is largely self-explanatory.

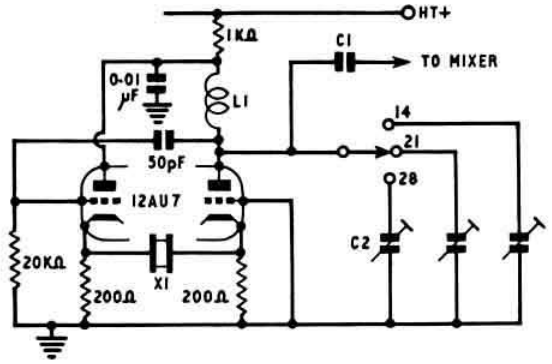


Fig. 3. According to QST, May 1960, W4TKR favours this single crystal overtone oscillator providing outputs at 10·5 Mc/s (for 14 Mc/s), 17·5 Mc/s (for 21 Mc/s) and 24·5 Mc/s (for 28 Mc/s) with one 3·5 Mc/s crystal for use in a high performance converter. L1 is adjusted to 24·5 Mc/s with a low value of C2. C1 should be adjusted to give the desired coupling to the mixer. X1 should be about 3500 kc/s.

The Cathode-coupled Oscillator

Every amateur receiver, however, must have one or more variable L-C oscillators. In this connection, G2UJ, who has used one for several years, confirms that the cathode-coupled oscillator (*Technical Topics*, June, 1960 and Fig. 4) is exceptionally useful and satisfactory. Relatively little constructional information on this type of oscillator appears to have been published, so G2UJ's hints are of particular interest. He makes the following comments and suggestions:

(i) The circuit is very tolerant of high C operation, a useful feature where a wide range oscillator is required.

(ii) Under certain conditions the circuit may " squegger," particularly if the grid coupling capacitor is increased much

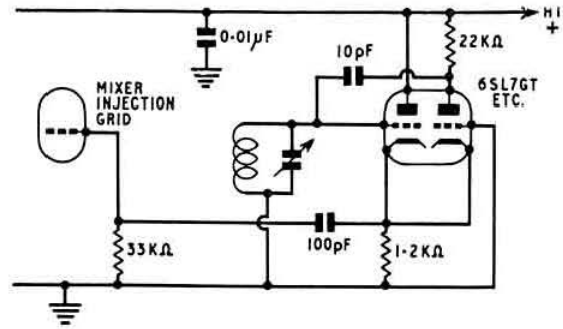


Fig. 4. The cathode coupled oscillator described in CQ, April 1960. G2UJ provides some useful constructional tips on this type of oscillator.

beyond the suggested 10 pF. A small non-inductive resistor of, say, 10 to 50 ohms will cure this and enable a nearly constant output to be obtained over several bands without altering the grid capacitor. If a multi-band oscillator with switched grid circuit is required, it is advisable to set up the circuit first with a 3-30 pF variable trimmer and to experiment with different settings and/or different series resistors on the highest and lowest frequencies required, replacing the trimmer with a fixed type when a suitable value has been found. The value, however, is not really critical.

(iii) The h.t. by-pass capacitor should be connected directly between the " free " anode and the earthing point of the oscillator to ensure low harmonic output. For harmonic suppression, the series inductance of the capacitor is more important than its actual value and it is worth trying different physical types. For instance, a cylindrical paper capacitor, particularly if in an earthed metal casing, may be found superior to a silver-mica type, whereas with different makes the opposite might be true. Hi-*K* ceramic types seem unsuitable for this application. A combination of different types sometimes proves most satisfactory. Using a 6J6 as the second oscillator (1685 kc/s) in a double conversion receiver, G2UJ found that by paying particular attention to this point, he was able to eliminate entirely *all* harmonic responses from the oscillator on all bands up to 34 Mc/s although the set tunes through every harmonic

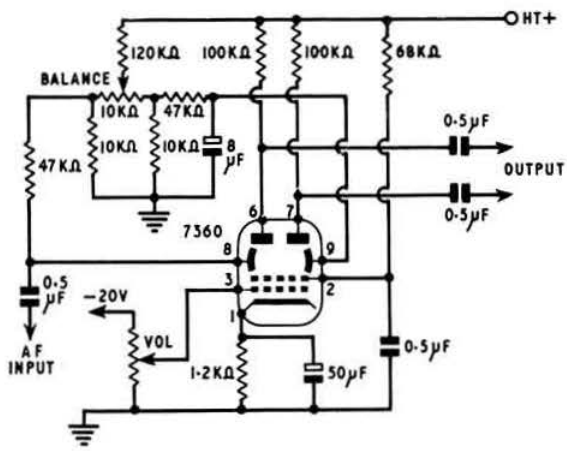


Fig. 5. A new phase splitter for high fidelity based on the R.C.A.7360 beam deflection valve.

frequency. In this case, the best by-pass capacitor was a physically large stacked foil and mica type. A 5K ohm resistor in the "free" anode circuit also proved advantageous.

Thanks G2UJ for these useful notes.

New Phase Splitter

With the almost continuous introduction of new types of valves, it is hard to keep abreast of the new and adapted circuits which they make possible; the more so since American valves and semi-conductors can now be imported without great difficulty. For instance, the new R.C.A. type 7360 (described in *CQ*, May 1960) is an ingenious beam deflection tube almost ideal for the ZL1AAX product detector (*Technical Topics*, September, 1959) and for various s.s.b. applications. It also appears to have a useful application as an improved form of phase splitter for hi-fi audio work (see Fig. 5), though it is susceptible to stray magnetic fields. The relative potentials applied to the deflection grids (pins 8, 9) govern the distribution of the electron stream from the single cathode between the two anodes.

W7CSD in *CQ* (June, 1960) shows how the little-known 6AS7G valve, which is notable for a very low cathode to anode resistance and which thus has a voltage drop of less than 50 volts, can be used in a QRP rig as a series modulator arranged to provide a simple form of "ultra modulation" with 200 per cent positive peaks compared with just under 100 per cent negative peaks. This might be particularly useful for effective mobile work.

Transistors as D.C. Amplifiers

There are several ways in which surplus a.f. junction transistors—now available at around 5s. each—can be used in simple indicator and monitor circuits to improve sensitivity, especially where this feature is of more importance than accuracy of calibration. Fig. 6 shows a typical field strength meter or harmonic checker (derived from one given in the book *Transistors—Theory and Practice*) in which a stage of d.c. amplification can give to a 1 mA f.s.d. meter an effective sensitivity of the order of 25 μA f.s.d.

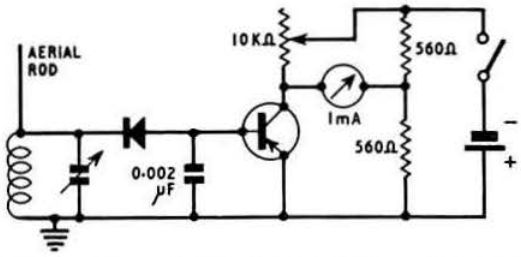


Fig. 6. A sensitive crystal diode checker or field strength meter using an a.f. transistor as a d.c. amplifier. The variable 10K ohm resistor provides zero adjustment.

Learning Morse

G3HSC reminds us that the initial teaching of Morse by sending letters at the full examination speed with long pauses (see *Technical Topics*, June 1960) is not new or an exclusively American technique. For some years his own training records (obtainable from Belding and Bennett Ltd., 53 Woodcote Road, Wallington, Surrey) have used this system and have helped many hundreds of newcomers to master the code.

Also Noted

G3JGO points out that the recent note on peak inverse voltages across rectifiers (*T.T.*, June 1960) should have made clear that the figures given apply only to half-wave rectification: with a full-wave (bi-phase) arrangement the p.i.v. across each rectifier will be equal to $\sqrt{2}$ times the full secondary winding voltage (e.g. $\sqrt{2} \times 500$ volts for a 250-0-250 volt transformer) regardless of the presence or otherwise of the reservoir capacitor. . . . For those who like winding their own transformers, D. Saull gives useful information on small power transformers (8-150 VA) in *Wireless World*, June 1960 and on audio transformers in *Practical Wireless*, July 1960. . . . Mobileers—and there are now some 850 /M licences in the U.K.—and other users of short vertical aerials may find "Antenna Design for Maximum L.F. Radiation" (*Electronics*, June 3, 1960) of interest: although directed primarily at frequencies of about 150 kc/s it gives results of a series of 1/10 scale tests with a 15 ft. radiator on 1·5 Mc/s. For example, radiation efficiency of the simple vertical is given as 15 per cent; with an umbrella (44° apex angle) as a capacitive "top hat," the figure rises to 53 per cent; when a loading coil is placed immediately below the umbrella, efficiency goes up to 72 per cent. Outriggers and a larger umbrella can give a 92 per cent efficiency. . . . The brass-bristle brushes used for suede shoes make it easy to keep "bits" really clean while soldering. . . . In the States, midget 1 oz. transmitters capable of operating for a month are being attached to birds to study their movements—suppose there will be a "Worked All Feathered Friends" certificate soon!

Intermediate Frequency List

TWO corrections should be made to the intermediate frequency list published on page 27 of the July BULLETIN. The i.f. for the Tobe pre-war communication receivers was 465 kc/s and not 456 kc/s. The BC348 (i.f. 915 kc/s) was listed as the "BC448."

Single Sideband

By G. R. B. THORNLEY (G2DAF)*

TUNING single sideband signals still appears to give many operators considerable trouble and it may therefore be worth giving the procedure once again before going on to describe some more receiver alterations.

Operating Procedure

The correct operating procedure with an existing receiver is to switch off the a.v.c., switch on the b.f.o., turn the audio gain control full on and use the r.f. gain control as the volume control. In the AR88 and CR100 turn the selectivity switch to the crystal " in " position (position 3 or 4). If it is still not possible to resolve s.s.b. signals satisfactorily the most likely cause of failure will be misalignment of the b.f.o., and hence the inability to position the carrier on the correct frequency at either side of the pass band.

The recommended setting up procedure is as follows: (i) Remove the b.f.o. can and position the variable trimmer capacitor so that the moving vanes are half mesh. At the same time re-position the panel control knob so that the knob pointer is at exactly 12 o'clock. Replace the screening can; (ii) Tune the receiver to a steady B.B.C. medium wave broadcast (preferably on a speech programme) for the maximum S meter reading with the selectivity switch in the position that will be used for sideband reception (position 3 or 4). The B.B.C. carrier will now be in the centre of the i.f. pass band; (iii) Switch the a.v.c. off and the b.f.o. on, and adjust the dust core in the b.f.o. coil for zero beat. The b.f.o. carrier will now be in the centre of the pass band with the control knob pointer at 12 o'clock; (iv) Make sure the detector is not being overloaded by turning the audio gain control full on and using the r.f. gain as the volume control. Turn the b.f.o. knob *slowly* towards 3 o'clock *at the same time* re-adjusting the main tuning to maintain the two carriers (B.B.C. and b.f.o.) at zero beat. At some position of the two controls the distorted audio will resolve into clear and natural speech. You are now receiving one sideband of the B.B.C. transmission. Mark the position of the b.f.o. pointer by scribing a line on the front panel; (v) Repeat the procedure by turning the b.f.o. pointer the other way, towards 9 o'clock. You are now receiving the other sideband of the B.B.C. transmission. Mark the panel to show this b.f.o. pointer position; (vi) You now have the two correct settings of the b.f.o. for the reception of a single sideband signal. One mark will give *low* sideband reception and the other mark *high* sideband reception. Find which is which by listening to the 3·7 Mc/s (lower sideband) and 14 Mc/s (higher sideband) s.s.b. stations and mark the panel accordingly with the letters " L " and " H."; (vii) During reception, once the b.f.o. has been set on the correct mark, it should not be touched again. Any correction necessary to bring voices to the natural pitch should be done on the *main* tuning control.

General Considerations

The major disadvantage of CR100, AR88 and similar receivers is the course tuning rate. This is generally satisfactory on the lower frequencies but is likely to be tricky to tune on the DX bands. It is not possible to do much about this, other than perhaps fitting a small vernier control on the front panel connected in parallel with the v.f.o. section of the main tuning capacitor. (A suitable value for this would be a small variable capacitor of 10 to 25 pF maximum capacity.) Perhaps the best solution for reception on the higher frequency bands is to use the main receiver as a tunable i.f., covering say 5·0 to 5·5 Mc/s and build an external crystal-controlled converter to translate 14, 21 and 28 Mc/s down to the i.f. tuning range. If there is any appreciable v.f.o. or b.f.o. drift (or both) it is worth while fitting a VR150 stabilizer in the main h.t. line and feeding both these oscillators from the regulated source. Although not essential, an added refinement is to improve the skirt selectivity and give a flatter top to the pass band by taking out the existing single crystal and phasing capacitor and replacing with a half-lattice filter using two adjacent channel FT241 crystals: channels 45 and 46 or 46 and 47 if the i.f. is 455 kc/s and channels 51 and 52 if the i.f. is 465 kc/s. For the AR88LF using an i.f. of 735 kc/s the crystals necessary are FT241 type 96th harmonic, channels 70·5 and 70·7.

When trying out the receiver for single sideband reception remember that it has been internationally agreed that all s.s.b. transmissions below 10 Mc/s should use the lower sideband, and above 10 Mc/s the higher sideband. This means that on 1·8, 3·5 and 7 Mc/s the b.f.o. pointer will be set to the position marked " L " and on 14, 21 and 28 Mc/s it will be set to the position marked " H."

S.S.B. transmissions vary in quality just like a.m. ones. Some are good—and some are exceedingly bad. The finest sideband receiver ever made just could not produce good quality from some stations—this applies particularly to the DX bands. Don't condemn the receiver if a sideband station sounds rough, and you hear the man he is working report, " You are S9 plus 40db and a beautiful transmission, OM." Remember that the reporting station is most anxious to get a QSL card, so take what he says with a large pinch of salt!

There are also certain stations using d.s.b. (double sideband suppressed carrier) transmitters and these cannot be resolved really satisfactorily without a selectable sideband receiver. This is a receiver with sufficient i.f. selectivity to attenuate one sideband 50 or 60db down, so that the input signal is actually demodulated as a single sideband transmission. You can spot these by changing sidebands on your receiver (remember to correct the main tuning control). If the transmission is d.s.b. both sidebands will be the same strength.

In conclusion remember that the single sideband method of reception can be used on normal a.m. or c.w. transmissions with the great advantage of the improved receiver selectivity and the ability to change sidebands to dodge a strong adjacent channel heterodyne or to avoid splatter. Remember also, if you are still at heart a c.w. enthusiast, it is well worth your while going all the way to make your CR100, AR88 or similar, into a real selectable sideband receiver by fitting two or three half-lattice filter sections in the i.f. amplifier, (the same bandwidth you would use for phone—2·5 kc/s). This will give you something you have probably dreamed about for a long time—real " single signal " c.w. reception.

After trying out the reception of one sideband on local a.m. nets you will realize that the frequency stability of many stations is regretably low. You will also note that it is common for many local nets of three or four a.m. stations to be so spread out they are occupying 20 kc/s of band space instead of 5 or 6 kc/s. You may even resolve to check your own transmitter v.f.o. as well! Modern band conditions require a high degree of receiver selectivity and this in turn requires a much higher degree of transmitter stability than has been customary in the past. Aside from any argument about the relative merits or otherwise of single sideband, any improvement in this direction means more band space and less interference and is therefore of benefit to all.

* *5 Janice Drive, Fulwood, Preston, Lancashire.*

The MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN) *

MANY operators on the h.f. bands seek contacts to enable them to qualify for one of the many certificates now available and, despite scorn from the disinterested, a considerable number of amateurs participate in this activity. In order to make claims for these certificates generally it is necessary to produce confirmation of contacts for scrutiny by the issuing organisation. This is only one of the reasons why operators should adopt an honest policy with regard to the despatch of QSL cards. If *you* do not intend to QSL this should be mentioned during the course of a contact, so that waste of postage and subsequent frustration can be avoided. If it has been said that a QSL will be sent, either immediately or on receipt of a card from the other station, the operator concerned should fulfil his spoken promise.

Whilst on the subject of QSL cards readers will have noticed that there has been a large and recent increase in the number of " managers " who handle cards for rare DX stations. In many cases the existence of a manager makes all the difference between the receipt or non-receipt of a QSL from the station concerned but unfortunately the practice could be abused. Again, honesty is the best policy; an unjustified QSL will deceive nobody, least of all the recipient.

Local Contacts on 28 Mc/s

It is suggested that during the period of low DX activity on 28 Mc/s the band should be used more frequently for " cross town " working. A great number of local contacts are made on the 200 kc/s (shared) of the 1·8 Mc/s band whilst the 2,000 kc/s of 28 Mc/s is relatively unused when the band is not open for DX. This, combined with the ease of erecting efficient aerials and the freedom from interference, makes the 28 Mc/s band an attractive proposition for short distance ground wave working, such as club nets and for mobile operation. For the latter, it is particularly attractive because a full size quarter wave aerial can be used.

News from Overseas

ZD2JM, John Macintyre, promises to make every effort in the next few months to catch up on his backlog of QSLs, due mainly to having been away from his home a great deal. John is now in Lagos and his new QTH and also that of his QSL manager for W/K stations will be found in *QTH Corner*.

VS9AE, Iain Dunbar, is now stationed in Iran and hopes to be active again shortly subject to receiving permission from the Iranian authorities.

ZC4GB, Geoff Blunt, is returning to the U.K. and states that all contacts have been acknowledged.

ZL2GX is now the QSL manager for ZL4JF, ZL3VB, ZL5AA, ZL5AC and VR1D. The last mentioned, on Ellis Island, will be there for at least a year.

VE2BEV is the new call of Jim Hatch (ex-B.R.S.21236), formerly of Slough, who is looking for G contacts on 21 and 28 Mc/s.

G3NVM on board the *S.T. World Justice* and writing from the Persian Gulf, has the good intention of bringing his QSLs up to date when next on leave. In the meantime he hopes that permission will be forthcoming to operate /MM.

Globetrotter Rundy **(W3ZA)** visited Khartoum from June 22-30 and he and Eric (ST2AR) operated the KWM-1 from the latter's QTH. Using a single element quad for 14 and 21 Mc/s, 68 countries were worked during the eight days. ST2AR hopes to be on s.s.b. permanently in the near future. W/K, VE and 4X4 stations are asked to QSL via W2JXH, and others direct to ST2AR at the address given in *QTH Corner*. Stations desiring a direct QSL should enclose I.R.C.

G3MIU/EI9AF, writing from Fribourg, Switzerland, tells of the 600 contacts made during N.F.D. on June 12 by HB1FE which was the highest scoring HB station. Photos show a wonderful QTH 3,600 ft. above sea level. The operators of HB1FE complain of the slowness of G stations to QSY after completion of a QSO.

W8UTQ/3V8, Syd Wagoner, has been putting in a very potent s.s.b. signal from Tunis using a 32S1 and a 14 Mc/s dipole. According to present plans he will be there for about a year.

K9VRV/4, Pete Smith, formerly K5KYR of New Mexico, has sent out a large number of cards direct but any station still needing his QSL should write to 1944 Richmond Avenue, Petersburg, Va. For those needing New Mexico for W.A.S. **K5MXS** of Albuquerque, will keep schedules. He invariably QSLs direct. Pete mentions poor QSL returns and hopes that some of the missing cards may yet turn up.

MP4s BDA (Bahrein), MAB (Muscat Oman), QAO (Qatar), TAE (Trucial Oman) and MAB/P (Yemen) are all calls held by Bryan Bisley. B.R.S.21457, Roger Baines, whose address will be found in *QTH Corner*, holds the logs for the three trips to the Yemen. Cards will be sent direct where return postage is included, otherwise through the R.S.G.B. Bureau. Bryan asks that stations do not call him on his own frequency.

DXpeditions

VQ9TED will be operating from the Seychelles from about August 16. Trips to other DXotic parts are promised.

If separate country status is assured by A.R.R.L. **CR6CA** plans a six week trip to CR5 and the Annobon Islands (EA0). An HT32 will provide the r.f.

The **EI0AA** jaunt to the Blasket Islands went off well with 580 contacts logged, despite a trip into the sea by the generator when unloading.

DXotic Showcase

Call-sign	k/cs	Mode	G.M.T.	Country
FF7AB	28,432	a.m.	15.25	Mauretania.
CR5AR	21,040	c.w.	20.15	Sao Thome.
FK8AT	21,255	a.m.	13.55	New Caledonia.
KC6RF	21,305	a.m.	15.15	E. Caroline Is.
KG4AO	21,190	a.m.	23.05	Guantanamo Bay.
VP2GU	21,150	a.m.	00.45	Granada.
VR2DE	21,215	a.m.	07.50	Fiji Is.
9N1MM	21,300	a.m.	16.00	Nepal.
4S7YL	21,300	a.m.	17.50	Ceylon.
JT1KAC	14,025	c.w.	18.26	Mongolia.
PY7LJ	14,058	c.w.	20.38	Fernando de Noronha
VS5GS	14,110	c.w.	16.25	Brunei.
ZL4JF	14,110	c.w.	08.40	Campbell Is.
6O2AB	14,063	c.w.	20.00	Somalia Republic.
KG6ICD	14,305	s.s.b.	18.30	Marcus Is.
MP4MAB/4WI	14,296	s.s.b.	17.10	Yemen.

* *Please send all reports to R.S.G.B. Headquarters to arrive not later than August 18.*

It is believed that W9EVI has Bajo Nueva intentions for February 1961 under the call **HK0DA.**

9N1GW should be active from East Pakistan and possibly AC3 during September.

Rundy, W3ZA, has permission to operate under the call **FL8ZA,** and the KWM-1 will be heard from French Somaliland during December. Incidentally, Rundy also holds the following calls: MP4BDD (Bahrein), MP4MAG (Muscat) MP4TAI (Trucial Oman) and MP4QAQ (Qatar). The only call so far activated is that for Qatar.

After a stay in the Canal Zone the *Yasme III* will go to the Galapagos Is. for about two weeks, probably followed by periods of operation from Clipperton Is. and the Marquesa group.

The Marcus Island **(KG6ICD)** station made 2,300 contacts with 85 countries during the time spent on the island. QSLs are now being despatched.

HP1HC/1, worked by G3AAE, was located on Taboga Is., about 16 miles off the Pacific coast of Panama, while investigating the possibilities of a DXpedition to this location.

W2HLL, K2SGO, K2UTN and K2TBU will be operating from **FP8** for four days from August 26. C.w. will be used on 7003-7010, 14020-14030 and 21020-21030 kc/s and s.s.b. on 7200-7220, 14300-14310, 21400-21410 and 28,650 kc/s.

ZE3JO and ZE3JJ will be on **ZD6** from September 5-15, using all bands and modes.

DXCC News

From a W1AW bulletin the following official changes are noted.

Additions, to become effective for DXCC credit with effect from November 1, 1960 are as follows: Marcus Island (contacts after November 16, 1945), Mali Federation (after June 20, 1960), Mauritania (after June 20, 1960), Ruanda-Urundi (after July 1, 1960) and Somalia Republic (after July 1, 1960).

The following territories have been deleted from the country list: Italian Somaliland and British Somaliland, the Karelo-Finnish Republic (this will now be counted as European U.S.S.R.), Tangier (to count as Morocco), Wrangel Island. Effective immediately Cayman Is. resume their pre-June 1958 status.

QTH Corner

BV3HPT	Box 11, Shin-ti-en, Taiwan.
CP5EL	P.O. Box 1088, Cochabamba, Bolivia.
EA0AB	P.O. Box 195, Santa Isabel.
HC5BZ	P.O. Box 790, Cuenca, Ecuador.
HC6KA	P.O. Box 1332, Quito.
JT1AW	Box 639, Ulan Bator.
JT1KAC	Box 708, Ulan Bator.
KG4AB	Box 19
KG4AG	Box 41
KG4AM	Box 32
KG4AO	Box 55
	Navy 115, FPO, New York, N.Y.
KZ5BA	P.O. Box 63, Margasita, Canal Zone.
MP4BDA	R. Baines, 56 Balmoral Road, Gillingham, Kent.
OA1W	International Petroleum Co., Talara, Piura, Peru.
PZ1BE	P.O. Box 931, Paramaribo, Surinam.
TF2WEZ	MARS Base, A.P.O. 81, New York, N.Y.
UR2AR	Enn Lohk, Box 137, Tallin, Estonia, U.S.S.R.
VK0WH	via VK2AWH.
VP2LS	P.O. Box 171, Castries, St. Lucia, B.W.I.
VP3IG	P.O. Box 331, Georgetown.
VP8DW	P.O. Box 185, Port Stanley, Falkland Is.
VQ3HZ	P.O. Box 120, Mwanza.
VR1D	via ZL2GX.
VS5AD	Box 124, Brunei.
VS9AE	Iain Dunbar, Icharg Island, Iranian Oil Exploration-Producing Co., Abadan, S. Iran.
W8UTQ/3V8	S. Wagoner, U.S. Embassy, Tunis, Tunisia.
YA2BC	Box 136, Kabul, Afghanistan.
YN1AW	P.O. Box 2113, Managua, Nicaragua.
YV3AS	P.O. Box 13, Barquisimeto, Venezuela.
ZA2BAK	Major M. Bakiri, K. K. Perpjitheshem, SHNUM, Tirana, Albania.
ZD2JM	c/o Asst. Engineer-in-Chief (Radio), Posts and Telegraphs H.Q., Lagos, Nigeria.
ZD2JM	(W and K stations) via K9EAB, 711 W. McClure Avenue, Peoria, Illinois, U.S.A.
5A5TR	P.O. Box 170, Tripoli, Libya.

Lee Roy (Scotty) Scott has been operating since 1922 with such calls as 5ANY, NU5ANY and W5ANY. Now resident in Silver Springs, Maryland, Scotty signs W3PGB and with this very imposing layout has acquired all the major DX operating awards available, but as can be seen from the photograph he has given pride of place to the Society's Empire DX Certificate. Equipment in current use includes a Collins 32V3 transmitter and 75A4 receiver and Collins "S" line equipment, while the aerials are rotary beams.

Contests and Awards

A reminder that the **First Asian DX Contest** will be held from 10.00 G.M.T., August 27 to 16.00, August 28. C.w. only. Copies of the rules for this contest and for the **Scandinavian Activity Contest** (September 17/18 and 24/25) are available from G2BVN. Please enclose a s.a.e.

The **VK/ZL Contest** dates are: Phone, 10.00 October 1 to 10.00 October 2; C.w., the same times on October 8/9. Logs should be sent to the N.Z.A.R.T., Box 489, Wellington, New Zealand.

That popular affray, the *CQ* **W.W.DX Contest** will be held during the weekends October 29/31 (Phone), and November 26/28 (c.w.). Further information later. In the meantime log sheets and report forms can be obtained by sending I.R.C. to *CQ Magazine*, 300 West 43rd St., New York 36, N.Y., U.S.A.

Applications for the **WASM Awards** should now be sent to the S.S.A. Diploma Manager, Stockholm 4, Sweden.

Applications to the **Okinawa Amateur Radio Club** for the certificate issued by them have gone unanswered and QSL cards have not been returned. Cards sent to the Brazilian society for the **WAA award** have gone astray. There is a delay of several months in correspondence.

DX Briefs

W9KOK has the logs of **AC4YN** and will answer outstanding QSLs direct if accompanied by s.a.e. and I.R.C.s. **5A5TR** is ex-YA1IW and will deal with any missing QSLs if enquiries are directed to P.O. Box 170, Tripoli, Libya.

VP5WB is in the U.K. until September 3, but will be active again shortly after his return on September 26. **G3AGG,** now unfortunately in hospital, will deal with his outstanding QSLs as soon as possible.

QSLs for contacts with **VS9AZ** should go to Aden or through the R.S.G.B. Bureau.

The only station operating from Vatican City, **HV1CN,** can often be heard on the 21 Mc/s band between 16.00 and 18.00 G.M.T. a.m. or s.s.b.

B.E.R.S.195, mentioning his countries standing as 267/253,

says that QSLs for VK0AF and VK0RO may be sent to him at 340 Gillies St., Thornbury N.17, Victoria, Australia. In response to a query from Eric and others, Gold Coast (ZD4) and Ghana (9G1) count as two countries for DXCC. Similarly, Guinea, formerly part of FF8, and now 7G1 and an independent Republic, also counts twice.

ZL4JF is proving difficult to work from G although his signals are often heard in the early mornings when working North American stations. There is no mail service to Campbell Island and cards should therefore go to ZL2GX.

In addition to VQ4AQ mentioned last month, it is understood that **ZL2GX** has also received QSLs from 300 different countries. Congratulations Jock.

W6KUT has dispensed all the cards for the **FD8AMS** operation and the logs have been returned to ZD2AMS.

New Prefixes

New prefixes causing queries are: 9Q5 (Republic of Congo) 9U5 (Ruanda-Urundi), 6O1 and 6O2 (Somalia Republic); OR4TX (Princess Ragnhild-Land) is in Zone 13.

Band Reports

28 Mc/s

Reports are few for this band and practically no DX has been worked.

G3MVV (Romford) worked VQ3PBD (16.20). **G3IPV/MA** (Portsmouth) lists OK1ACF (18.25) and other Europeans on c.w. **G3AAE** (Coulsdon) conversed with FF7AB (15.25), a separate country since June 20. The southerly path from the U.S.A. is still open and **F.R.S.309** (Virginia) reports YN1AW (21.40), YV1AC (21.37), YV3CN (04.52), VP6EB (14.59), KZ5GH (14.58) and YV6BP (14.50).

21 Mc/s

Conditions have fluctuated from excellent to rock bottom on this band and it has been largely a matter of luck if one operated at the right time.

To most of us the Pacific path has appeared closed but **G3FPQ** (Elstead) would have it otherwise to the tune of FK8AT (09.00), KC6RF (East Carolines, 15.15), VR2DE (07.50) and four KH6s between 08.00 and 09.00. VS5GS (16.25) and 9U5JH (18.40) complete the picture on phone whilst c.w. accounted for CR5AR (20.15), ST2AR (15.00) and VS9MB (17.35). A3 from **G3MVV** was received at KZ5BA (22.40), HV1CN (14.05), 4S7YR (17.50), VS5GS (16.35), VP2GU (00.45), VU2BK (11.50), KG4AO (23.05), OA1W (00.50) and PZ1BE (23.50). **G3AAE** keyed with VQ8AM (16.20), VQ3HZ (16.42), YA1BW (18.30), 9Q5RU (19.28), UA0BC (15.52), DXpedition PX1PF (14.00), and W6GRF/MM (20.02) 950 miles east of Japan, with phone reports from 9N1MM (16.00), 9Q5VH (20.10), 9U5BH (12.40), VK8NE (22.02), and OR4TX (15.52).

John Wightman, ZL1AH (ex-G3AH) of Welcome Bay, Tauranga, New Zealand, has been six times winner of the c.w. section of the VK/ZL DX Contest. He is also well known on Top Band where he was the first ZL to work G, W and VS6. The two G6GN cards visible in the picture confirm the first two G/ZL QSOs on the band.

The majority of the s.w.l. reports contain extensive lists for this band and from these we select the following: **A.2273** (Dudley) heard VR2DE (07.43), FF7AB (09.29), 9N1MM (13.05), FF8AP/M (17.11), 601TUF (18.27), 602GM (15.14), 9U5PD (16.16), HI8GA (22.46) and XE3CW (20.33); **B.R.S.20317** (Bromley) logged HH2ML (23.00), VP2SL (22.45), FB8CJ (15.45), UG6AW (14.00) and ZD1AW (10.10); **B.R.S.22299** (Preston): DU6RG (17.30), UA9KOG (17.25), VS1KB (17.10), 9K2AD (17.55), and CR7CK (17.25); **A.1883** (Barrow-in-Furness):ZD2BRG (16.25), 4S7GE (18.40), VS9AJW (19.05) and FQ8AE (21.06); **A.1902** (Reading): VP5RA (21.05), HP1SB (09.20), CP5EA (21.33) and HK3QA (22.06); **A.1965** (Penzance): KG4AO (20.30), KA2GI (17.45), KG1AE (18.45) and VS1KF (17.40); **A.1736** (Corby): MP4BBA (16.25), DL3RO/EP (18.45), ZD2AMS (12.05), VP8DW (19.40) and on s.s.b. VQ2AB (19.57), the latter being the only active station on A3a in Northern Rhodesia.

B.R.S.22249 (B.F.P.O.53) submits a long list including VK8NE (13.35, Northern Territory), VP2KD (00.26), YS3TM (00.20), 4S7YL (05.26), on phone, with c.w. from FE8AH (06.50), CX2BT (19.52), LX3JD (19.58), and numerous JAs; **B.R.S.18876** (Birkenhead): 9G1CW (19.45), VU2AL (17.40), EL1D (17.00) and ZE7JZ (17.20); **A.1792** (Harrow Weald): ZD2JKO (15.20), UT5BZ (17.50) and VS9MB (13.50); **F.R.S.309:** TI5RV (02.31), VK0WH (04.15), VQ4DT (07.56), HI8CM (22.36), HH2JK (13.17), TG9AS (15.15), ZP5HZ (02.45) and OA8D (01.31).

14 Mc/s

C.W.

G3AAE worked elusive ZL4JF (08.40), JA3API/MM (off Hiroshima, 19.12) and new prefix 6O2AB (20.00), with a c.w. to s.s.b. QSO with MP4MAB/4W1 (18.55). **G2FFO** (Burnley) using a ZL Special on c.w. only offers a list of rare ones worked, of which the most recent are JT1KAC (18.26), PY7LJ (20.38, Fernando de Noronha), F9UC/FC (17.45), CR7CR (18.20) and PX1PF (19.28 operated by DL7AH). Dick comments on the slowness of QSLs, a state of affairs noticed by most DX'ers these days, although there are exceptions. **G4QK** (Croydon) reports VS9MB, ET2US, FY7YG, UL7KAA and UM8AG, with a first G contact for YA2BC. **G2ZR** (Bath) weighs in with ZA1NC (22.40), 9M2GS (17.56), JT1KAA (22.17), CE2CO (22.54), OH3VJ/P (22.50, Kemmeli Is.), OX3RET (22.15, Disko Is.) and HP9FC/MM (22.20). **GM3KTZ** (Cambuslang) raised DU1OR (19.50), FY7YI (23.35), XZ2TH (18.50) and JT1KAC (21.45).

On the listening side we have reports from **A.1583** (Penryn): UJ8KAA (19.00), OH0NG (12.14), YA1BW (18.11), KR6CQ (19.25), UG6AW (18.16), UO5SW (19.20) and KG4AK (21.37); **B.R.S.22013** (Hereford): SU1AL (20.05), FY7YI (23.16), VK0WH (07.29), FO8AC (07.32), VQ1AM (20.19) and KA7DM (18.55); **B.R.S.22795** (Kingston): UA0AG (22.20), UM8KAB (22.06), ZD2AMS (22.14) and CR4AX (22.02); **A.1543** (Leiston): UN1AP (19.32), VQ4HT (19.14), and DU1OR (19.30); **B.R.S.20317** UA0LR (20.00), XZ2TH (15.30), UL7CD (14.30), FB8CJ (16.10), and JT1KAC (18.25).

S.S.B.

G8KS (Farnborough) offers AP2CR (18.10), KZ5WD (06.40, Danny Weil), MP4MAB/4W1 (18.40), W8UTQ/3V8 (19.25), KG6AIG (20.25), VS6CK (21.00) and HV1CN (19.10). **G3FPQ** contacted ET2US (18.30), KG6ICD (18.30, Marcus Is.), ST2AR (15.50), 9M2DB (16.00), LX3EQ (17.25) and ZS7P (18.30).

Commonwealth Competition

	28 Mc/s	21 Mc/s	14 Mc/s	7 Mc/s	3·5 Mc/s	Total
G3BHW	41	53	48	4	—	146
G3AAE	46	41	43	14	—	144
VE7KX	14	38	29	32	27	140
G8KP	18	32	35	26	18	129
ZD2JKO	27	39	30	22	6	124
G4CP	15	29	41	18	15	118
G5VU	20	27	38	10	9	104
G8DI	12	11	20	12	18	73
MP4BBW	—	18	54	—	—	72
GM2DBX	37	21	8	—	—	66
VO2NA	7	10	24	14	6	61
G2BLA	14	14	10	10	6	54
G3JSN	14	8	9	10	6	47
G3KHA	13	—	27	—	—	40
G3BRE	—	2	8	8	18	36
G2DCG	7	21	3	—	—	31
G3KSH	7	9	6	4	3	29
G3GMY	12	12	3	—	—	27
G3MCN	10	12	1	—	—	23
G3MGL	8	2	6	4	—	20

Band Leaders

28 Mc/s—G3AAE 21 Mc/s—G3BHW
14 Mc/s—MP4BBW 7 Mc/s—VE7KX
3·5 Mc/s—VE7KX

	28 Mc/s	21 Mc/s	14 Mc/s	7 Mc/s	3·5 Mc/s	Total
B.R.S.20317	39	61	62	48	30	240
B.R.S.15844	32	45	49	52	27	205
B.R.S.22013	26	55	65	18	6	170
A.1859	40	57	43	4	3	417
B.R.S.22249	31	53	29	18	3	134
B.R.S.21008	36	53	34	4	—	127
A.1583	25	62	28	—	3	118
B.R.S.2292	25	29	26	18	—	98
A.1792	26	46	26	—	—	98
A.1902	32	42	19	—	—	93
A.2065	26	30	29	2	3	90
A.1965	12	41	16	2	3	74
B.R.S.18876	4	55	11	—	—	70
A.1980	24	31	6	—	—	61
B.R.S.21457	—	—	51	—	—	51
A.1946	7	9	12	2	3	33

Band Leaders

28 Mc/s A.1859 21 Mc/s—A.1583
14 Mc/s—B.R.S.22013 7 Mc/s—B.R.S.15844
3·5 Mc/s—B.R.S.20317

The mythical difficulty of tuning s.s.b. has been exposed by **A.2273** who heard BV1USC (15.17), OH0NC (09.22), OY7ML (07.32), XE1XN (06.54), 9M1GW (17.45), HZ1TA (16.13), K0ROQ/KL7 (07.20), and FR7ZD (17.35, using the W6UOU Argonaut) while **A.1736** logged W3ZA/EP (20.10), TI2EH (06.45), TF2WEZ (08.25) and HV1CN (21.15). **A.2111** (Ilford) listened to 9Q5AG (17.45), KA2CB (16.00), KG1FR (18.15), VK5AV (16.05) and VQ9TED/MM (19.10). **A.1918** (Eccles) heard VS1JV (18.12), VS9AZ (18.16), 7G1A (21.08), KH6COY (07.10), YN1TAE (22.30), PX1PF (20.00) and KL7FAK (07.05) and **B.R.S.22013** CR4AX (00.06), ZS7P (17.56) and others mentioned above.

A.M.

G3FPQ worked ZL4JF on Campbell Is. (05.30) while **G3AEE** reports A3/A3a QSOs with XE1TJ (06.58) and PX1PF (07.22).

A.2291 (Brocton) heard SU1KH (22.43), EA8KD (18.38), KP4AOC (02.44) and VP1JA (02.16), while **F.R.S.309** mentions VP2DA (12.16), VP9EX (12.26), XE3AF (03.52), VP5BL (23.27), KG4AA (13.15) and CO7KK (02.28).

The Lower Frequencies

Apparently nobody works DX any longer on 3·5 or 7 Mc/s and we must therefore be content with listener reports for these bands. **B.R.S.20317** logged ZB2A (23.50), CX1AA (23.08), UL7AA (23.15), ZA2BAK (23.20), PX1PF (22.30) and ZA1KC (22.09), all on 7 Mc/s with the following on 3·5 Mc/s: UA3BS (23.20), ZP9AY (23.27), PZ1PF (22.40) and UQ2AN (23.25). **A.1792** heard PY3DB (00.10) PY4AUF (00.20) and PY2AXT (00.25). **B.R.S.22249** mentions UO5NA (17.15), UJ8TR (17.18), and VU2NA (01.15).

The Commonwealth Competition

The table grows slowly and prospective new entrants may like to know that the competition is open to all transmitting and listening members, both at home and overseas. One point can be claimed for each call area worked (heard for listeners) on 28, 21 and 14 Mc/s while two points may be claimed for 7 Mc/s and three points for 3·5 Mc/s. The list of Commonwealth call areas to be used appeared on page 226 of the November 1959 issue of the BULLETIN. Please submit your claims in accordance with the form of the monthly table. Claims more than three months old will be deleted.

* * *

The *W.G.DX.C. Bulletin*, the *DX'press* and W1WPO (of A.R.R.L.) are thanked for help with some items. Reports and news items will be gratefully received and should be sent to R.S.G.B. Headquarters to arrive by August 18.

It would help with the compilation of the band reports if all times could be given in G.M.T. *QST* carries a note that the A.R.R.L. recommends the worldwide use of G.M.T. for amateur communications.

Mobile in Wales

FROM August 13-27, 1960, G3NGK/M will be active on Top Band and possibly on 2m from Llandudno, North Wales. Contacts, local and DX, will be much appreciated.

R.S.G.B. QSL Bureau

MEMBERS who use alternative prefixes when operating away from home in other countries of the United Kingdom are asked to send envelopes to the appropriate QSL Bureau Sub-managers for the prefix concerned. This will ensure speedy delivery of cards.

SOUTH WEST OF ENGLAND OFFICIAL REGIONAL MEETING

ROYAL HOTEL, ESPLANADE, WEYMOUTH

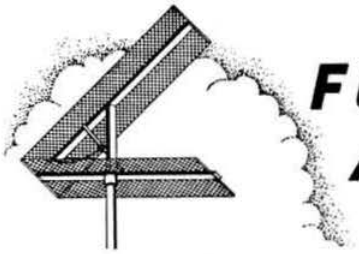
Sunday, October 2, 1960

Programme:

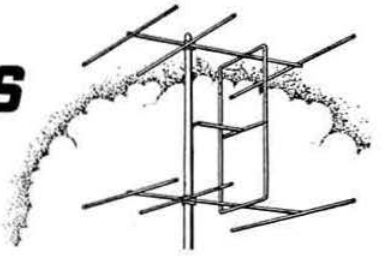
9.45 a.m. onwards	**Talk-in by G3MT on 1910 kc/s and by G3AS/M on 144·16 Mc/s.**
10.45 a.m.	**Assemble at Dorchester Radio Station**
11 a.m. ...	**Tour of Radio Station**
1 p.m. ...	**Informal Lunch at Royal Hotel (optional item, 10/6).**
2 p.m. ...	**Photograph.**
2.30 p.m.	**Business Meeting.**
4.30 p.m.	**Buffet Tea.**
5.30 p.m.	**Prize Distribution.**
6 p.m. ...	**Lecture on "Communications Receivers" by J. N. Walker (G5JU).**

A Ladies' Programme is also being arranged. Tickets, price 11/- each (children, 6/-), are available from A. A. Barrett (G5UF), 4 Radio Station Houses, Dorchester, Dorset. Last day for reservations: September 24, 1960.

Headquarters will be represented by Messrs. C. H. L. Edwards (G8TL), R. C. Hills (G3HRH), F. A. Russell (G3BHS), E. W. Yeomanson (G3IIR) and the General Secretary (John Clarricoats, O.B.E., G6CL).



FOUR METRES AND DOWN



Beacon Station GB3VHF—Meteor Scatter Reporting

By F. G. LAMBETH (G2AIW) *

MENTION has been made from time to time of the Society's plans for the setting up of an automatic beacon transmitter operating in the 144 Mc/s band. The purpose of this transmitter is twofold. Firstly it is to be used for v.h.f. propagation measurements in support of the United Kingdom programme in preparation for the Tenth Plenary meeting of the C.C.I.R. which is to be held in 1963. This work is being carried out for the U.K. Study Group 5, the body which is concerned with v.h.f./u.h.f. propagation. The second purpose of the transmitter is to provide a reliable service to v.h.f. amateurs as a frequency marker, a signal for receiver adjustments and also as an indication of propagation conditions to operators outside the immediate vicinity.

The B.B.C. has generously consented to the installation of the transmitter at its Wrotham station with the aerial array mounted on the mast at the 200 ft. level beaming north-west. This aerial array, which has been donated by J-Beam Aerials Ltd., is a five-element Yagi especially designed to withstand the severe environmental conditions that it will experience. The aerial feeder is 72 ohm low loss heavy duty cable supplied by British Insulated Callenders Cables Ltd., and is some 300 ft. long, terminating in a small hut located near the base of the mast. The transmitter, a Plessey Type PT15A rated at 50 watts output, is to be located in this hut together with a programme timer and keyer unit.

It is proposed that in the first instance the transmitter shall operate for a total of about 12 hours per day consisting of a two hour period in the morning, another two hour period at midday and the remainder in the evening. The actual schedule will be published when the station is put into operation.

After lengthy discussion the V.H.F. Committee has decided that the operating frequency shall initially be 144·50 Mc/s to conform to the British Isles Two Metre band plan whilst operating as a useful marker frequency. This frequency will be subject to review after some operating experience has been gained. The transmitter will send out a continuous unmodulated signal (this is necessary for propagation measurements) but will transmit its call-sign at intervals of not greater than ten minutes.

It is hoped to have the transmitter operating experimentally from the QTH of G2UJ at Tunbridge Wells, Kent, in the near future to test the equipment prior to final installation at Wrotham. The programme timer/keyer unit is proving to be a troublesome piece of equipment from the design point of view and so far a fully satisfactory device has not been made. A concerted effort is now being applied to this problem and it is hoped that a satisfactory unit will be available within a month or so. This indicates that the beacon is unlikely to be operating from Wrotham much before the end of this year.

The propagation measurements are to be made over a 200 mile path and a fully automatic receiver is being constructed which will be installed on an excellent site in the Midlands area. This receiver will feed a pen recorder which has been loaned by the G.P.O. from which a permanent record of the received signal strength will be obtained. In addition to these measurements, it is hoped suitably situated operators will make regular observations of field strength and fading rates to augment the propagation data that will be extracted from the automatic recordings.

Meteor Scatter Reporting

G3HBW (Bushey) who is widely known for his pioneer work on meteor scatter has sent the following notes on a reporting system based on tried European and U.S.A. methods, which has already been accepted in principle by the I.A.R.U. Region I V.H.F. Committee and the V.H.F. Managers' Conference.

Reflection from ionised meteor trails in the lower ionosphere is a propagation mechanism used by amateurs to make QSOs on the 144 Mc/s band, usually for the purpose of establishing new records for the band.

Two stations, between 500 and 1,500 miles apart in most cases, set up very accurately timed schedules to operate on c.w. for periods of from 30 seconds to five minutes each, alternately sending and listening. Schedules usually last for one to five hours and are normally arranged to take place at favourable times for working over paths in particular directions during one of the annual meteor showers.

The signals are received in bursts of varying duration and

Members of the Midland Amateur Radio Society operating G3MAR/P at Lickey Beacon during the Second 144 Mc/s Field Day on July 3, 1960. Left to right, G3BA, Colin Taylor, G3EKN, Doug. Kingston, G3HAZ and G2CIW.
(Photo by courtesy of The Holloway Studio, Birmingham)

* *V.H.F. Manager, 21 Bridge Way, Whitton, Twickenham, Middlesex.*

strength; the shortest, known as " pings," may last only for a small fraction of one second, giving part of a dot or dash; the longest, of up to several minutes, are produced by so-called " overdense " meteor trails, the result of a large meteor. As signals are received in such short bursts at long intervals, an ordinary QSO involving the exchange of reports, QTHs, " handles," " rigs," etc., could hardly ever be made in a reasonable length of time. The A.R.R.L. has therefore suggested that the minimum requirements for a QSO to be considered complete are: the exchange of (i) *both* call-signs; (ii) the report; (iii) the final " R."

This of course applies to both stations. The RST form of signal reporting is not really applicable to signals received in the form of short bursts so reports are exchanged using a two-digit system. The first digit, from one to five, refers to the duration of the first reasonable burst received whilst the second digit represents signal strength on an ordinary one to nine scale. The duration code is as follows: S1—pings; S2—bursts up to five seconds; S3—bursts from five to 15 seconds; S4—bursts from 15 seconds to two minutes; S5—bursts more than two minutes long.

For example " S26 " means a burst received of duration up to five seconds at strength 6.

Suppose that two stations, G3WXY and G3XYZ desire to attempt a QSO by means of meteor scatter. The following procedure is suggested to assist them. They arrange to call and listen for one another during alternate minutes. Firstly, G3WXY calls " G3XYZ de G3WXY " over and over again for the whole minute. G3XYZ then sends " G3WXY de G3XYZ " during his transmitting period. This continues until one station hears enough of the other to positively identify him. Suppose the first reasonable burst heard by G3WXY is an S26 one. He sends " G3XYZ de G3WXY, S26 S26 S26." G3XYZ does likewise when he has identified G3WXY. As soon as one station, say G3XYZ, has received both call-signs and the report, he begins sending only " RRR RRR " and, as soon as G3WXY has heard it, he also ceases to transmit call-signs and report. Instead, he uses one of the following signals to tell G3XYZ what information he still requires.

MS MS MS — I need my call and the report
YS YS YS — I need your call and the report
MC MC MC — I need my call only
YC YC YC — I need your call only
BC BC BC — I need both calls
SSS SSS — I need the report only
ALL ALL — I need all

Upon identifying this, G3XYZ no longer sends " RRR RRR " but attempts instead to supply the information which G3WXY requires. As soon as G3WXY has copied everything he starts to send " RRR RRR " himself. Finally upon hearing this, G3XYZ *ceases transmitting* and the QSO is complete. G3WXY should continue to operate for at least half-an-hour to satisfy himself that the signals from G3XYZ have really ceased.

Auroral Opening

GM2FHH reports that another auroral opening, a very good one, occurred on July 15 (22.30-22.59) and 16 (00.00-01.15). GM2FHH worked GW2HIY, DL1PS GI5AJ, G3CCH and G3ILD while SM6QP, SM6APB/6, DL9ARA, DL1RX and many weak phone stations were heard. Overall there appeared to be comparatively few stations on but the SMs were heard busy working each other. GM2FHH first noticed the opening at 22.30 G.M.T. on the 15th, although GW2HIY said he had been on for about two hours! At 01.15 G.M.T. when GM2FHH retired, G3ILD was still 59A. The " corona " and " lance " effects of the aurora were easily seen through the bright northern sky, which is rather unusual. It must have been an intense opening. G3ILD tried s.s.b., but it was quite impossible to copy due to the very rough character of the auroral scatter. Normal propagation was poor and the only signal copied on direct bearing was GI5AJ at 449. The barometer was at about 1000 mb. Apart from the above, conditions in the Aberdeen area have been shocking lately. A newcomer to 2m in Aberdeen is GM3NOV (running a few watts to a four element Yagi). GM3FKS has been out with portable gear and hopes to go portable " when summer comes! "

Major Radio Meteor Showers

Duration	Shower	Radiant Rise	Radiant Set	Radio Rate	Veloc. Km/s
Jan. 3-4	Quadrantids	23.00	18.00	40	39
April 21-22	Lyrids	21.00A	11.00A	10	51
May 4-6	Eta Aquarids	03.00	12.00	12	66
May 19-21	Cetids	05.30	14.30	20	20
June 4-6	Zeta Perseids	05.00A	18.00A	40	29
June 7-8	Arietids	03.00A	16.00A	60	40
June 25	Perseids	03.00A	18.00A	50	—
July 1-2	Beta Taurids	05.00	17.00	25	31
July 12	Alpha Orionids	05.00A	15.00A	50	—
July 12	Epsilon Geminids	05.00A	17.00A	60	—
July 12	Lambda Geminids	06.00A	18.00A	32	—
July 25	Aurigids	02.00A	17.00A	20	—
July 27-29	Aquarids	22.00	06.00	20	50
Aug. 10-15	Perseids	circumpolar		50	61
Oct. 9	Giacobinids	06.00	03.00	var.	20
Oct. 20-23	Orionids	22.30	09.30	15/30	66
Nov. 15-17	Leonids	00.00A	12.30A	10/40	72
Dec. 11.14	Geminids	19.00A	09.00A	50/70	35

Rates are given per hour. Times of rise and set are local times.
" A " indicates approximate time only. " var." means variable.

G4LX says there were no other major auroral openings during the month and only one indication of this mode of propagation was gleaned from reports in England. On June 21, G3JGJ was in QSO with G3FYR and found that his note was very rough when the beam direction was to the north-east. This almost certainly seems to be an auroral reflection. In Sweden, SM6PU found traces of aurora on June 21 too. On June 29, a slight opening in Sweden brought about a few QSOs, otherwise the month only showed traces of aurora on seven days but without satisfactory contacts.

The opening on July 15 was much livelier and G4LX found that the aurora was in full swing at 16.00 G.M.T. On the 50-60 Mc/s band the European TV stations were being received at S9+A. Apparently the G boys did not notice this one and only GW2HIY was logged. Reports would be appreciated of any other activity during this opening.

Two Metre Happenings

With recent weather conditions, it is small wonder that there is comparatively little to report and the summer's long awaited tropospheric openings have yet to materialize. However, the activity is there as is amply proved by A.1491's report this month, demonstrating that if you are looking for them, stations can be heard and presumably worked, even in what are apparently the worst possible conditions.

G3JGJ (Moretonhampstead) has found things generally quiet and says that the only London district stations worked *this year* are G3LTF, G3KEQ and G3AYC with G3HBW heard—this the result of evening operation seven days a week! During July, GC2FZC was worked as was G5ZT (Plymouth) who has done very well so far and hopes to go /P quite a lot. G3JGJ's steel tower is not up yet but the five element Yagi for 2m and a 6-over-6 slot for 70 cm are on top of a 50 ft. mast which now clears the trees in many directions. Other stations worked during July have been G6NF/P (Haytor Rocks, Devon, over 1,000 ft. a.s.l.), G6GN, GW8SU, G4GR, and G5DW with G2JM heard. G3JGJ is on 2m every evening from 18.40 clock time beaming n.n.e. calling CQ for five minutes and listening for signals from the north. So far only G5BM has been heard. The

sked with GC2FZC is around 19.00 and a number of S9+ QSOs have taken place.

G5ZT (Plymouth) says that although Plymouth is reckoned a bad spot for 2m it seems obvious that the real cause is " no beams my way " bearing in mind what he worked in the Second 144 Mc/s Field Day. The QSOs included G3KHA (Bristol), GW8SU (Porthcawl), G3MDH/P (nr. Shaftesbury), G3IUD/M (Tintagel), GD3JZN/P (Douglas, I.o.M.—the *pièce de résistance!*) and F9UW who called but was lost. Quite a good effort!

A.1491 (Palmers Green, N.13) says conditions were good during parts of June but July was very poor like its weather. The two best periods were May 29/June 5 and June 19/22. The optimum direction on both occasions was s.w./n.e. path. Outstanding stations in those directions were G2IJ, G3GVC and G5TZ to the s.w., and G2HOP and G3CCH to the n.e. The latter path was most useful as G3HUL and G3IOR are now operating from Norfolk. G3AC was also on from Suffolk with a very good signal. Due west, G3EHY and G6GN were the only signals heard (and they were weak) but the Midlands seem to have faded right out of the picture except for one appearance by G3LHA. In the north G3MNQ has increased power and changed frequency to 145·62 Mc/s. His signals are now as consistent as those of G5YV and are often comparable in strength. The sked was maintained without difficulty during the recent unsettled weather. Some good signals have been heard from the north during poor conditions, which seems to prove that if the activity is there the work can be done! The Field Day began well but faded out and conditions did not improve, even in the evening. The best heard were G3ERD/P, G8SB/P, G3NNG/P, G2HIF/P and F3LP.

New stations heard include G3AFY (S. Tottenham), G3AOK (Cheam), G3BSU (Strood), G3BCP (Bromley), G3KPB (Wandsworth), G8DF (Ewell), G3FMP (Basildon), G2FPP (Cranford), G3MLE (London W.1), G5SD (Sevenoaks) and G2DHV/M. Others seem to be coming on to 144 Mc/s almost daily.

G3LTF (Danbury, Essex) found one or two bright spots in what looks like a season of poor tropo. On June 16 GM3EGW was worked (tropo) with deep fading and on the 17th the first Cornwall station, G3FYR, at varying strengths. On the 18th GM3EGW was again worked. On the 21st PA0s were heard at medium strength. DL6WUA (S2/9) was working Bristol stations at S5/9 both ways. On June 22 PA, ON and nearer DLs were coming across. On June 25 GM3EGW copied G3LTF's phone but stayed on c.w. because of high ignition noise at Danbury. Later that night G2FO (569) and GM3HLH/A (579/589) were also raised. On the 26th the band suddenly seemed to open up at 22.00 and DL6QS was heard working PA0ON and was worked by G3LTF (589/579) at 22.08. At 22.23 DL9WO (Hamburg) was also contacted.

On July 1 a fine c.w. QSO was made with G3ILD who was on s.s.b. On July 2 PA0s were about but not very strong. The best, PA0EZ (Nijmegen), suffered from deep QSB. This made a poor augury for Field Day and although a new site was tried the general opinion was that it was no good. No real DX was heard. Congratulations to G3LTF and his wife on the daughter who arrived 3½ hours after the last Field Day QSO! All skeds temporarily suspended!

Whilst on holiday in Holland recently **G5OX** and **G2UJ** called on PA0FB (The Hague), PA0LQ (Leiden), PA0BU (S'Hertogenbosch) and PA0GH (Gouda). Although conditions were poor at the time of the visit, they heard G3KEQ being worked from PA0LQ during the regular sked and it was interesting to hear how G signals sound on the other side of the North Sea. PA0BU has temporarily forsaken 2m for 40 and 80m but says that he will put in an appearance on the band again soon. TVI seems to be something of a problem for the majority of PAs operating on 2m and the bulk of activity seemed to be confined to the late evening.

G2AHL (Guildford) reports there is a great deal of 2m working taking place in Hampshire and neighbouring southern counties. Among the stations noted is a newcomer to the band, **G2SG** (Alton), who is looking for contacts most evenings. G5NF (Farnham), the sporadic *E* Gold Medalist, is well known as also are G3MPS (Aldershot), G6OU (Basingstoke), G4PS (Crookham), G3ION (Southampton), G3GVC (near Portsmouth), and G3LOK (Cowes, I.o.W.). G3KND (Farnham) and G3IQE (Newbury, Berks.) also put out good signals. With so much activity locally, it is strange that so little in the way of reports comes from that area. What about it?

Four Metre Activities

A.1491, using a modified r.f. unit and a dipole in the shack has heard only three stations, all during the 70 Mc/s Contest (G3AIH, G3AYC and G3IUL). By various means information has been gathered south of " G5YV's domain " and here follows the result, listing the active stations: G2AIH, G2AOK, G2DD, G2JF, G3AYC, G3CLW, G3DOR, G3EHY, G3FEX, G3FQS, G3GDR, G3GSO, G3GZM, G3IUJ, G3IUL, G3KAG, G3LTF, G4IF, G4MK, G5MR, G6NB and GW3MFY.

G5YV says that activity in the north has been very low recently after being good for some weeks. The openings have been there but no amateur signals have been heard from the South. Perhaps those listed above will turn their aerials towards the north and redress the balance!

General Notes

G5YV and **G3JWQ** will be operating portable on 144 Mc/s and 432 Mc/s from many counties in North Wales during the week commencing August 15. Operating times will normally be between 20.00 and 23.00 clock time.

G5UM reports that about a dozen members of the Welwyn Garden City group are now equipped for net operation on 145·8 Mc/s—a frequency chosen many years ago to keep the Mid Herts net clear of the mid-band congestion in the London area. The net operates from 8 p.m. clock time every Monday and continues for 30 to 40 minutes afterwards. Members then go their separate ways on local zone frequencies. Occasionally, operators from farther afield net in on the Mid Herts activity—they are always welcome. The necessary crystals on 8100 kc/s are obtainable from the usual surplus suppliers.

G3ABZ (Maidstone) has given more news regarding his single valve converter which is still going strong (70 stations heard including F and ON on a 10m folded dipole). A transmitter is now complete (Kalitron v.f.o., EF50 buffers, TT11 doubler and TT11 (VT501A) in p.p.) is now completed except for the p.a. G3ABZ asks that 144 Mc/s operators state their frequencies; it would help newcomers to the band.

LONDON U.H.F. GROUP
will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,
at 7.30 p.m. on Thursday, September 1, 1960
All v.h.f. and u.h.f. enthusiasts welcome.

V.H.F. QSY

Members who wish to acquire or dispose of crystals in connection with the British Isles Two Metre Zone plan announced in March 1959 are invited to send details to " V.H.F. QSY," R.S.G.B. *Bulletin.*

Crystals Offered
By GC3ODE, Greenlands, Rohais, St. Peter Port, Guernsey, C.I. 3872·5 kc/s (¾ in. pin spacing).

Crystals Required
By GC3ODE, as above. Any crystal suitable for Zone 2 operation.

Society News

Unlicensed Operation

THE Society has been informed by the Radio Services Department of the G.P.O. that the Engineering Department is being constantly hampered in its investigations into unlicensed transmissions by amateurs who challenge and sometimes even deliberately jam the " pirate " stations involved. On several occasions recently action of this kind has taken place just as the inquiry officers were about to obtain d.f. bearings on the suspect stations. This not only prevented the location of the stations but necessitated the continuation of lengthy and expensive monitoring pending further operation by the " pirates " thus causing a delay which is apt to be attributed to inertia in the Post Office.

Members are requested to refrain from any action which could embarrass Post Office inquiries into unlicensed transmissions particularly by giving a " pirate " reason to believe that he is under suspicion; by contacting him and by interfering in any way with such transmissions.

On two occasions recently the efforts of the G.P.O. to obtain d.f. bearings on a suspect station in Hertfordshire were ruined by action of the kind referred to above.

Pirates Fined

AT Lincoln Juvenile Court on July 18, 1960, two Lincoln boys were fined £3 each after admitting they had used transmitters at their homes without being licensed. According to the *Lincolnshire Echo*, the chairman of the magistrates said, " This is a serious matter which should not have occurred. We have considered very seriously the possible confiscation of your equipment."

* * *

At the Sheriff's Court, Glasgow, on July 12, 1960, E. Davies, 182 Calder Street, Glasgow, S.2, pleaded guilty to using radio transmitting apparatus without a licence, for which offence he was fined £6.

British Commonwealth Receiving Stations

AS from August 15, 1960, the term British Empire Receiving Station (B.E.R.S.) will be replaced by the term British Commonwealth Receiving Station (B.C.R.S.).

Members who were issued with a B.E.R.S. number may continue to use that number on correspondence and QSL cards or they may substitute the letters B.E.R.S. for B.C.R.S.

The annual Commonwealth contest organised by the R.S.G.B. will continue to be described as the B.E.R.U. Contest, whilst the British Empire Radio Transmitting Award (B.E.R.T.A.), the Worked the British Empire Certificate (W.B.E.) and the Heard the British Empire Certificate (H.B.E.) will all continue to be described as such.

R.S.G.B. Tape Recorded Lectures

MR. N. C. Ta'Bois (G3HWG) has been appointed Honorary Curator of the R.S.G.B. Library of Tape Recorded Lectures in succession to Mr. F. W. Lawrence (G2LW) who has been compelled to relinquish that office due to pressure of private business.

All correspondence in connection with the Tape Recorded Lecture Library should be addressed to Mr. Ta'Bois at 81 Snakes Lane, Woodford Green, Essex, and not to his private address.

Affiliated Societies' List

IT is proposed to publish a list of societies affiliated to the R.S.G.B. in the September issue of the BULLETIN. In order to ensure the accuracy of the list, Honorary Secretaries recently appointed or who have changed their addresses are asked to inform Headquarters by not later than August 22.

Frequency Advisory Committee

THE Postmaster General has announced that Dr. R. L. Smith-Rose, C.B.E., will succeed Sir Lawrence Bragg, O.B.E., M.C., F.R.S., as Chairman of the Frequency Advisory Committee when the latter retires at the end of next month.

Dr. Smith-Rose who has been a member of the F.A.C. since its inception two and half years ago is currently Director of Radio Research, D.S.I.R., and the Immediate Past President of the R.S.G.B.

The R.S.G.B. is represented on the F.A.C. by the General Secretary (Mr. John Clarricoats, O.B.E., G6CL). Other members of the Committee with a personal interest in Amateur Radio include Major-General Eric S. Cole, C.B., C.B.E. (ex-G2EC), Lt.-Col. H. O. Pargeter (G6MA), Mr. H. E. F. Taylor (G6HT), Mr. C. G. Phillips, O.B.E. (G5PJ), Superintendent F. Gee, B.E.M. (G6OG).

R.S.G.B. QSL Bureau—New G8 Sub-Manager

OWING to pressure of work, Mr. A. W. Gover (G4AU) has had to relinquish responsibility for the G8 section of the Society's QSL Bureau. The new Sub-manager is Mr. A. J. Mathews (G6QM), 62 Ashlands Road, Hesters Way Estate, Cheltenham, who also deals with calls in the G6 series.

Woburn Abbey Mobile Rally

ALTHOUGH the Society is not arranging a mobile rally at Woburn Abbey this year. it is planned to hold a large-scale National Mobile Rally there during 1961. As soon as a date has been agreed with the Woburn Abbey authorities a further announcement will be made.

Headquarters Lift

IT is regretted that there will be no lift service at New Ruskin House for another two to three weeks while a new lift is being installed. Members are reminded that the Society's offices are on the fifth floor of the building.

Air Marshal Sir Raymund George Hart, K.B.E., C.B., M.C.

THE tragic death on July 16, 1960 of Air Marshal Sir Raymund Hart has deprived the radio industry of an outstanding personality.

Raymund Hart was a pioneer of radar having joined the Watson Watt team at Bawdsey in 1936. He helped to develop the operational use of radar for night fighters. Sir Raymund retired from the R.A.F. in January 1959, having been Controller of Engineering and Equipment at the Air Ministry since 1956. He was created a K.B.E. in 1957.

Raymund Hart served with No. 15 Squadron during the first World War and was awarded the M.C. When he retired he was the last R.F.C. pilot on the R.A.F. active list. Since then he had been Director of the Radio Industry Council.

Sir Raymund was the Guest of Honour at the Reunion of the Radio Amateur Old Timers' Association in April last and although he had at no time been a practising radio amateur he fully appreciated the debt which the three Services owe to the Amateur Radio movement. Sir Raymund was Patron of the R.A.F. Amateur Radio Society, a Vice-President of the Radar and Electronics Association and President of the British Wireless Dinner Club. He opened the R.S.G.B. Radio Hobbies Exhibition in 1958.

Sir Raymund was electrocuted in his garden at Aston Rowant, Oxfordshire, whilst making an adjustment to his lawn mower.

The sympathies of all members are extended to Lady Hart and her family in their great loss.

R.A.E.N. Notes and News

By E. ARNOLD MATTHEWS (G3FZW)*

RECENT correspondence in the BULLETIN indicates a lack of interest in traffic handling in this country. This is hardly surprising since conditions here (ignoring any question of Government monopoly) are not so favourable to the establishment of an open general traffic system but it is possible for those interested to find some satisfaction in R.A.E.N.

The evidence available suggests that there is as great a demand for R.A.E.N. medium distance communications as for local contacts. This means the setting up of " routes " as opposed to " nets " and involves operators working with unfamiliar colleagues. Familiarity with procedure is essential if delay is to be avoided. Unless regular practice is carried out groups will not work up to a realisable speed in handling written messages. Time will be lost if messages are sent too fast or too slowly. There is a world of difference between taking the general sense of what the other man is sending and getting his message down on paper word perfect. One of the pitfalls which most easily traps the unwary operator is the belief that he can handle messages efficiently because he is an efficient operator in normal contacts. Fast message handling requires practised operators.

Around the Groups

Two more counties have established firm contact with their police forces and have initial demonstrations arranged. **East Suffolk** group have installed a station at County Police H.Q. and tested it on July 24 in preparation for an exercise arranged by the police for August 8.

Surrey group controller, G3VK, has recently attended meetings with his Chief Constable, at the second of which the County Civil Defence Officer and a Home Office Wireless Technical Adviser were present. Plans are afoot to instal equipment in County Police H.Q.; an initial exercise was to link three points in the county with this station. The group strength has become settled and G3VK has a very useful " hard-core " on whom to rely. He plans to contact various societies in the south and west of the county in the near future.

A recent report from G3GXZ, C.C., **Leicester and Rutland,** covers several months' activity, the high-light of which was an exercise held in June. This was carried out in two parts—a test call-out on June 20 and a railway crash clearance at Glanfield on June 26. A total of 14 relief services participated in this exercise, the action of which carried out to a time scale accelerated six times that normally expected in such disasters. R.A.E.N. stations were used to provide links between the disaster and police and B.R.C.S. H.Q.s, and also local communications by means of walkie-talkies. Information transmitted included nominal rolls of " casualties " totalling over 70 names and addresses sent in 90 minutes. Leicester Red Cross are moving to a new H.Q. later this year and it is hoped make good use of much improved facilities for R.A.E.N. purposes. It seems that the installation work involved, and another full-scale exercise, will keep this keen group fully occupied during the next six months.

An exercise held on July 1 by **North Norfolk** group to check communications with North Walsham police station ran into trouble owing to poor aerials at the control and one link station. As a result the group is constructing two 30 ft. loaded vertical transportable aerials which, it is hoped, will overcome the difficulty.

Somerset group held a county-wide exercise on July 3 when a " disaster location " near Yeovil was linked with a R.A.E.N. H.Q. at Weston-super-Mare by two sets of stations formed from mobiles placed at 15-25 mile intervals. Several user services were present at this demonstration.

Owing to business requirements the **Staffordshire** C.C., G3DML, is frequently away from home and has appointed G2AMN as his deputy.

R.A.E.N. Rally 1960

Members wishing to enter this contest on October 2 are asked to apply for test phrases and log sheets in good time in order to avoid any last minute rush. The rules, the same as for 1959, will be published next month.

Piano Fortissimo

MR. K. T. HARVEY (G5KT), 116 Brynland Avenue, Horfield, Bristol 7, will be pleased to hear from any member who has made a tape recording of Piano Fortissimo by Renato Carosone and his sextet from French or Franco-Swiss broadcasting stations or has the Pathé record (G.1231) of this item which is no longer available.

Willard D. Cook (W1JFG) to visit London

MEMBERS who have worked W1JFG of Hopedale, Massachusetts, will be interested to learn that he and his wife are visiting London this month. Anyone who would like to meet him may do so during the evening of August 20 at Berners Hotel, Jermyn Street, Piccadilly Circus.

GB3SRA at Summer Shows

SOUTHGATE, Finchley and District R.S.G.B. Group will be operating GB3SRA on all bands from 10 to 160m at two shows during the next few weeks.

On August 19 and 20, GB3SRA will be at the Friern Barnet Summer Show in Friary Park, London, N.20. September 9 and 10 will see the station in action at the Wood Green Show, Woodside Park, High Road, London, N.22.

Operation will continue throughout the Friday night in both cases and all QSOs will be confirmed by a distinctive QSL card.

GB2RS SCHEDULE

R.S.G.B. News Bulletins are transmitted on Sundays in accordance with the following schedule:

Frequency	Time	Location of Station
3600 kc/s	9.30 a.m.	South East England
	10 a.m.	Severn Area
	10.30 a.m.	North Midlands
	11 a.m.	North East England
	11.30 a.m.	South West Scotland
145·55 Mc/s	11.15 a.m.	Beaming south-east from Leeds
	11.30 a.m.	Beaming south-west from Leeds
	11.45 a.m.	Beaming north from Leeds
145·3—145·4 Mc/s	12 noon	Beaming north from South East England
	12.15 p.m.	Beaming west from South East England

News items for inclusion in the bulletins should reach Headquarters not later than first post on the Thursday preceding transmission.

* *1 Shorthutts Lane, Lichfield, Staffs.*

CONTEST NEWS

RESULTS — REPORTS — RULES

420 Mc/s Contest 1960

NEARLY 50 stations are known to have been active during the 420 Mc/s Contest on May 22, 1960, all in the southern half of England. No reports were received of any stations further north than Derbyshire and Shropshire. Conditions were so poor that no one was able to work many more than half of those on the band at the time.

G. A. Jeapes (G2XV) once again won comfortably though there are signs that the competition is getting keen. He used much the same gear as in 1959 with 95 watts to a QQV06-40 p.a. and a 40 element stack. The receiving equipment comprised a crystal controlled converter with a grounded grid r.f. stage and crystal mixer feeding into an SX28 main receiver. A. L. Mynett (G3HBW) was second running 150 watts input and a 72 element array. The converter incorporated an A.2521 r.f. amplifier and fed into an HRO main receiver. Only eight contacts over 100 miles were reported, the longest being between G2CIW and G3LTF at 120 miles.

Results—420 Mc/s Contest 1960

Position	Call-sign	Contacts	Points
1	G2XV	23	1284
2	G3HBW	27	1145
3	G3HAZ/P	25	1054
4	G2CIW	23	1015
*	G3LTF	19	850
6	G2HDJ	20	828
7	G3LHA	14	700
8	G3JWQ	12	695
9	G5UM	14	371
10	G2FCA	19	362

*Late entry.

National 144 Mc/s Open Contest 1960
National 420 Mc/s Open Contest 1960

THESE contests have been arranged to take place during the period of the European V.H.F. Contest on September 3-4, with a view to encouraging activity in the British Isles at that time. The general rules for Region I V.H.F. Contests published in the July 1959 issue of the R.S.G.B. BULLETIN will apply. Members who wish to enter the European V.H.F. Contest should submit *duplicate* entries with cover sheets made out in accordance with the sample entry shown below. Attention is drawn to the two Fixed Station sections—high and low power—in each event.

The details of the National Open Contests are as follows:

Duration. The contests will commence at 17.00 G.M.T. on Saturday, September 3, and end at 17.00 G.M.T. on Sunday, September 4, 1960.

Eligible Entrants. All fully paid-up members of the R.S.G.B. resident in the British Isles (G, GC, GD, GI, GM and GW). Multiple operator entries will be accepted provided only one call-sign is used.

Sections. Each contest will comprise three sections:
(*a*) Fixed. High Power (up to 150 watts to the p.a. stage).
(*b*) Fixed. Low Power (up to 30 watts to the p.a. stage).
(*c*) Portable/mobile stations.

Contacts may be made on A1, A3, A3a or F3 subject to the conditions of the Amateur (Sound) Licence.

Scoring. Points will be scored on the basis of one point per kilometre.

Contest Exchanges. RST (RS) reports followed by the band identification letter (A for the 144 Mc/s Contest and B for the 420 Mc/s Contest) and the contact number and location (e.g., RST559A001 5NE Bridgnorth).

Logs (*a*) Must be tabulated in columns headed (in this order): "Date/Time (G.M.T.)" "Call-sign of Station Worked," "My report on His Signals and Serial Number Sent," "His Report on My Signals and Serial Number Received," "Location of Station Contacted as Received," "Type of Emission," "Points Claimed."

Entries must be post-marked not later than Sunday, September 18, 1960.

Awards. At the discretion of the Council, the **European V.H.F. Trophy** will be awarded to the overall winner of the National 144 Mc/s Open Contest and certificates of merit to the winners and runners-up in both sections. Certificates of merit will also be awarded to the runner-up and winner in each section of the National 420 Mc/s Open Contest and to the non-transmitting member submitting the best check log in the opinion of the Contests Committee in each Contest.

SAMPLE CONTEST LOG SHEET

Contest..... Date..... Claimed Score.....

Section..... Call-sign.....

Name .....

Home address.....

Location of station..... Latitude..... Longitude.....

Height above sea level in metres .....

Transmitter..... Input power.....watts

Operating frequencies..... Crystal or v.f.o.?.....

Receiver..... Aerials.....

Date/ Time G.M.T.	Call-sign of Station Worked	Report and Serial Number		Location of Station Contacted as Received	Emission	Distance km.	Points Claimed
		Sent	Recd.				

Declaration: I declare that this station was operated strictly in accordance with the rules and spirit of the contest and I agree that the ruling of the organizing society shall be final in all cases of dispute.

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

Low Power Field Day, 1960

THE rules governing this contest are as follows:

Duration: 10.00 G.M.T. to 17.00 G.M.T. on September 25, 1960.
Eligible Entrants: All fully paid-up Corporate members of the R.S.G.B. resident in G, GC, GD, GI, GM and GW. Multiple-operator entries will be accepted provided only one call-sign is used. (See General Rule 7.)
Contacts: May be made on c.w. (A1) only in the 1·8, 3·5 and 7 Mc/s bands. Each transmission must include the letters LFD.
Scoring: *Five* points may be claimed for each contact with a portable or mobile station, and *one* point for each contact with a fixed station.
Contest Exchanges: RST reports followed by the contact number starting at 001 and the location, e.g., RST559001 Oxford.
Logs: (*a*) Must be tabulated in columns headed (in this order): "Time (G.M.T.)," "Call-sign of Station Contacted," "My Report on His Signals and Serial Number Sent," "His Report on My Signals and Serial Number Received," "Location of Station Contacted as Received," "Band (Mc/s)," "Points Claimed."
(*b*) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and must include the weight of the equipment used. The declaration must be signed.
(*c*) Entries must be postmarked not later than **October 10, 1960.**
Equipment: The total weight of all the radio and electrical equipment taken to the site must not exceed 20 lb.
Awards: At the discretion of the Council, the **Houston Fergus Trophy** will be awarded to the winning station and **certificates of merit** to the runner-up and to the non-transmitting member submitting the best check log in the opinion of the Contests Committee.
The General Rules for R.S.G.B. Contests apply to this contest. Printed log forms and cover sheets are available from Headquarters on request.

R.S.G.B. Contest Forms

SPECIALLY printed log forms and cover sheets for the use of members taking part in Society contests are available from Headquarters on receipt of a large s.a.e.

B.E.R.U. Contests 1960

THE leading stations in the B.E.R.U. Contests 1960 were (subject to re-scrutiny): *High Power Section*—ZC4IP, VE2WW and VE3UOT; the leading G was G5RI placed sixth; *Low Power Section*—ZS6R, G2DU and GW3JI; *Receiving Section*—E. H. Sherlock (B.R.S.6604), J. A. St. Leger and G. P. Watts (B.R.S.3129).

A full report will be published in the September issue of the BULLETIN.

Wessex D/F Qualifying Event

ALTHOUGH the weather was very unsettled, 11 teams arrived at Redenham, Wilts., on July 10, 1960, to take part in the first Wessex D/F Qualifying event organized by H. J. Fenn (B.R.S.2515).

The signal was good at the start and promptly at 14.05 the teams moved off to find G3LLK/P hidden in woodland at the end of a disused roadway near Littledown, 9·8 miles from the start by the shortest possible road route. The Oxford and District Radio Society took the leading three places: first to arrive, during the third transmission and after only 38 minutes, was E. L. Mollart (B.R.S.10977), followed at 15.00 by E. S. Armstrong and at 15.01 by M. P. Hawkins.

At the conclusion of a most enjoyable event, a party of about 40 had an excellent high tea at Froxfield Parish Hall.

The Contests Committee was represented by D. A. Findlay D.F.C. (G3BZG), A. W. W. Timme (G3CWW) and J. A. Rouse (G2AHL).

D/F National Final

DETAILS of the D/F National Final to be held on September 4, 1960, are being sent by post to all those who have qualified to take part.

CONTESTS DIARY

1960

August 27-28 — All Asia DX Contest (See page 556, June, 1960)

September 3-4 - European V.H.F. Contest
September 3-4 - National 144 and 420 Mc/s Contests *
September 4 - D/F National Final
September 17-18 - Scandinavian Activity Contest (C.W. Section)
September 24-25 - Scandinavian Activity Contest (Phone Section)
September 25 - Low Power Field Day
October 2 - R.A.E.N. Rally
November 6 - Second 1·8 Mc/s Contest
December 3-4 - R.S.G.B. Telephony Contest
R.S.G.B. Telephony Receiving Contest

1961

January 29 - 144 Mc/s C.W. Contest
February 4-5 - Affiliated Societies' Contest
February 25-26 - First 1·8 Mc/s Contest
March 4-5 - 144 Mc/s Open Contest *
March 11-12 - B.E.R.U. Contests
April 8-9 - Low Power Contest
April 16 - D/F Qualifying Event
April 23 - 420 Mc/s Contest
April 30 - D/F Qualifying Event
May 7 - First 144 Mc/s Field Day *
May 28 - D/F Qualifying Event
June 3-4 - National Field Day
June 10-11 - 1250 Mc/s Tests
June 17-18 - 70 Mc/s Contest
June 25 - D/F Qualifying Event
July 2 - Second 144 Mc/s Field Day *
July 9 - D/F Qualifying Event
September 2-3 - I.A.R.U. Region 1 V.H.F. Contest
September 2-3 - National 144 and 420 Mc/s Contests *
September 10 - D/F National Final
September 17 - Low Power Field Day
October 8 - R.A.E.N. Rally
November 11-12 - Second 1·8 Mc/s Contest
December 2-3 - R.S.G.B. 21/28 Mc/s Telephony Contest
R.S.G.B. 21/28 Mc/s Telephony Receiving Contest

** To coincide with I.A.R.U. Region 1 v.h.f. contests dates.*

NATIONAL FIELD DAY 1960

Leading Entrants

1.	Stamford and District Group	2239
2.	Stourbridge and District Amateur Radio Society	2192
3.	Gravesend Radio Society	1855
4.	Cannock Chase Amateur Radio Society	1839
5.	Port Talbot Radio Club	1796
6.	Wirral Group	1702
7.	Weston-super-Mare Group	1651
8.	Norwich and District Radio Club	1543
9.	Oxford and District Amateur Radio Society	1484
10.	Norwood and South London Group	1471
11.	Mitcham Group	1455
12.	Edgware and Hendon Group	1433
13.	City and County of Bristol Group	1416
14.	Reigate Amateur Transmitting Society	1367
15.	Croydon Group	1341

All subject to re-scrutiny

Region 1 Field Day

THE annual Region 1 Field Day will take place on September 11, between 09.00 and 17.00 G.M.T., when portable stations in Region 1 will be looking for contacts with portable stations in other parts of the country.

Members in Region 1 who wish to participate may obtain a copy of the rules from the Regional Representative, Basil O'Brien (G2AMV), 1 Waterpark Road, Prenton, Birkenhead.

Amateur Radio at the Manchester Electronics Exhibition

DURING the Electronics Exhibition in Manchester from July 7–13, 1960, members of the North-west V.H.F. Group operated GB3UHF on 144 Mc/s. Although conditions were poor, nearly 190 contacts were made with fixed, portable and mobile stations, the most southerly being with G2DTO/P. Most signals were extremely strong, thanks to the four-over-four array at 150 ft. Special QSL cards are being sent to all stations worked.

London Members' Luncheon Club

THERE was an attendance of 54, including 19 overseas visitors, at the gathering of the London Members' Luncheon Club on July 16, 1960. Among those who spoke after the luncheon were old timer Bob Cunningham, VK3ML, G. Jamieson, GM3HTL (Hon. Secretary, Aberdeen Members' Luncheon Club, Aberdeen T.R.), Jean-Pierre Catala, F2BO (Hon. Secretary, Paris Radio Amateurs' Dinner Club), Aaron D. Solomon, VE1OC (Assistant S.C.M., Maritime Division, A.R.R.L.) and Greer Craig, K5VQN—the latter a young man of 16.

The Chair was taken by Stanley Vanstone, G2AYC, who had the support of Arthur Milne, G2MI, John Clarricoats, G6CL, Bill Corsham, G2UV, and a number of other old timers.

The Hon. Secretary of the Club is Frank Fletcher, G2FUX, who will be pleased to hear from those who plan to be in London at the time of future L.M.L.C. gatherings. The Club is due to meet next on September 16, 1960. Reservations should be made to RUIslip 2763 or HOL. 7373 at least 24 hours before the luncheon.

Letters to the Editor . . .

Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents

Support for Code Proficiency Runs

DEAR SIR,—I must congratulate G3MRL, firstly on his CP35 and also on his suggestion that the R.S.G.B. should transmit code proficiency runs and issue certificates for correct copy at different speeds, on lines similar to the A.R.R.L. We urgently need a " shot in the arm " in this respect if some of the newly licensed amateurs are to be introduced to the delights and the fine art of Amateur Radio. The pleasure gained from an efficiently conducted c.w. QSO has, unfortunately, been denied to many, since the tragic abolition of the c.w. probationary period, during which time the newly licensed amateur, including myself, gained sufficient experience to appreciate the advantages of A1. Any scheme, such as the one now suggested, which would introduce a spirit of competitive pride in operating ability is worthy of serious consideration.

In spite of recent comments by G3MAZ, c.w. is neither outmoded nor slow, but is still the most efficient method of communication we have available, both in watts per £1 and readability in adverse conditions, including s.s.b. It does, however, require a little more ability than the throwing of a couple of switches, as in A3, s.s.b. etc.

North Wingfield, Chesterfield, Derbys. — Yours faithfully, B. BOWYER (G3GCD).

DEAR SIR,—If G3MRL's letter in the April issue on Code Proficiency Runs is a proposal; then I would like to second it. I don't particularly want a certificate to prove that I can read code at a certain speed; that could be proved on the air; but I do agree with Mr. Poole, that given some incentive, we might find better c.w. on the air.

I don't propose to enter into a lengthy discussion on the merits or otherwise of s.s.b.-a.m. I am inclined to agree with Mr. Bell. In fact I would go one further and say that the bands are not quite so bad if one can tune a signal correctly and there are those among us who haven't the vaguest idea of how to tune into any sort of signal.

Let me hasten to assure Mr. Bell, however, that c.w., as a means of communication, is far from being out-dated or slow, unless he refers to the " average " amateur also. I would like to see Mr. Bell handle the large volumes of traffic on s.s.b. that I have handled on c.w. in the past.

C.w. is now, and will for a long time, remain the most reliable form of communication under adverse conditions.

I would respectfully suggest that he start copying W1AW (or GB3RS?) code proficiency runs. Who knows, he may need c.w. sometime.

Yours faithfully,
Darlington, Co. Durham. — E. H. ROSS. (G3LWS, ex-VP8CZ, ZC4FB).

DEAR SIR,—Having seen the letter in the April BULLETIN from G3MRL I should like to support his suggestion that the R.S.G.B. should introduce code proficiency runs. I recall having seen over the years, similar pleas from other R.S.G.B. members but cannot recall any answer from the Society as to why these runs cannot be made.

Nowadays far too many radio amateurs learn the code just to obtain their licence and then immediately proceed on phone; in fact many of them never touch a Morse key again. What a waste of potential c.w. operators that must be to the country, who might need to call on them in an emergency!

Those who wish to keep their Morse aptitude up to its greatest accuracy must either sit up until 01.30 G.M.T. and copy the W1AW C.P. runs from A.R.R.L. (and who feels like reading 20 or 26 w.p.m. at that time of the morning?), or try and copy the V.E.R.O.N. C.P. runs on 80m each month. The Dutch transmissions are usually jammed by people who seem blissfully unaware of what is going on, and are, therefore, unreadable except perhaps for listeners on the South Coast.

I think there is a very strong case for the R.S.G.B. to start code proficiency runs and to issue certificates to those who successfully complete an exercise at various speeds.

Yours faithfully,
H.M.S. *Ganges*, Shotley, Suffolk. — M. J. MATTHEWS (G3JFF, ex-VS1HU/9M2MA).

DEAR SIR,—G3MRL is right: something needs to be done to arouse a greater interest in c.w. operating amongst the newcomers. A genuine interest, that is, not just an attitude of " Let's try it once for the fun of it." Let them feel that decent operating at a reasonable speed is not beyond them and that, given time, they might develop a real liking for Morse.

Let us have Code Proficiency Certificates by all means, starting with 15 w.p.m.—a speed most self-respecting amateur operators should be capable of taking.

I have one of the certificates awarded by V.E.R.O.N. (the Netherlands Society) and I am sure something equally as attractive issued by the R.S.G.B. would be highly prized by U.K. amateurs.

Yours sincerely,
London, S.W.12. — F. ALLAN HERRIDGE (G3IDG).

Steam Roller?

DEAR SIR,—For shame! I have only been a member of the R.S.G.B. for a relatively short time, but had come to expect better things than the fit of pique which prompted your editorial " Operation Steam Roller." (April issue.)

To begin with, the American Radio Relay League is, as you very well know, a representative, and not an administrative or regulatory, body. If—as is the case here—a majority of its members desires any action or policy from it, it must, as a condition of its existence, initiate such action or policy.

Let us look at this action from the point of view of an American amateur who operates 14 and 21 Mc/s almost exclusively and at the 150 watt level. Prior to the change, the W/K amateurs, who comprise two-thirds of the world's amateur population, were allotted 100 kc/s for phone operation. The rest of the world had 14100-14200 kc/s not available to W/K and 14300-14350 kc/s exclusive in addition to the 14200-14300 kc/s segment which was admittedly nearly useless to them. Nearly 70% of the world's amateurs were, therefore, crowded into 100 kc/s while the remaining 30% had 150 kc/s of usable spectrum. This, of course, resulted in (relatively) thin occupancy of the non-W/K segments. This is understandably a desirable condition from the non-W/K viewpoint, but hardly represents an equitable distribution if we allot frequencies according to the number of amateurs desiring to use them.

Your editorial classed as " extraordinary " the statement that there existed a " demonstrated need for . . . additional . . . space . . ." Two-thirds of the world's amateurs trying to crowd into 40% of the available spectrum would seem very definitely to constitute a demonstrated need.

As far as the power level goes, your classification of the 1kW as more typical of broadcasting than amateur operation is, of course, opinion, and as such unassailable and indefensible. It might be argued with some justice that there are more amateurs operating in the area where 1kW is allowed than at the 150 watt level and so the 1kW level is most typical of amateur operation. The minority should, therefore, fall in line and petition higher power from its respective governments. I will add hastily, that I don't subscribe to this line of thinking, but at the same time I don't accuse the kW boys of being " Steamrollers."

I submit that the change has resulted in the non-W/K amateurs being subjected to something nearer a fair share of the world's QRM and at the same time has enabled the American amateur running less than the kW to find life a little more enjoyable on 14 Mc/s. The 70% now has 150 kc/s and the 30% 100 kc/s which is a long way from a " Steamroller."

Yours faithfully,
Pittsfield, Mass., U.S.A. — WILLARD BRIDGHAM (W1WF).

The Situation is a Mess!

DEAR SIR,—I read with great interest the editorial in the R.S.G.B. BULLETIN for April 1960, concerning the recent change in the American phone band on 14 Mc/s. I would like the members of the R.S.G.B. to know that many of us in the U.S.A. who operate on s.s.b. regularly in the 14 Mc/s band were strongly opposed to this change. The Frankford Radio Club, of which I am a member, forwarded a petition to the Federal Communications Commission opposing the proposed change, as did

many other individuals and groups, but apparently the petition of the American Radio Relay League overrode our objections. I am particularly shocked to read that the views of the R.S.G.B., which were sent to the League, brought forth no answer.

The predictions concerning what would happen if the change were made have unfortunately been only too fully realized. The situation is a mess!

Yours faithfully,

JESSE BIEBERMAN (W3KT)
Bala-Cynwyd, Pa., U.S.A. (Member, R.S.G.B.)

Living with Kilowatts

DEAR SIR,—Your magazine, which is eagerly read each month by our club members, has much to recommend it. On the debit side of the ledger, however, is an attitude that I find difficult to reconcile with the traditional British belief in sportsmanship and fairplay. That attitude is the one in which you and a number of your readers take the stand that the British radio amateur must be pampered by having the exclusive use of a certain portion of the frequency spectrum. Your claim, such as it is, is based on the use of high power by the amateurs in the United States. May I point out to you that of the 200,000-plus amateurs in the United States, only a very tiny minority have high-powered transmitters? Yet we have learned to live with the competition from the nearby high-powered stations without crying for exclusive frequencies for low-powered stations. If we can pursue our hobby with a kilowatt station in the same block, it seems you should not have too much difficulty with interference from a kilowatt station 5,000 miles away. Or is it that you just like to have special privilege?

Yours faithfully,

Aeronautical Center, CARL C. DRUMELLER (W5EHC).
Amateur Radio Club Inc.,
Oklahoma City, Okla., U.S.A.

Praise for the Post Office

DEAR SIR,—In January of this year I contacted an official of the G.P.O. and requested that their engineers should pay me a visit to check second and third harmonic radiation from my s.s.b. transmitter. Soon afterwards no less than five engineers visited me. The transmitter was thoroughly checked in all modes of operation, with and without a low-pass filter and also under dummy load. Last but not least a temporary ground plane aerial was erected in the garden for certain measurements. One of the G.P.O. vehicles had a modern TV set on board and a further set of measurements were taken; this series of tests lasted some six hours and a lot of useful information was obtained.

On their second visit, I had quite an array of new commercial s.s.b. equipment on loan from various suppliers. The G.P.O. engineers duly checked through these various transmitters principally for second and third order harmonic radiation. In all, they spent some 30-40 hours in checking new equipment that I had on hand and even loaned me a low-pass filter whilst checking my own. Nothing was too much trouble for them.

The second prong of attack by these engineers was the investigation of various sets in the neighbourhood; some of the sets had been badly tuned, resulting in interference, some had to be fitted with high-pass filters and one new set was defective and had to be returned to the manufacturers. Finally, the engineers investigated a complaint from a tape recorder enthusiast who strongly objected to my voice appearing on his tape without prior permission!

In conclusion, I would like to state that it appears that many manufacturers of amateur transmitters fail to suppress harmonics to a low enough level. No mention is made in their technical specifications as to the order of suppression achieved. This state of affairs is not good enough and the would-be buyer is led to believe that the equipment is TVI proof. Consultation between the G.P.O. and manufacturers should determine sensible suppression figures and these should be achieved in manufacture.

In view of some adverse criticism of the Post Office in the sphere of TVI and their attitude towards the licensed amateur, I should like to express my thanks to the G.P.O. staff for their help in solving my problems. They were extremely courteous and all matters were handled most diplomatically.

Yours faithfully,

North Finchley. R. R. B. MORGAN (G3KGC).

Phone in N.F.D.

DEAR SIR,—At the last meeting of this Society, a discussion took place on the subject of phone operation on N.F.D., which subject was raised in the letter from the Honorary Secretary of the South Shields and District Amateur Radio Society published in the March issue of the BULLETIN.

The outcome of the discussion was a resolution, passed by an overwhelming majority, to the effect that the Grimsby Society most strongly deprecates any such proposal to introduce phone operation into N.F.D.

Main objections to the idea stated during the discussion were as follows:

The relative ineffectiveness of 10 watts input for phone work would, we feel, lead to a great temptation to pile on the power.

The necessity to have available the extra power supplies needed for efficient modulation would make the use of higher power on c.w. an extremely tempting proposition also.

N.F.D. has, over the past few years, become an international event with more and more countries holding their annual Field Days on the same date, but 10 watts of phone, with the maximum band occupancy and consequent QRM, would make DX, or even European QSOs something of an exception.

Whereas ten c.w. stations in 3 kc/s is quite feasible (with each station readable and rapid contacts possible) if the same bandwidth was occupied by ten stations using phone, none of them would be readable. Whilst the conditions would be the same for all contestants, the lack of contacts would reduce the enjoyment and interest of everyone.

Apart from all this, our society feels that such a step would be just one more step towards the decline in c.w. operating on the amateur bands. There are already far too many who are heard to say over the air that they swotted up their Morse until they passed the test and then forgot it!

We are always short of contest operators on N.F.D., but try to overcome the difficulty by encouraging the new licensees to become proficient on c.w.

Yours faithfully,

H. O. GILLATT (G3LOP).
Grimsby Amateur Radio Society. *Honorary Secretary.*

Series Gate Modulation

DEAR SIR,—I would like to bring up the subject of Series Gate Modulation again. I have been using this system for mobile operation since it was described in the BULLETIN in May and June 1959 and as far as I, and many receiving stations are concerned, it has given excellent results. This letter has been brought about by, shall we say, more critical listeners who have reported that the transmission appears to present a " blasting " effect especially when the listener is only some three or four miles away and the contact is on Top Band.

On one particular occasion, I must have passed within a mile or so of another station working on the band, and I overheard a remark that the mobile station was grossly over-modulating. This is the effect it appears to give to a very local station so I started to carry out one or two tests to try to eliminate this effect. Firstly, I found that if the residual carrier control was backed off to give approximately half of the original power instead of one-fifth to one-eighth as suggested in the original article, reports were very much better. Working on this basis, I am now using the system as follows:

Dispense entirely with the battery, which is usually a bug-bear with modern transmitters. Maximum possible power is then obtained with the " C.W./Phone " switch in the " Phone " position. Loading and tuning is then carried out with the switch in this position. Now switch over to the " C.W." position after loading and tuning have been completed and back off the residual carrier control until a little less than half the original power input to the p.a. is obtained. The resistance network in the original article is adequate to obtain this condition. The a.f. gain control is then slowly advanced until peaks of modulation cause the anode current to approach the original power of the tuning up position.

Admittedly, the system is not quite so economical, but as a number of reports have shown that it now sounds more like anode and screen modulation, it is still very much more economical than high level modulation. I would be most interested to hear if any one else has experimented in this direction.

Yours faithfully,

MAURICE E. TAPSON (G6IF/M).
High Wycombe, Bucks.

Courses of Instruction for the Radio Amateurs' Examination

COURSES of instruction in preparation for the Radio Amateurs' Examination in May 1961 and in most cases the G.P.O. Morse Test are being arranged at the undermentioned centres.

Bognor Regis Technical Institute, Bognor Regis. Classes in preparation for the *R.A.E.* and the *Morse Test* will be held on Wednesdays and Fridays from 7-9 p.m. Enrolment will take place between 5.30-8.30 p.m. on September 12, 13 and 14, 1960

Bradford Technical College, Central Hall, Bradford 5. Full details of the course for the *R.A.E.* to be held on Wednesdays from 7-9 p.m. during the forthcoming session may be obtained from the General Office of the College. The lecturer will be D. M. Pratt (G3KEP).

Doncaster. Those interested in attending a *R.A.E. course* at Doncaster Technical College should contact E. Brailsford, 15 Ayrsome Walk, Cantley, Doncaster, as soon as possible.

Erith Technical College, Erith Road, Belvedere, Kent. Enrolment for the *R.A.E. course* will take place between 6.30 and 8.30 p.m. on September 19 and 20. Further information may be obtained from the Principal or from E. C. Hasted (G3BHF), 54 Plaxtol Road, Erith, Kent.

Glasgow: Allan Glens School, Montrose Street. A *R.A.E. course* will be held on Tuesdays from 7 to 9.30 p.m. and a *Morse code course* on Thursdays from 7 to 9.30 p.m. A *General Radio course* will also be held on Thursday evenings. Enrolment will take place between 7-9 p.m. on September 12-16. Classes will commence the following week. No previous knowledge will be required.

Ilford Literary Institute (High School for Girls), Cranbrook Road, Ilford, Essex. (Adjacent to Gants Hill Station, Central Line.) Two classes have been arranged by the East London R.S.G.B. Group in association with the Essex County Council.

(i) *R.A.E.* An eight month course for those intending to take the examination in May 1961 (Wednesdays, 7.15-9.15 p.m.).

(ii) *Morse and Codes of Practice.* A six month course in preparation for the G.P.O. Morse test for an amateur licence. Arrangements have been made for those who, in the opinion of instructors, have reached the required speed to be tested at the Institute by a Post Office representative.

The fees for students living in the Essex County Council area will be 30/- for the R.A.E. course, 20/- for the Morse and Codes of Practice course or 35/- for the two courses. Students from other parts of London will be admitted as out-county students provided the local authority is informed. Enrolments will take place on September 5-8 from 7-8.30 p.m. but those who intend to enrol are advised to send their names with a s.a.e. to C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex, at once so that a place may be assured. Classes commence during the week beginning September 19, 1960.

London: Islington L.C.C. Men's Evening Institute, Montem School, Hornsey Road, Holloway N.7. The following courses will commence during the week beginning September 26:

(i) *R.A.E.* (Mondays, 7-9 p.m., repeated at the same times on Tuesdays and Wednesdays). Instructors: S. Iles (G3BWQ) and P. F. Bernal (G3KQZ).

(ii) *Morse Code.* (Mondays, 9-10 p.m., repeated at the same times on Tuesdays and Wednesdays.) Instructors: L. Barber and A. Ralph.

Enrolment will take place during the week September 19-23 between 7.30-9.30 p.m. but applications should be made in the first instance to A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex. The fee will be 20/- for either course or 22/6 for both.

London: Wanstead Youth Centre, Nightingale Secondary School, Wanstead. Provided there are sufficient applicants, courses in preparation for the *R.A.E.* and *G.P.O. Morse test* will be held during the coming session. Enquiries should be made to K. Smith (G3JIX), 82 Granville Road, Walthamstow, London, E.17, or, after September 7, to The Warden on Mondays to Thursdays from 7-9.30 p.m.

Manchester: Openshaw Technical College, Whitworth Street, Manchester 11. Courses in preparation for the *R.A.E.* and the *Morse test* will be held during the 1960-61 session. Classes which will include constructional work will be held for those who have passed the R.A.E. Details may be obtained from the Principal. Instructors include G2CMR and G3HZM.

Reading: E. P. Collier Evening Institute, Swansea Road. Provided there are sufficient applicants, a course in preparation for the *R.A.E.* will be held during the coming session. The classes will be held on Wednesdays from 7-9 p.m. and will commence during the week beginning September 26. Enrolment will take place at the Technical College, Kings Road, Reading, from 6-8 p.m. on September 16-19. The fees will be 10/- for those under 18 years of age, 20/- for those between 18 and 21 and 35/- for those over 21.

Wembley Evening Institute, Copland School, High Road, Wembley. Enrolment for courses in preparation for the *R.A.E.* and *Morse test* will take place between 7.15-9.15 p.m. on September 12-15. Classes will commence the following week. The Morse class will be between 7-8 p.m. and the R.A.E. class between 8-10 p.m. on Mondays.

Wymondham Evening Institute, The Modern Secondary School, Wymondham, Norfolk. A course in preparation for the *R.A.E.* will be held on Tuesdays from 7.30-9.30 p.m. commencing September 20. The full course will comprise three terms of approximately 12 weeks each. Fees will vary from 2/6 to 10/- per term depending on age. The instructor will be P. Gower (G3IOR). Enquiries should be addressed to G. Edwards (G2UX), Chapel Street, Barford, Norwich, NOR 385.

Details of courses at other centres were given on page 42 of the July 1960 issue of the R.S.G.B. BULLETIN.

Longleat Mobile Rally Balloon Race

THE winner of the DX Balloon Race at the Longleat Mobile Rally on June 26 was Mr. R. E. Batt (father of A.1437) of Fishponds, Bristol, whose balloon was found at Landudal, Finisterre, North-west France, after travelling 230 miles. The runner-up was Mrs. C. R. Baldwin (wife of B.R.S.18165), also of Bristol, whose ballon reached Plonevez-du-Faou, Finisterre (approximately 215 miles).

The holders of white 057 and pink 24 tickets in the draw at the Longleat Rally have still not claimed their prizes. They are invited to do so by writing to F. H. Chambers (G2FYT), 25 The Crescent, Henleaze, Bristol.

South Shields Mobile Rally

ALTHOUGH there was heavy rain during the afternoon, the mobile rally on July 10 organized by the South Shields and District Amateur Radio Club was a great success, attracting nearly 300 visitors from a wide area. First to arrive was G3MQT/M of Hastings who made the round trip of 717 miles in less than 24 hours! Of the 69 cars, 26 were equipped for /M operation.

The programme included a driving competition (won by G3NCE/M), a radio crossword competition, and two raffles. The prize for the longest distance contact with the rally station was won by G3KQU/M while G3JFH/M's rig was judged the winner of the *concours d'elegance.*

London Lecture Meetings

MESSRS. R. H. Hammans (G2IG) and G. E. Storey (G3HTC) have accepted invitations to lecture to the Society at the Institution of Electrical Engineers during the 1960-61 session.

Mr. Hammans' lecture will be given on October 21, 1960, when his subject will be " Single Sideband."

" Mobile Operation and its Problems " will be the title of Mr. Storey's address on March 24, 1961.

R.S.G.B. QSL Bureau

MEMBERS are reminded that in order to ensure the quickest possible delivery of their incoming QSL cards it is essential to keep the appropriate Sub-Manager supplied with stamped addressed envelopes. Members who do not wish to collect cards addressed to them are asked to inform their Sub-Manager so that the cards may be destroyed.

Mobile Column

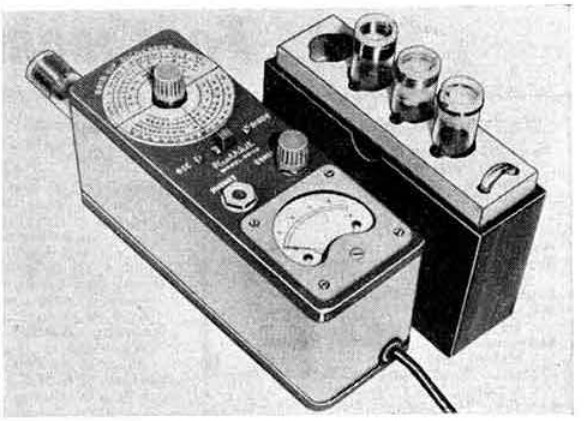
DUE to pressure on space, *Mobile Column* containing reports on recent rallies has been held over.

Leaflets describing **d.c.-d.c. converters** rated at 2-75 watts and ranging in price from £5 8s. 9d. to £8 10s. may be obtained from Aveley Electric Ltd., Ayron Road, Aveley Industrial Estate, South Ockendon, Essex. The firm also markets open type toroids for use in such power supplies at prices varying from 43s. 6d. for a 2-5 watt type to 75s. 9d. for a model rated at 120-150 watts.

Several new Heathkits will be shown at the National Radio Show for the first time, including valve and transistor type **grid dip oscillators**, an r.f. signal generator and a **transistorized portable with two shortwave ranges** and a telescopic aerial. Descriptive leaflets are obtainable from Daystrom Ltd., Gloucester.

A **chassis construction service** for both standard and special items is described in a pamphlet available from P. J. Products, 36 Shenley Road, Dartford, Kent. The firm also manufactures control knob escutcheons intended primarily for use with audio equipment and marked volume, bass control, treble control, input selector or mains on/off.

Moseley Electronics Ltd., 15 Reepham Road, Norwich, have added the **V-4-6 vertical** for 10, 15, 20 and 40m, and the MA-3 **three band mobile whip** for 10, 15 and 20m to the range of aerials available in the United Kingdom. A trap dipole kit, type TD-3, and a **40m two element beam** are other additions. The latter has a 15 ft. boom and requires a turning radius of 19½ ft. A useful small item recently announced is the type Y-TY centre connector/insulator and cable clamp for wire dipoles.



The new Heathkit Model GD1U grid dip oscillator which covers 2-250 Mc/s using four coils. Additional coils are available to extend the range down to 350 kc/s. The instrument incorporates its own power supply and weighs 2 lb.

Slow Morse Practice Transmissions

Time	*Call-sign*	*kc/s*	*Town*
Sundays			
09.00	G3BHS	1810	Southampton
09.30	G3HNJ	1980	Doncaster
	G3ESP/M		
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3HZM	1860	Manchester
12.00	G3LP	1850	Cheltenham
12.00	GI5UR	1860	Belfast
20.00	G3MRA	1915	Southampton
20.30	G3HTA	1850	Exeter
21.00	G2FIX	1812	near Salisbury
Mondays			
18.30	G3NC	1825	Swindon
19.00	G3KTP	1850	Heanor, Derby
19.00	G3LMT	1850	Exeter
20.00 †	G3EWE	1975	Woking
	G3IAF		
20.00	G3GZE	1840	Blackburn
20.00	G3MDH	1915	Southampton
20.30	G3AGN	1875	Felixstowe
20.30	G3MXI	1910	Derby
21.30 †	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
21.45	G3JKY	1900	Beckenham
Tuesdays			
17.30	G2AAM	1875	Swanwick, Derbys.
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
20.00	G2FCI	1850	Exeter
20.00	G3IBI	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MEH	1900	Sutton, Surrey
20.30	G3MZD	1875	Harlow
	G3NKX	1875	Loughton
21.00	G3EFA	1855	Southport
21.00	G3LSC	1875	Poole
	G3MKN		
	G3NUN		
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
Wednesdays			
19.00 †	G3MCJ	1845	Exeter
	G3FLK		
	G2FCI		
	G3HTA		
19.00	G3LZC	1830	Heanor, Derby
19.00	G8RQ	1850	Chesterfield
Wednesdays			
19.45	G3KFE	1950	Stevenage
20.00	G3BHS	1915	Southampton
20.00	G3GZE	1840	Blackburn
20.00	G3INZ	1920	High Wycombe
	G3KRR		
	G3LSK		
	G3MGH		
20.00	G3NFV	1900	Ashstead, Surrey
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MXI	1910	Derby
21.00	G3AGX	1920	Hull
22.00			
21.30	G3HNJ	1980	Doncaster
22.00 †	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Thursdays			
17.30	G2AAM	1981	Swanwick, Derbys.
18.30	G3NC	1825	Swindon
20.00	G3NBV	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3GDZ	1910	Kingsbury, N.W.9
20.00 †	G3EWE	1975	Woking
	G3IAF		
21.30	G3HMY	1850	Exeter
Fridays			
18.30	G3DMN	1880	Ipswich
	G3FVP		
19.30	G3FUA	1850	Kilburn, Derby
19.30	G3MHR	1850	Swanwick, Derbys.
20.00	G3JQS	1915	Totton
20.00	G3NYB	1980	Doncaster
	G3NXZ		
20.00	G3INZ	1920	High Wycombe
	G3KRR		
	G3LSK		
	G3MGH		
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.30 †	G3NPO	1900	Bradford
	G3KSS		
22.00 †	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
20.00	G3MCL	1915	Southampton

† *Alternately*

Forthcoming Events

DATES FOR YOUR DIARY

August 24-September 3.—National Radio and Television Show, Earls Court, London.
August 28.—South Manchester Radio Club and Stockport Radio Society Joint Rally.
August 28.—G6UT's " Ham Party."
September 10.—British Amateur Television Club Convention.
September 11.—Region 1 Field Day.
September 15-17.—R.S.G.B. National Convention, Cambridge.
September 18. — Lincoln Hamfest and Mobile Rally.
October 2.—Region 9 O.R.M. at Weymouth.
October 21.—Lecture Meeting at I.E.E., London.
October 21-23.—Boy Scouts' International Jamboree-on-the-Air.
November 23-26.—R.S.G.B. International Radio Hobbies Exhibition.
December 16.—Annual General Meeting at Over-Seas House, London, S.W.1.
March 24, 1961.—Lecture Meeting at I.E.E., London.

REGION 1

Ainsdale.—Wednesdays, 8 p.m., 37 Hawthorne Grove, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m., Squires Gate Holiday Camp.
Bury (B.R.S.).—September 13 (Reminiscences by G6OM), The George Hotel, Kay Gardens.
Chester.—Tuesdays, 8 p.m., Y.M.C.A.
Crosby (C.A.R.S.).—Tuesdays, 8.30 p.m., Colonsay, Crosby Road South, Waterloo.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield (M. & D.R.S.).—August 23, September 6, 20, 42 Jordangate.
Manchester (M. & D.R.S.).—September 12, October 10, Wellington Hotel, Nicholas Croft, High Street, off Market Street.
Manchester (S.M.R.C.).—Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Fallowfield.
Morecambe (M.A.R.S.).—September 7, October 5, 125 Regent Road.
Preston (P.A.R.S.).—August 23, September 13, 27, St. Paul's School, Pole Street.
Southport.—Thursdays, 8 p.m., The Esplanade.
Stockport (S.R.S.).—August 17, 31, September 14, 28, The Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—August 19 (Lecture by G3GST), September 2 (" Stereo " by G8BM), September 16 (Discussion on Region 1 Field Day). 7.45 p.m., 4 Hamilton Square, Birkenhead.

REGION 2

Barnsley.—September 9 (A.G.M.), September 23, October 14, 7.30 p.m., King George Hotel, Peel Street.
Bradford (B.A.R.S.).—September 6, 7.30 p.m., Cambridge House, 66 Little Horton Lane, Bradford 5.
Halifax.—August 16 (Informal), August 30 (" Printed Circuits " by G3JKD), September 6 (Recorded talk on St. Pierre and Miquelon DXpedition), Sportsman Inn, Ogden.
Scarborough (S.A.R.S.).—Thursdays, 7.30 p.m., Chapman's Yard, North Street, Scarborough.

REGION 3

Birmingham (Slade).—August 26 (Ragchew), September 9 (" Transistor Applications " by Messrs. Chandler and Wates of A.E.I. (Rugby,) Ltd)., 7.45 p.m., Church House, High Street, Erdington. **(South).**—August 25 (" Radio Astronomy " by G3GBS), 7.30 p.m., Friends Meeting House, 220 Moseley Road, Birmingham 12. August 28—Mobile and D/F Contest at Ragley, Alcester.
Stourbridge (S. & D.A.R.S.).—September 6, 8 p.m., Brotherhood Hall, Scotts Road, Stourbridge.
Wolverhampton (W.A.R.S.).—August 15, 8 p.m., Nechells Cottage, Stockwell Road, Tettenhall.

REGION 4

Derby (D. & D.A.R.S.).—August 17 (Colour Transparencies), August 24 (Open Evening), August 31 (D.F. Practice), September 7 (Surplus Sale), September 14 (Open Evening), September 21 (Truvox Demonstration), 7.30 p.m., Room No. 4, 119 Green Lane, Derby.
Derby (D.S.W. Exp. S.).—Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Derby.
Grimsby (A.R.C.).—August 18, September 1, September 15, 8 p.m., R.A.F.A. Headquarters, Abbey Drive West, Grimsby.
Lincoln (L.S.W.C.).—August 24, September 7, 7.30 p.m. Room No. 19, Technical College, Cathedral Street, Lincoln. September 18th Mobile Rally and Hamfest.
Leicester (L.R.S.).—Mondays, 7.30 p.m. (Morse Tuition, 7.30-8.30 p.m.), Club Rooms, Old Hall Farm, Braunstone Lane, Leicester.
Melton Mowbray (A.R.C.).—Next meeting in September.
Newark (N. & D.A.R.S.).—September 6, 7.15 p.m., Northgate House, Newark, Notts.
Newark (Magnus G.S. R.C.).—Tuesday evenings, Junior Physics Lab.
Nottingham (A.R.C.). — Tuesdays and Thursdays, 7.30 p.m., Community Centre, Woodthorpe House, Mansfield Road, Sherwood, Nottingham.
Peterborough (P. & D.A.R.S.).—September 2, 7.30 p.m., Peterborough Technical College.
Retford & Worksop (N.N.R.C.).—Tuesdays, Thursdays, Fridays, 7.30 p.m., Victoria Hall, Eastgate, Worksop, Notts.

REGION 5

Shefford (S. & D.A.R.S.).—August 18 (Quiz), August 25 (Transmitter on the air), September 1 (" How I became a radio enthusiast " by J. Taylor), September 8 (" Locating Faults in TV Receivers " by J. Hirst), September 15 (" Simple Test Equipment " by G3IXG), 7.30 p.m., Digswell House, Shefford.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
High Wycombe (C.A.R.C.).—August 25, (" The Racal RA17 Receiver " by G3NR), 8 p.m., British Legion Hall, St. Mary Street, High Wycombe.
Stroud.—Wednesdays, 8 p.m., Subscription Rooms, Stroud.

REGION 7

Acton, Brentford and Chiswick.—August 16 (" Problem Night,") 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Bexleyheath (N.K.R.S.).—August 25, September 8 (Film—" Hunterston Nuclear Generating Station,") 8 p.m., Congregational Hall, Bexleyheath (nr. Clock Tower).
Croydon (S.R.C.C.).—September 13, 7.30 p.m., " Blacksmiths Arms," South End, Croydon.
Dorking (D. & D.R.S.).—Second and fourth Tuesday in each month, 8 p.m., Star and Garter Hotel, Dorking.
Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, W.5.
East Molesey (T.V.A.R.T.S.).—September 7 (" Printed Circuits " by representative of Phoenix Telephones Ltd.), Carnarvon Castle Hotel, Hampton Court.
Enfield and District.—August 25 (" S.S.B." by J. Smith, G3HJF), 7.30 p.m., George Spicer School, Southbury Road, Enfield.
Guildford (G. & D.R.S.).—Fourth Friday in each month, 7.30 p.m., " The Cannon," Portsmouth Road, Guildford.
Harlow and District.—Thursdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
Holloway (G.R.S.).—Meetings recommence September 2, 7 p.m., Montem School, Hornsey Road, N.7.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford nr. Seven Kings Station).
Kingston.—Lectures alternate Thursdays, Theory and Morse classes weekly, 7.45 p.m., Y.M.C.A., Eden Street, Kingston (Morse at 2 Sunray Avenue, Tolworth).
Mitcham (M. & D.R.S.).—Fridays, 8 p.m., The Cannons, Madeira Road, Mitcham.
New Cross (C.A.R.S.).—Fridays, 7.30 p.m., Sundays 11.30 a.m. (Audio Section last Tuesday in each month, 7.30 p.m.), 225 New Cross Road, London, S.E.14.
Norwood and South London (C.P. & D R.C.).—August 30 (Morse Class and Practical Work), September 10 (" Hi-fi Audio Equipment " by B. H. Arundel), 8 p.m., Windermere House, Westow Street, Crystal Palace.
Romford (R. & D.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
Southgate, Finchley and District.—September 8 (" Aerials " by G3HRH), 7.30 p.m., Arnos School, Wilmer Way, N.14.
South Kensington (C.S.R.S.).—August 16, 6 p.m., Science Museum, South Kensington.

LONDON MEMBERS' LUNCHEON CLUB
will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,
at 12.30 p.m. on Fridays, August 19, September 16, October 21 and November 18, 1960.
Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

REGION 8

Crawley (C.A.R.C.).—August 25 (" Mobile Amateur Radio " by John Rouse, G2AHL), September 8 (Informal), 7.30 p.m., " The Brewery Shades," High Street, Crawley.

REGION 9

Bath.—September 19, 7.30 p.m., Committee Room, Bath Technical College. (No meeting in August.)
Bideford.—First Thursday in each month, 7.30 p.m., alternatively at G2FKO (T. G. Ward), 38 Clovelly Road. ('Phone: Bideford 964) and G3BO (D. H. Jones), Rosebank, Westcombe. ('Phone: Bideford 550.)
Bristol.—August 26 (" Single and Double Beam Oscilloscopes " by R. W. Stronach, Cossor Instruments, Ltd.), 7.15 p.m., Carwardines Restaurant, Baldwin Street, Bristol 1.
Exeter.—Second Thursday in each month, 8 p.m., Y.M.C.A., St. David's Hill, Exeter.
Falmouth (F.R.C.).—First Wednesday in each month, Y.M.C.A., Falmouth.
Torquay.—Second Saturday in each month, 7.30 p.m., Y.M.C.A., The Castle, Torquay.
Weston-super-Mare.—Second Wednesday in each month, 7.15 p.m., Technical College, Lower Church Road, Weston-super-Mare.
Yeovil (Y.A.R.C.).—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff.—September 12—Visit to G.P.O. Exchange. October 10 (A.G.M.), 7.30 p.m., Sgt's Mess, T.A. Centre, Park Street, Cardiff.
Penarth.—September 26 (Members' Equipment Display), 7.30 p.m., R.A.F.A. Club, Windsor Road, Penarth.

REGION 11

Prestatyn (F.R.S.).—September 5 (" Co-axial Cable " by J. Goldberg, G3ETH), 7.30 p.m., Ffrith Hotel, Ffrith, Prestatyn.

REGION 14

Glasgow.—Second Friday in each month, 7.30 p.m., Woodside Halls, Clarendon Street, N.W. (near St. George's Cross Underground).
Prestwick.—Third Sunday in each month, 7.15 p.m., Royal Hotel, Prestwick.

REGION 17

Portsmouth.—Tuesdays 7.30 p.m., Scarrs, 183A Albert Road, Portsmouth.
Southampton.—First Saturday in each month, 7 p.m., Prospect House (back of Gas Board showrooms), Above Bar.

Regional and Club News

Bristol.—More than 60 members, including Herb Bartlett (G5QA), Executive Vice-President of the Society, were present at the July meeting when D. V. Newport (G3CHW) described and demonstrated a number of the latest Heathkits loaned by Daystrom Ltd. including the American " Mohican " transistorized communications receiver. On August 26 R. W. Stronach (Cossor Instruments Ltd.) will be talking about " Single and Double Beam Oscilloscopes." Final arrangements will be made at this meeting for the visit to the G.P.O. Radio Station at Burnham on September 4. Local members willing to take part in the Slow Morse programme are asked to contact the T.R., G2HDR. *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol, 7.

Cheltenham.—There was an excellent attendance at the July meeting when there was a lively discussion on N.F.D., mobile rallies and a projected regional meeting. It was agreed that the group should give serious consideration to offering to arrange such a meeting in 1961. *Town Representative:* John J. Yeend (G3CGD), 30 St. Luke's Road, Cheltenham.

Chiltern Amateur Radio Club.—On September 3 at the High Wycombe Show members will be operating GB3HWS on all bands from 10 to 80m (and possibly on Top Band). All contacts will be acknowledged by a special QSL card. Meetings are held on the last Thursday in each month at the British Legion Hall, St. Mary Street, High Wycombe, commencing at 8 p.m. *Hon. Secretary:* R. Barton, 25 Hillside Road, Marlow, Bucks.

Civil Service Radio Society.—The winter session will commence on September 6 with a talk on radio astronomy. Following meetings will be held on the first and third Tuesdays in each month at the Science Museum, South Kensington. Intending visitors should contact G. Voller (G3JUL) at the Museum (Kensington 6371). Membership is open to all Civil Servants and associate membership to persons in similar employment. Further details may be obtained from the *Hon. Secretary:* G. Lloyd Dalton, 2 Honister Heights, Purley, Surrey.

Cornish Radio and Television Club.—At the July meeting, attended by 24 members, there was an inquest on N.F.D. opened by G2BHW who also gave a talk on the " Birdcage " and triband quad aerials. The meeting ended with a " Question Time " session. *Hon. Secretary:* W. J. Gilbert, 7 Poltair Road, Penryn.

Crawley Amateur Radio Club.—Members were due to visit the South Eastern Electricity Control Centre at East Grinstead on August 11 while John A. Rouse (G2AHL) will be giving a talk on " Mobile Amateur Radio " at the meeting on August 25 at The Brewery Shades, Crawley High Street. Visitors and prospective members will be most welcome. Further information on activities may be obtained from the *Hon. Secretary:* R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley, Sussex.

Members of the Ainsdale Radio Club photographed during a farewell visit to Seaforth Coast Radio Station prior to its closing down and transfer of duties to Anglesey Radio. Before the tour of the station, the Engineer-in-Charge gave an informative talk on the history of Seaforth Radio and its activities. From left to right, G3MJU, G3NKL, G2BBU, G3EFA, G3OEI, S. W. L. Haynes, G3LWQ (Hon. Treasurer), G2DQX (Hon. Secretary), G2CUZ, G3LWK, S. W. L. Illingworth, G8QG (Chairman), G3FNQ, S. W. L. Talbot and G3FXI.

Grafton Radio Society.—Meetings at Montem School, Hornsey Road, Holloway, London N.7, will re-commence after the summer recess on September 2 when the new club transmitter (a KW Victor) will be in operation with a triband beam. A full programme is being arranged for the winter. Details of R.A.E. and Morse classes are given elsewhere in this issue. *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

Halifax and District Amateur Radio Society.—Recent activities have included operation of G3MDW/A at the Halifax Agricultural Show on August 13. An informal meeting is planned for August 16 while G3JKD will give a talk on Printed Circuits on the 30th. G3LD is presenting W1PFA's recorded talk on the St. Pierre and Miquelon DXpedition at the Sportsman Inn, Ogden, on September 6. *Hon. Secretary:* Arthur Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Harlow and District Radio Society.—The winner of the balloon race at the society's mobile rally on July 3 was G. Pooley of Pond House, Scotts Hill, Southminster, whose label was picked up in Minster Road, Sheerness, Kent, four days later.

Harrow, Radio Society of.—At the meeting on August 12 a talk on frequency measurement was due to be given while Bob Ford's (ex-AC3SS and AC4RF) recorded R.S.G.B. lecture on his experiences in Tibet is to be given on August 26. Meetings are held on Fridays at 8 p.m. in the Science Lab., Roxeth Manor Secondary School, Eastcote Lane, South Harrow. *Hon. Secretary:* S. C J. Phillips, 131 Belmont Road, Harrow Weald.

Leeds Amateur Radio Society.—At the A.G.M. W. Dixon was elected *President* and D. Tong, *Chairman.* W. Ripley and D. Dinsdale were re-elected *Hon. Treasurer* and *Hon. Secretary* respectively. The programme for 1960-61 is being arranged and the first meeting will be held at the Swarthmore Education Centre, 4 Woodhouse Square, Leeds 3, on September 21. *Hon. Secretary:* D. Dinsdale, 69 Spen Lane, Leeds 16.

Liverpool and District Amateur Radio Society.—Members operated GB2LS at the society's exhibition at the Liverpool Show in July which was attended by 72,000 people, a large percentage of whom visited the station. More than 400 contacts were made with amateurs in 45 countries. No TVI was reported by adjoining TV demonstrations. Personal QSOs were made with representatives from GI, GM, GW, W6 and ZS. The display included s.w.l. and RTTY stations, model control gear, test equipment and display units loaned by Mullard and B.I.C.C. *Hon. Secretary:* H. James (G3MCN), 448 East Prescot Road, Knotty Ash, Liverpool 14.

Newbury and District Amateur Radio Society.—On August 21 a society jamboree will be held at Stroud Green on the south side of Newbury. E. Mollart (B.R.S.10977), winner of the Wessex D/F Qualifying Event and many others, is to give a talk on Direction Finding at the meeting in The Canteen, Elliotts of Newbury, West Street, on August 26. *Hon. Secretary:* J. A. Gale (G3LLK), " Wild Hedges," Crookham Common, near Newbury.

Peterborough and District Amateur Radio Society.—More than 60 radio amateurs and short wave listeners from a wide area of East Anglia attended the " Bucket and Spade " Party at Hunstanton on July 3. The talk-in station was G3ANM/P and visitors were welcomed by G3JEC and G3KPO, T.R. for Peterborough. Prizes for those travelling the longest distance went to G3JEQ of Great Bookham, Surrey, and to G3NFV of Ashstead, Surrey.

Purley and District Radio Club.—From the club's newsletter it is learnt that G3NRW/A was operated at the local Summer Fair as part of the club's participation. On September 16 Roger Kennedy will be giving a talk on Radio Control. A Top Band net is held on Sundays at 8 p.m. *Hon. Secretary:* E. R. Honeywood (G3GKF), 105 Whytecliffe Road, Purley, Surrey.

Reading Amateur Radio Club.—At the Palmers Hall, West Street, Reading, on August 27, G3GHE will lecture on Transmission Lines. Visitors and prospective members will be most welcome. Plans are being made to take part in the Jamboree-on-the-Air and assistance from amateurs in the area is invited. *Hon. Secretary:* R. G. Nash (G3EJA), 9 Holybrook Road, Reading.

Reigate Amateur Transmitting Society.—G3NKS/A and G3NKT/A were in operation at The Fuller's Earth Union Fete on July 9 and all contacts have been acknowledged by special QSL cards. The main transmitter was a five-band rig, recently completed by B.R.S.22458, feeding 20 and 40m dipoles. A

Some of those present at the inaugural meeting of the Royal Naval Amateur Radio Society on June 25, 1960.

home-built equipment competition is being arranged. Future activities include a surplus equipment sale and visits to Gatwick Airport (October 8) and Tatsfield B.B.C. station. The next meeting at The Tower, Redhill, is arranged for August 20 at 7.30 p.m. Publication of the society's newsletter *Feedback* has been resumed. *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill.

Royal Air Force Amateur Radio Society.—The society will again be providing a section of the large R.A.F. stand at the National Radio Show later this month. Visiting members are asked to make themselves known on the stand and to leave a QSL card for display. The main attraction of the exhibit will be demonstrations of the assembly of Heathkit apparatus.

Royal Naval Amateur Radio Society.—The inaugural meeting was held at H.M. Signal School, *H.M.S. Mercury*, Leydene, Petersfield, Hants., on June 25. Those present included G3ENI, G3IPV, G3MRC, G3LIK, G3KEL, G3JFF, G3HIS, G3LET, G3AWO, G3HLW, G3BQR, G3CED, G3ACP, G3FMN, G3JAF, G3JZV, G3CNO, G2DZT, G3ODJ, G8IX, G8WC, ex-G3DOT and B.R.S.21022. The following were elected to serve on the committee for 1960: *Chairman*—G. Tagg (G8IX); *Hon. Secretary*—M. Matthews (G3JFF); *Hon. Treasurer*—Lt. J. J. Riggs; *Committee Members*—Commander A. J. R. Pegler, R.N. (G3ENI), D. Pilley (G3HLW) and D. Allen (ex-G3DOT). Corporate membership is open to serving or past members of the R.N., Royal Marines, W.R.N.S., Naval Reserves and Commonwealth Navies. Associate membership is open to persons who are or have been connected with any of these services in a civilian capacity. Junior membership is open to Navy personnel under the age of 20. Applications for membership should be addressed to the Hon. Secretary, Royal Naval Amateur Radio Society, at *H.M.S. Mercury*.

South Yorkshire Amateur Radio Society.—At the meeting on July 12, results during the society's first half-year were reviewed and the following officers and committee members confirmed in office: *Chairman*—Joe Clennell (G3HNJ); *Hon. Treasurer*—Albert Field; *Hon. Secretary*—Walter Farrar (G3ESP), 2a Highbury Avenue, Bessacarr, Doncaster; *Committee Members*—Ted Brailsford and Ted Judkins. Meetings are held at the Stag Inn, Dockin Hill Road, Doncaster, on the second and fourth Thursdays in each month and are preceded by a half-hour Morse session beginning at 7.30 p.m.

Wirral Amateur Radio Society.—At the meeting on August 19 G. McCracken (G3GST) will give a talk entitled " The Blind Person's Approach to Amateur Radio " while " Stereo on a Budget " will be the subject for John Wylde (G8BM) on September 2. An inquest on the Region 1 Field Day will be held on September 16. Two recent issues of the society's newsletter contain an excellent article on transistors by C. Hubbard (G3CSZ). *Hon. Secretary:* A. Seed (G3FOO), 31 Withert Avenue, Bebington, Wirral, Cheshire.

Can You Help?

● R. Lester (A.2349), 10 Southwood Avenue, Highgate, London N.6, who requires information on the S meter and/or the manual for the Hallicrafters S20R receiver?

HOUGHTON-LE-SPRING MOBILE RALLY

Hetton Moor Farm, Easington Lane, near Houghton-le-Spring, Co. Durham

Saturday, August 20, 1960

RALLY STATIONS

G3CKC/A will be active on 1980 kc/s from 10.15 a.m.
G3NMD/A will operate on 7 Mc/s.

The Rally is being arranged in connection with the Hetton Flower Show. Attractions will include Show Jumping and a display by the Royal Signals Motorcycle Team. Refreshments available. R.A.E.N. members and mobile stations will be particularly welcome.

(The Rally site is on A182 which runs between the A19 and A690. Routes will be signposted.)

Organized by the Houghton-le-Spring Amateur Radio Society.

SOUTH MANCHESTER & STOCKPORT RADIO RALLY

Sunday, August 28, 1960

The first assembly point will be Davenport Cinema Car Park, Stockport, for those wishing to take part in or to follow the treasure hunts (one for those equipped with mobile gear, one for those without radio).

The final assembly point will be the Pavilion Gardens, Buxton, where morning coffee, luncheons, afternoon tea and suppers will be available in the Pavilion Restaurant and light refreshments in the Pavilion Sun Lounge. The Concert Hall affords ample accommodation for special events being organized in a " hamfest " atmosphere. Other attractions include model railways, a children's treasure hunt and boating and paddling pools.

Admission to the Pavilion Gardens is 1/- for adults and 3d. for children. Free Rally car park.

Top Band and 2m stations will be in operation at both assembly points.

Further details from C. M. Denny, G6DN, 18 Willoughby Avenue, Didsbury, Manchester 20.

Organized by the South Manchester Radio Club and Stockport Radio Society.

LINCOLN MOBILE RALLY AND HAMFEST

Technical College, Cathedral Street, Lincoln

Sunday, September 18, 1960

The programme will include a lecture on transistors in broadcast receivers by D. E. A. Harvey, Grad.I.E.E., and a sale of surplus equipment. Alternative entertainment is being provided for the ladies. Tickets, price 8/- including high tea, will be on sale at the door. Assembly will commence at 1.30 p.m. Further details may be obtained from Mrs. D. E. Woolley (G3LWY), Rochmount, Saxilby, Lincoln.

Organized by Lincoln Short Wave Club.

Affiliated Society Representative

THE following is an addition to the list published in the December 1959 issue:

Bournville Radio Society (G6BV): R. W. Kidner (G6KI), 160 Franklin Road, Bournville, Birmingham.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, March 21, 1960, at 6 p.m.

MARCH 1960 MEETING

Present: Dr. R. L. Smith-Rose (Immediate Past President in the Chair), Messrs. N. Caws, D. Deacon, C. H. L. Edwards, K. E. S. Ellis, R. C. Hills, E. G. Ingram, J. D. Kay, A. O. Milne, L. E. Newnham, F. K. Parker, F. A. Russell, G. M. C. Stone, P. H. Wade, A. C. Williams, E. W. Yeomanson (Members of the Council) and John Clarricoats (General Secretary).

Apology for Absence. An apology for absence was submitted on behalf of the President (Mr. W. R. Metcalfe) who was indisposed.

Membership

Resolved (i) to elect 76 Corporate Members and 33 Associates; (ii) to grant Corporate membership to 10 Associates who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to the R.A.F. Aldergrove Amateur Radio Club and the R.A.F. Akrotiri Amateur Radio Club.

I.A.R.U. Region I Conference Folkestone

Resolved (i) to appoint the following to represent the Society at the I.A.R.U. Region I Conference to be held in Folkestone from June 13 to 17, 1960: The President, The Executive Vice-President, Dr. R. L. Smith-Rose (Immediate Past President), Mr. A. O. Milne (Past President), Mr. F. G. Lambeth (V.H.F. Manager), Mr. D. Deacon (Chairman, TVI/BCI Committee), Mr. R. C. Hills (Chairman, Contests Committee), Dr. A. C. Gee (Chairman, R.A.E.N. Committee); (ii) to convene a meeting of delegates about one month prior to the opening of the Conference.

Regional Scheme

Resolved to request the Membership & Representation Committee to examine a recommendation put forward by the East London District concerning the Regional Scheme of Representation.

Geneva Radio Conference

A resolution passed at a meeting of Glasgow members offering congratulations and thanks to those who had represented Amateur Radio at the Geneva Radio Conference was submitted. The terms of the resolution were noted with satisfaction.

R.S.G.B. Radio Hobbies Exhibition

It was reported that (a) the sum of £100 had been donated to the Society by the organizer of the 1959 R.S.G.B. Radio Hobbies Exhibition; (*b*) the organizer had paid for the cost of stand erection and other services rendered to the Society to a total amount of £36 8s.; (*c*) the 1960 Exhibition would take place in the Old Hall of the Royal Horticultural Society, London, from November 23 to 26, 1960.

Official Regional Meetings

Resolved to authorize the Region 9 Representative to organize an O.R.M. in Weymouth on Sunday, October 2, 1960.

World Refugee Year

Resolutions passed at meetings in East London and Chingford requesting the Council to consider making a contribution towards World Refugee Year, in view of the international aspect of Amateur Radio, were submitted.

Resolved (i) to inform the East London District, and the Chingford Town Group that the Society's Memorandum and Articles of Association do not permit the Council to use Society monies for the purpose suggested; (ii) to authorize the Secretary to publish a suitable paragraph in the Society's Journal inviting groups of members and Affiliated Societies to send donations to the World Refugee Year Fund.

Membership Record

Arising from consideration of a further resolution passed at a meeting of East London members regarding membership records it was reported that all R.R.s had reently been supplied with up-to-date card files of members in their respective Regions.

" Diagnosis of TVI "

Mosley Electronics, Inc., of Missouri, U.S.A. sought permission to reprint parts of Mr. R. H. Hammans' article " Diagnosis of TVI " for distribution on a non-commercial basis to U.S. amateurs seeking advice on TVI problems.

Resolved to grant the necessary permission subject to Mr. Hammans raising no objection and to proper credit being given to the author and to the Society. (Mr. Hammans raised no objection—EDITOR.)

Reports of Committees

Minutes of Meetings of the following Committees were submitted as Reports:

R.A.E.N., February 27, 1960; Scientific Studies (Informal Meeting), March 3, 1960; Contests, March 10, 1960.

Resolved (i) to receive the Reports; (ii) to accept and adopt the Recommendations contained therein.

The Recommendations dealt with contest results, printing of contest log sheets, representation at the I.A.R.U. Region I Conference in Folkestone, and agenda items for that Conference.

Advertising

It was suggested that the Society's Advertising Managers should be asked to seek advertising support from firms outside as well as within the radio industry. Hotels and holiday resorts were mentioned in particular. It was agreed to pass on the suggestion to the Society's Advertisement Managers.

The meeting terminated at 9.10 p.m.

APRIL 1960 MEETING

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, April 25, 1960, at 6 p.m.

Present: The President (Mr. W. R. Metcalfe in the Chair), Messrs. D. Deacon, C. H. L. Edwards, R. C. Hills, E. G. Ingram, J. D. Kay, A. O. Milne, L. E. Newnham, F. K. Parker, F. A. Russell, G. M. C. Stone, P. H. Wade, A. C. Williams, E. W. Yeomanson (Members of the Council) and John Clarricoats (General Secretary).

Apologies for Absence: Apologies for absence were submitted on behalf of Messrs. H. A. Bartlett, N. Caws, K. E. S. Ellis and R. L. Smith-Rose.

* * *

Welcome to the President

Mr. Newnham, on behalf of his colleagues, extended a warm welcome to the President and congratulated him on making a good recovery from his recent illness. Mr. Newnham then handed to Mr. Metcalfe his Chain of Office and Mr. Metcalfe made a suitable reply.

Headquarters

It was agreed to sign a new lease for the continued use of accommodation at New Ruskin House for a further period of three years at a rental £100 per annum greater than is at present being paid.

The Hon. Treasurer had expressed the opinion that the Landlords' offer was a very fair one bearing in mind the high rents now being asked for office accommodation in Central London.

Cash Account

Resolved to receive the Cash Account for March 1960 as prepared and submitted by the General Secretary.

The Secretary reported that a member who wished to remain anonymous had donated the sum of £5 to the Society in appreciation of the fine work done by the QSL Bureau. A letter of thanks had been sent to the member concerned.

Membership

Resolved (i) to elect 104 Corporate Members and 27 Associates; (ii) to grant Corporate membership to three Associates who had applied for transfer.

Application for Affiliation

Resolved to grant affiliation to the South Birmingham Radio Society.

O.R.M.s

Resolved to authorize the Region 2 Representative to organize a raffle in connection with the Redcar O.R.M.

I.A.R.U. Region I Conference

Consideration was given to the arrangements for the I.A.R.U. Region I Conference and authority given to arrange a reception for the delegates at a cost not exceeding £35.

I.A.R.U. Calendar

Resolved to vote in favour of the proposal to admit L.A.R.A. (Angola) to membership of I.A.R.U.

National Convention

Consideration was given to a number of matters connected with the forthcoming Convention in Cambridge.

Call Book

Resolved to place an order for 7,000 copies of the 1961 edition of the *R.S.G.B. Amateur Radio Call Book.*

Aerial Mast Appeal

Resolved to contribute a sum not exceeding £20 towards the cost of an appeal to the Ministry of Housing and Local Government by a member (Mr. F. I. R. Hunt, G3LNQ) against a decision by his local planning authority (Harrow Borough Council) who had refused to grant him permission to erect a second mast within the curtilage of his house.

Licence Contraventions

It was reported that the G.P.O. had recently written to a number of amateurs drawing their attention to contraventions of the Amateur (Sound) Licence. In general, the complaints had related to the operation of amateur stations by unauthorized persons. The contraventions had come to light mainly as the result of an increase in Post Office monitoring, following complaints of unlicensed operation.

Amateur Transmitting Licences

Consideration was given to a suggestion that the Society should ask the Post Office to arrange for transmitting licences to be renewed locally in

the same way that television and broadcast licences are renewed over the counter.

After studying the reply received by a member who had raised the matter with the Post Office it was agreed to take no action on the suggestion.

Reports of Committees

Resolved to receive, as Reports, the Minutes of meetings of the Technical, V.H.F., TVI/BCI and Contests Committees and to adopt the recommendations contained therein.

The recommendations dealt with the forthcoming I.A.R.U. Region I Conference, various V.H.F., Contest and TVI/BCI matters.

Arising from consideration of the Report of the Technical Committee the Secretary submitted correspondence which had been exchanged with the author of the single sideband commentary regarding the decision of the Committee that the feature should in future appear bi-monthly instead of monthly. It was reported that about 40 members had written to protest against the decision of the Committee.

Resolved to inform the Technical Committee that the Council has authorised the Editor to assign one page each month for a single sideband commentary.

Arising from consideration of the Report of the V.H.F. Committee it was agreed to suggest to the R.A.E.N. Committee that the frequency in the band 144-146 Mc/s to be used for R.A.E.N. purposes should be 144·120 Mc/s.

Arising from consideration of the Report of the Contests Committee it was agreed to change the dates of the 1960 21/28 Mc/s Contest from November 19/20 to December 3/4 in order to avoid a clash with an A.R.R.L. Contest.

The meeting terminated at 10 p.m.

MAY 1960 MEETING

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, May 30, 1960, at 6 p.m.

Present: The President (Mr. W. R. Metcalfe in the Chair), Messrs. H. A. Bartlett, N. Caws, C. H. L. Edwards, K. E. S. Ellis, R. C Hills, E. G. Ingram, J. D. Kay, A. O. Milne, L. E. Newnham, F. K. Parker, F. A. Russell, G. M. C. Stone, P. H. Wade, A. C. Williams, E. W. Yeomanson (Members of the Council) and John Clarricoats (General Secretary).

Apologies for absence: Apologies for absence were submitted on behalf of Dr. R. L. Smith-Rose and on behalf of Mr. D. Deacon who was indisposed.

* * *

I.A.R.U. Region I Conference

Mr. N. Caws and Mr. C. H. L. Edwards were appointed additional delegates to the I.A.R.U. Region I Conference replacing Dr. R. L. Smith-Rose (who could attend for one day only) and Mr. D. Deacon (who was indisposed).

Membership

Resolved (i) to elect 89 Corporate Members and 36 Associates; (ii) to grant Corporate Membership to two Associates who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to: B.B.C. Club Ariel Radio Group, TV Section; Magnus Grammar School Radio Society, Newark-on-Trent (known as Magnus Radio Society).

Radio Club of Argentina Trophy

It was reported that Mr. A. L. Budlong (Secretary of the I.A.R.U.) proposed to bring with him to the Folkestone I.A.R.U. Region I Conference a photograph of the Radio Club of Argentina Trophy which had been awarded to the R.S.G.B. A suitable scroll, together with the photograph, would form the basis of a token presentation.

National Convention

It was reported that the Mayor of Cambridge (Councillor C. A. Mole, J.P.) had agreed to open the Convention at 12 noon on Thursday, September 15, 1960, and to attend the Convention Dinner on Saturday, September 17, 1960.

Consideration was given to a number of other matters relating to the Convention.

Resolved (i) that Messrs. Newnham, Milne, Stone and Hills shall act as Chairmen at Lecture Sessions; (ii) that all members of the Council shall be entitled to attend the Convention as official delegates and to claim for out-of-pocket expenses; (iii) that the cost of the official luncheon after the opening ceremony (estimated at about £15) and the cost of tickets for special guests at the dinner (estimated at about £12 plus table wines) shall be a charge against the Society.

Aerial Mast Appeal

A report was submitted on an appeal by Mr. F. I. R. Hunt (G3LNQ) against the decision of the Harrow Borough Council refusing him permission to erect a second aerial mast at the rear of his house.

Aerial Masts

Resolved that in future when a member informs Headquarters that his application for permission to erect an aerial mast has been refused by his local authority, the correspondence shall be referred to the TVI/BCI Committee.

Amateur (Sound) Licence

Several members of the Council reported that the Post Office had recently written to a number of amateurs complaining about minor breaches of the regulations.

Members of the Council concerned were asked to send copies of the letters to the Secretary. (If it appears from the letters that the complaints are of a trivial nature the matter will be taken up with the G.P.O — EDITOR.)

Council Meetings

It was agreed as an experiment to hold the July meeting of the Council on a Saturday afternoon If the experiment is a success it was agreed to consider holding one meeting each quarter on a Saturday afternoon.

Service Valve Equivalents

Resolved to agree in principle to the publication of a new R.S.G.B. *Service Valve Equivalents* booklet and to authorize the Secretary to accept the most satisfactory estimate.

Weymouth O.R.M.

Resolved to authorize Messrs. Edwards, Hills, Russell and Yeomanson to represent the Council at the Region 9 O.R.M. in Weymouth.

Bulletin Questionnaire

It was agreed to produce a printed questionnaire inviting members attending Convention and other Society functions to express an opinion on BULLETIN features, etc.

Region 12 O.R.M.

It was reported that a highly successful O.R.M. had been held in Aberdeen during the weekend May 21/22, 1960.

Region 1 O.R.M.

It was agreed to hold an O.R.M. in Blackpool during April 1961.

Reports of Committees

Minutes of meetings of the following Committees were submitted as Reports: Membership and Representation, April 25, 1960; Exhibition, May 10, 1960; Technical, May 11, 1960; Contests, May 12, 1960.

Resolved to receive the reports and to accept the various recommendations except one put forward by the Contests Committee that a telephony section on 3·5 Mc/s and 7 Mc/s be included in the 1961 N.F.D. event.

The recommendations dealt with the scheme of representation, the forthcoming Radio Show at Earls Court, various technical and contest matters.

V.H.F. Beacon Station

It was agreed to purchase a second-hand CT63 Signal Generator for use in connection with the Society's V.H.F. Beacon Station programme.

It was stated that transmissions from the Beacon Station would probably commence in about three months' time.

The meeting terminated at 9.30 p.m.

For Your Bookshelf and Shack

R.S.G.B. PUBLICATIONS

A Guide to Amateur Radio (Eighth Edition)
Price 3/6 (by post 4/-)

R.S.G.B. Amateur Radio Call Book (1960 Edition)
Price 3/6 (by post 4/-)

The Morse Code for Radio Amateurs
Price 1/- (by post 1/4)

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Valve Technique - **Price 1/6 (by post 1/10)**
V.H.F. Technique - **Price 1/- (by post 1/3)**

The two booklets may be purchased for 2/6 (post paid)

AMERICAN PUBLICATIONS

Orders for the following American publications which are usually available from stock can only be accepted from residents in the United Kingdom and British Commonwealth. Prices quoted include cost of postage and packing.

Radio Amateur's Handbook, 1960 (*A.R.R.L.*) -	34/-
CQ Sideband Handbook (*Cowan*) - - -	25/-
Mobile Manual for Radio Amateurs (*A.R.R.L.*)	24/6
CQ Mobile Handbook (*Cowan*) - - -	24/-
Antenna Book, 8th Edition (*A.R.R.L.*) - -	19/-
Television Interference—Its Causes and Cures (*Nelson Publishing Co.*) - - - -	16/-
CQ Anthology (*Cowan*) - - - -	16/-
Single Sideband for the Amateur (*A.R.R.L.*) -	14/-
Hints and Kinks, Volume V (*A.R.R.L.*) - -	10/-
Course in Radio Fundamentals - - -	10/-
How to Become a Radio Amateur (*A.R.R.L.*) -	4/6
Learning the Radiotelegraph Code (*A.R.R.L.*)-	4/6
QST (*A.R.R.L.*) Published monthly - (p.a.)	43/6
CQ (*Cowan*) Published monthly - - (p.a.)	44/-

Prices for American publications are subject to alteration without notice.

R.S.G.B. MEMBERS ONLY

Society Tie (all silk) - - - - - -	16/6
Blazer Badge - - - - - -	7/-
Car Badge (R.S.G.B. Emblem) - - -	5/-
Car Badge (R.S.G.B. Emblem with call-sign) (5 characters)† - - - - -	10/6
Car Badge (De Luxe type with call-sign)† - (*Postage on overseas orders 5/6 extra*)	17/6
Call-sign Lapel Badges (5 characters)† - -	6/-
Rubber Stamp (R.S.G.B. Emblem) - -	11/-
Stereo Block (R.S.G.B. Emblem) - -	8/-
Miniature Pennants (R.S.G.B.) 12" long for car	7/9
Headed Notepaper (R.S.G.B.) per 100 sheets (Large)	7/9
(Small)	6/-

† *Delivery 3-5 weeks.*

MISCELLANEOUS ITEMS

Aveley Radio Tape Measure - - -	6/-
Short Wave Receivers for the Beginner (*Data Publications*) - - - - -	6/-
Wireless World Valve Data (*Iliffe*) - -	6/-
Webbs' Log Book - - - - -	5/-
Quality Amplifiers (*Data Publications*) - -	5/-
Radio Amateur Operator's Handbook (*Data Publications*) - - - - -	4/-
Guide to Broadcasting Stations (*Iliffe*) - -	4/-
F.M. Explained (*Trader Publishing Co.*) - -	3/-

All prices include postage unless otherwise stated.

R.S.G.B. Bookshop, New Ruskin House, Little Russell Street, London, W.C.1.

EXCHANGE AND MART SECTION

ADVERTISEMENT RATES. Members' Private Advertisements 3d. per word, minimum charge **5s. Trade Advertisements 9d. per word,** minimum charge **12s.** All capitals **1s.** per word, minimum charge **18s.** Write clearly. No responsibility accepted for errors. Use of Box number **1s. 6d.** extra. Send copy and remittance to **National Publicity Co. Ltd., 20-21 Red Lion Court, Fleet Street, London, E.C.4, by 22nd** of month preceding date of issue.

ALL TYPES OF VALVES REQUIRED for cash. State quantity and condition.—Radio Facilities Ltd., 38 Chalcot Road, N.W.1. (PRImrose 9090.) (236

AVO SIGNAL GENERATOR, Valve Tester (Taylor 45A) and Avometer Model VII for sale—or will exchange all for good Mobile Rig.—GM3BXW, 26 St. Clair Avenue, Giffnock, Renfrewshire. (212

BRAND NEW RK75 VALVES for transmitter or modulator, 4/- each; also QV04/7, excellent for two metres, 6/- each or four for £1.—Jeapes, 165 Cambridge Road, Great Shelford, Cambridge. (201

E.D.C. ROTARY CONVERTER. 240V d.c., 230V a.c., 1·9A, completely overhauled, £5; " Transformers ": Pri. 230V., 0·96A, Sec. 500-0-500V, 170m/A, 4V4A c.t., Choke 250m/A, 20H, £1/5/-; Pri. 230V, 2·18A, Sec. 500-0-500V, 500m/A, Choke 500m/A, 10H, £2; Pri. 230V, Sec. 300V, 38m/A, 4V4A c.t., 12/6; Push Pull Output. 50W - load 3·300 to 600 ohms; speaker transformer 50W, 600 to 7·5 ohms, £2; Class C Wavemeter, vibrator p.p. spare valve, phones, £1/10/-; Receiver Type R1124A, 6 valves, 15/-; Receiver 1155 and manual, £5; Weston Electric Ammeter, large scale—20-0-20, 200-0-200 m/A, £1/5/-; artificial aerial Type 1B, 136 to 15,000 Kc/s, 10/-; visual indicator Type 3 (10Q/4), 12/-; Impedance balancing networks, 300-2,200 c.p.s. and manual, £1; " Wireless World " 1944-1953.—Phone: STA. 9357 after 8 p.m., G3ICT, 70 Fairholt Road, N.16. (200

FOR SALE. R107 PLUS RF24, £10, o.n.o., carriage extra. Several RF24 units, 15/- each p.p. 3/6; RF25, 9/- p.p. 3/6.—S.W.L. clearing out, changing QTH.—A. H. Jubb, 1 Cumberland Avenue, Grimsby. (213

GELOSO D.C./A.C. INVERTER, 12V d.c. input, 110V a.c., 45W output, accurate steady 50 c/s, designed mobile supply for tape recorder, cost a packet, only £5; Thermador Transformers, 680-0-680V, 225m/A, 20/-; 5V c.t. 6A with 6·3V c.t. 6A, 12/6; 10V c.t. 5A with 10V c.t. 10A, 12/6, all stepped primaries, potted. Also 580-0-580V, 200m/A with 5V 3A, 6·3V, 5A, 25/-; chokes 10H, 20m/A, potted, 15/-; Thordarson super job, 12H, 400m/A, 20/-. Bags of nice gear, including Aerovox 1,000V oil filled capacitors, crystals, relays, microphones, valves, etc. S.a.e. for list.—G3GJX, 6 Cheltondale Road, Solihull. (205

G3AAE MOVING TO ESSEX for business reasons, offers superb TVI proof QTH on crest of 500 ft. Surrey hill. Large garden with 40 ft. mast and Mosley three element triband remotely rotatable beam. Delightful semi-detached superior three bedroomed house, brick garage attached. Hall and 16 ft. lounge have pine strip flooring, oak beams and plate rails. Claygate fireplace and Crittal leaded windows. Bathroom, separate w.c. and kitchen (18 by 8 ft.) all half tiled. Excellent decorative order and delightful, easily run, secluded garden. 45 minutes London Bridge, 2 minutes shops, golf course and open country. £4,250 for quick sale.—40 Fryston Avenue, Coulsdon, Surrey. (Tel.: UPLands 5417.) (215

HAMOBILE MKI, complete. Exchange for DX40 and VF-1U or equivalent, offer.—G3GNR, 98 Hundred Acres Lane, Amersham, Bucks. (199

LG300-MK2.—Complete with modulator and power supplies. Relay control, £69 o.n.o.—G3GHB, 31 Franklin Road, Birmingham, 30. (218

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

PANDA PR120V, Minimitter low pass Filter, £50.—G3DOR, 18 Knowle Park Avenue, Staines, Middlesex. (207

QSL CARDS, G.P.O. approved. Log books, cheapest, best, prompt delivery. Samples.—Atkinson Bros., Printers, Looe, Cornwall. (206

SALE.—Cossor 339A double beam Oscilloscope, £15; Cossor 1320 television alignment Generator, £10; G.E.C. Miniscope, £8; T.C.S. Transmitter, £10; P/U for T.C.S. transmitter, £4; Taylor 65B Signal Generator, £7, o.n.o.—G3OBX, 69 Woodfield Drive, Gidea Park, Romford, Essex. (210

(Continued on next page)

EXCHANGE & MART (contd.)

SALE.—"MODERN PRACTICAL RADIO & TELEVISION," Vols. 1, 2, 3 and Circuits/Data by Caxton. Offers—A. D. Tregale, G3LMT, 41 Normandy Road, Exeter, Devon. (203

SALE.—5 in. 3 ohm Speakers (Elac, Allen). 7/6 each. Valves, quantity each type—EB91, 2/6; ECL80, EBF80, ECH81, EF89, ECC85, UL41, UY41, UCH81, UY85, UF89, 5/6; EF86, PCL83, 7/-; UCL83, 10/-. Burgoyne Solder Gun, £1. All above new, unused. R1155A one band u/s, 35/-; Flat screen duplicator, 30/-; Class D Wavemeter 6V, a.c., £3/10/-. All carriage extra.—Box 208, National Publicity Co. Ltd., 20/21 Red Lion Court, Fleet Street, E.C.4. (208

SALE OR EXCHANGE. Brittania (Maxi Q) Coil Pack; Avo Signal Generator (just overhauled by Avo); Maxi Q and 'P' coils. Wanted. R107 IF/AF chassis.—Edge, 8 Church Street, Malpas, Cheshire. (214

THE INTERNATIONAL RADIO AMATEUR YEARBOOK 1960/1961, available August 22nd. Contents include Directory of Societies and Clubs, Net Directory, International Contests Diary, U.K. Frequency Predictions, A.R.R.L. Countries list, maps, reviews of the past year and much other information. Price 4/- by post from P. Casling (G3MWZ), 35 Hotson Road, Southwold, Suffolk. (209

WANTED.—All types of communication receivers, test equipment, tape recorders, amplifiers, etc. Prompt cash payment.—Details to R.T. & I. Service, 254 Grove Green Road, Leytonstone, London, E.11. (LEYton 4986.) (241

WANTED R.S.G.B. BULLETIN VOLS. 33 and 34, part of Vol. 35.—Cameron, Coombe Cottage, Pitchcombe, Glos. (202

WANTED FOR CASH.—Good clean communication receivers and s.s.b. equipment. Please state price.—Short Wave (Hull) Radio, 30-32 Princess Avenue, Hull. (Telephone 18953.) (983

WANTED. GENUINE AR88D S METER, reasonable price paid; also BULLETIN for November 1956. For sale: Minibeam, £5, buyer collects, London area.—Box 211, National Publicity Co. Ltd., 20/21 Red Lion Court, Fleet Street, E.C.4. (211

APPOINTMENTS SECTION (*Situations Vacant*)

COMMUNICATIONS ENGINEERS required to service Mobile Radio v.h.f. equipments. Applicants should reside in Bath, Bournemouth, Bristol, Exeter, Plymouth, Southampton, Torquay areas, and have had at least three years' recent experience in this field. Excellent opportunities. Write giving fullest details to: R.E.E. Telecommunications Ltd., Telecomm Works, Market Square, Crewkerne, Somerset. (204

RADIO OPERATORS.—Air Ministry have vacancies for temporary Radio Operators (male). Good prospects of permanent, pensionable appointments and promotion. Initial appointments in U.K. but subsequent tour of duty in Far East likely. Trainees £440 to £635; Qualified Operators £530 to £1,040. (These rates are subject to a small deduction at Provincial stations and small increase in London and Overseas.) Special allowances payable for overseas service. Applicants under 40 with Morse speed 15-18 w.p.m. preferred.—Apply in writing to: Air Ministry C.E. 4d., London, W.C.1, or any Employment Exchange quoting Cheadle 3. (109

APPOINTMENTS SECTION (*Situations Vacant continued*)

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