RSGB

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JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

RSGB BULLETIN

Incorporating RADIO COMMUNICATION

ASSISTANT EDITOR
Trevor R. Preece, G3TRP

EDITORIAL ASSISTANT
John J. Adey, A4663

ADVERTISEMENT MANAGER
Mrs P. D. Harvey

EDITORIAL OFFICE
RSGB Headquarters
28 Little Russell Street,
London, WC1
01-405 7373
01-405 2444

ADVERTISING OFFICE
Sawell and Sons Ltd.,
4 Ludgate Circus,
London, EC4
FLE 4353

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VOLUME 43 No. 9

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ROYAL SIGNALS

AT THE NEW HORTICULTURAL HALL

Radio Amateurs serving in Royal Signals have again collaborated to provide one of the displays which you will find at the

RADIO ENGINEERING AND COMMUNICATIONS EXHIBITION

27th to 30th September 1967

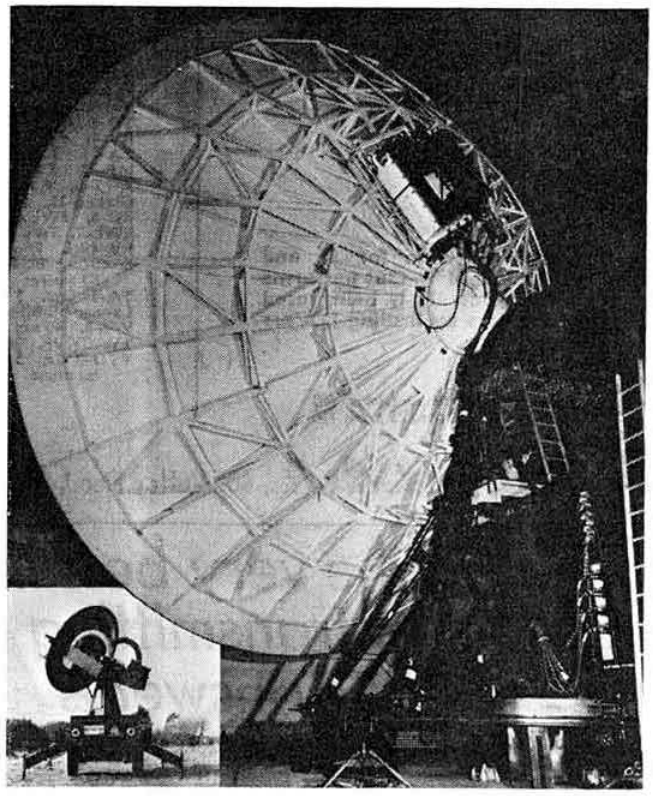
Whilst not strictly Amateur Radio, IDEX has been developed by a team whose main aim is the same as Amateurs the world over, communications.

The photograph shows the main dish of one of the three fixed stations mentioned below, whilst the insert shows the IDEX trailer and antenna array which will be on display.

IDEX is a highly mobile satellite communication ground station which has been designed at the Signals Research and Development Establishment, Christchurch.

This small station supplies two way communication, through a United States I.D.C.S.P. type satellite, to any one of Britain's three large ground stations. One of these is at Christchurch, England, one in the Middle East and the third in the Far East.

Many of the soldiers who provide the communications for the Army are keen Amateurs and are members of the Royal Signals Amateur Radio Society, whose HQ Station is G4RS, located at Blandford in Dorset. This station will be operating throughout the Exhibition as GB3RCS.



ALL PART OF THE SERVICE

Would you like to know the exact frequency of the crystals you have? Our test equipment will again include a Digital Frequency Meter and we will be pleased to check your crystals and provide a certificate of calibration.

The stand will be manned by members of Royal Signals, specialists in their own field, ready to discuss the equipment on show or just have a chat about Amateur Radio.

Would you like to have details of career prospects in Royal Signals? We shall have all the information available and will be pleased to talk it over.

WE LOOK FORWARD TO MEETING YOU AT

THE NEW HORTICULTURAL HALL

RADIO SOCIETY OF GREAT BRITAIN

NCORPORATED 1926

MEMBER SOCIETY INTERNATIONAL AMATEUR RADIO UNION

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RSGB INTERNATIONAL RADIO ENGINEERING AND COMMUNICATIONS EXHIBITION

Wednesday 27 September to Saturday 30 September, 10 a.m. to 9 p.m. daily
The Royal Horticultural Society's New Hall, Victoria, SW1

This year the Exhibition will be held at a new venue which will give improved facilities for the exhibitors and will provide larger and better catering arrangements. The Hall is only five minutes walk from the Victoria main line terminus, and about the same distance from St. James's Park Station on the District Line. There are, in addition, numerous bus services running along Victoria Street, some three or four minutes walk from the Hall.

Again this year the RSGB stand is the largest yet, and it is still not possible to have the space to display all aspects of the Society's activities.

RECEPTION AREA

Following the pattern of previous years, this section of the stand will be in the charge of the Executive Vice-President, John Graham, G3TR, assisted by Mrs. Eileen Vaughan, BRS26612, Council and Committee Members, and Headquarters Staff. Reception will attempt to answer all members' enquiries, take orders for badges, subscriptions to overseas periodicals, and accept new or renewed subscriptions for the RSGB.

A most important part of the stand staff's duties will be to welcome, and assist in any way possible, the very many overseas visitors to the Exhibition.

EXHIBITION STATION

This will operate on the v.h.f. bands and, once again, will be manned by Ron Vaughan, G3FRV and operators from the Crawley Group.

GB2VHF will operate on the 4m, 2m or 70cm bands, depending on activity, using a.m. These transmissions will be radiated through aerial systems located above the Hall.

Operating in co-operation with the RSGB Station will be the RTTY Station organized and manned by members of the British Amateur Radio Teleprinter Group. RTTY transmissions will use 850 c/s shift at a speed of 50 bauds.

A special QSL card will be despatched automatically via the RSGB QSL Bureau for each contact with either station. Alternatively, visitors to the Exhibition may claim their QSLs at the Headquarters station stand. Your own QSL should be sent via the Bureau clearly marked GB2VHF via G3FRV.

HOME CONSTRUCTED EQUIPMENT

Following the excellent response last year the Society's Exhibition Committee has decided that the same pattern shall be followed in 1967. Only exhibits of a high technical or constructional standard will be displayed under the following arrangements:

(i) All items submitted for exhibition will be subject to acceptance by the Exhibition Committee.

(ii) Entries will be accepted (*a*) as items which have been the subject of published articles in the RSGB BULLETIN during the period January 1966 to date. It should be made clear that only the member writing the original article will be allowed to enter; (*b*) from members who are prepared, if required, to write a constructional article for publication in the RSGB BULLETIN featuring their entry, this article to be paid for at the normal rates.

(iii) Entrants will be required to certify that their entries were constructed entirely by themselves from commonly available materials and components.

(iv) RSGB members only will be eligible.

(v) The Horace Freeman trophy will be awarded for the most original piece of equipment on show.

(vi) Additional prizes may be awarded at the discretion of the judging Committee.

(vii) Members wishing to enter should send a brief description of their proposed entry to the organizer, Mr. A. J. Gibbs, G3PHG, 6 Dairyfields, Gossops Green, Crawley, Sussex, immediately.

Prizes will be presented by the President of the Society at 6.30 p.m. on Saturday, 30 September, the last day of the Exhibition.

INTRUDER WATCH

It is hoped that there will be a display organised showing the methods used by the Intruder Watch in locating and identifying commercial stations operating in exclusive amateur bands. The Organizer of the Society's Intruder Watch, Colin Thomas, GW3PSM, will be available to answer your questions.

EDUCATION COMMITTEE EXHIBIT

Following the success of the Noviset equipment introduced last year there will be further items in this range to be seen, together with examples built by young amateurs. This exhibition is in the hands of L. Newnham, G6NZ, and Tim Hughes, G3GVV, and will also contain a colour slide display introducing Amateur Radio.

BOOK SHOP

The range of publications handled by the Society is always increasing and there will be a very large selection on sale at the Book Shop. An entirely new publication, " World At Their Fingertips " will be on sale for the first time and there will be a completely new edition of the Radio Data Reference Book, and the 1968 Edition of the RSGB *Call Book*. The Call Book will contain a considerable amount of operating information which has been included for the first time. Unfortunately, the Fourth Edition of the *Amateur Radio Handbook* will not be available. The Stand Manager will again be Mr. F. Ruth, G2BRH.

RECEPTION FOR OVERSEAS VISITORS

The Society is organizing an informal Reception for overseas visitors, on the lines of that held in previous years, for Friday, 29 September at 7.30 p.m. Between 7.30 and 8.30 p.m. entry will be restricted to overseas visitors and invited guests, but Society Members may obtain tickets for this period at a cost of 7s. 6d. The Society hopes that all visiting amateurs will make themselves known at the reception area, when arrangements will be made for them to attend the reception.

OTHER FEATURES

The Radio and Space Research Station will stage a display of their latest equipment, and all the Services and the G.P.O. will have exhibits. It is hoped that a model of the successful *OSCAR III* satellite will be on display. Many well known organizations manufacturing equipment and components for the radio amateur will be exhibiting.

RSGB INTERNATIONAL
Radio Engineering and Communications Exhibition
1967

To be opened at 12 noon on Wednesday, 27th September, 1967 by Dr. J. Saxton, Director of the Radio and Space Research Station.

There will be exhibits by manufacturers of radio and electronics equipment, the three Services, the General Post Office and the Radio and Space Research Station.

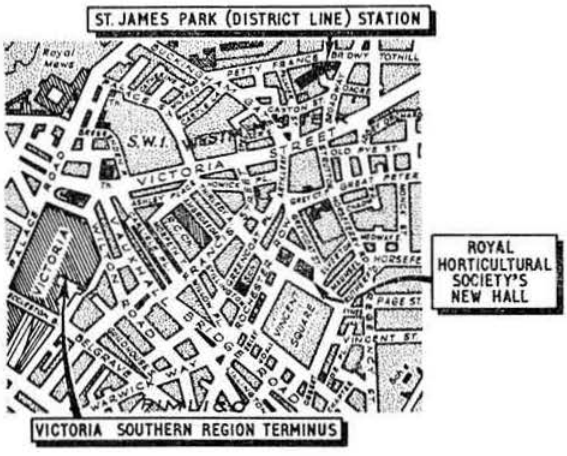
The exhibition station, GB2VHF will be in operation on 4m., 2m., and 70cm.

There will be a display of equipment constructed by members for which the Horace Freeman Trophy and other prizes will be awarded.

A demonstration of Colour Television will be given by Rank Bush Murphy

A reception for overseas amateurs will be held on the evening of Friday, 29th September.

There will be a free draw for a communication receiver and a ticket is enclosed in this issue.



The Royal Horticultural Society's New Hall

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27-30 SEPTEMBER
INCLUSIVE

Open 10 a.m. to 9 p.m.

ADMISSION 3/-

Modern Station Control

By G. F. GEARING, A.M.I.T.P.P., G3JJG*

THE techniques of proper station control have only been sparsely treated in articles appearing in Amateur Radio publications for some years at least. It is, though, an important subject in its own right and this article illustrates the progress which has been achieved at one station. Every system does have its own requirements, or peculiarities if you like, but the principles and circuits which were evolved at G3JJG should be readily adaptable, and with this in mind it is hoped that amateurs will be inspired to take a closer look at the adequacy of their own control facilities.

System Planning

It is good practice to chronicle the final objectives before looking for the means of achieving them. Station control may be sub-divided as follows:

1. Fast accurate netting at a level close to that of the received signal.
2. Rapid tuning of the transmitter stages, using a signal which has long-term amplitude stability so that day-to-day performance can be checked easily.
3. Full monitoring of the transmitted signal, when using either c.w. or s.s.b.
4. Total quieting of the transmitter when the station is at receive.
5. Automatic control by voice or key (but without listen-through).
6. One control switch only and a minimum of leads between units comprising the station.

The first and second targets were reached by the single switch control circuitry of the G3JJG s.s.b. exciter [1], using diode switching of the re-inserted carrier and negative cut-off bias on the driver and output stages. All the remaining targets can be achieved but a number of basic ideas must be examined before the full control complex is discussed i.e., earth switching, bias muting, diode grouping, d.c. switching superimposed on r.f. leads and aerial changeover.

Earth Switching

No originality can be claimed for use of the control technique known as " extending an earth". Each circuit to be controlled is arranged or re-arranged so that it can be made or broken by applying an earth or removing it. For instance, if one side of an aerial change-over relay is connected directly to the supply, the relay can be energised by switching the other side of the coil to earth, as in Fig. 1.

Fig. 1. " Extending an earth " method of controlling relays.

This earth connection can be applied at the relay terminals or within the unit or it may be extended to any point in the station. The lead is not likely to carry unwanted r.f. components because it is earthed when the station is at transmit. Thus all control wiring could be connected through multi-core cable to one master control switch, which may be located in the transmitter, receiver or elsewhere.

Bias Muting

In an s.s.b. transmitter using valves most signal-amplifying stages operate at some point between class A (high impedance low power stages) and class B (high power amplifiers). It is usually necessary to provide a bias supply so as to define accurately stage operating points and this supply can be arranged in a form which is very suitable for control by earth switching.

In the circuit shown in Fig. 2, only one single-pole switch to earth is necessary. With S3b at RECEIVE, the bias voltage on both stages is determined only by the divider R101 and R102 and this cut-off level is applied to the driver through R28, R16 and R13 and to the final through R28 and R20. When switched to NET, the final remains cut-off but the driver bias is reduced towards the valve operating point by the divider R16, R15 and VR2. At TRANSMIT the earth is applied to VR3 and, via CR3 to R15 so that the driver bias is set by R16 and R15 and the final bias is set by R28 and VR3.

Note the high capacitance values used for C113 and C114; even a small amount of ripple on the bias supply will degrade the transmitted note. Resistors R13 and R20 separate the two bias feed chains and CR3 acts as a buffer diode, as described below.

Diode Grouping

A semiconductor diode may be used to keep apart differing d.c. levels. With the cathode (red spot) less negative than the anode, i.e., cathode positive related to the anode, only leakage current of the order of microamps can flow through the diode. When the conditions are reversed, i.e., cathode more negative than anode, the diode will pass current with very little voltage drop.

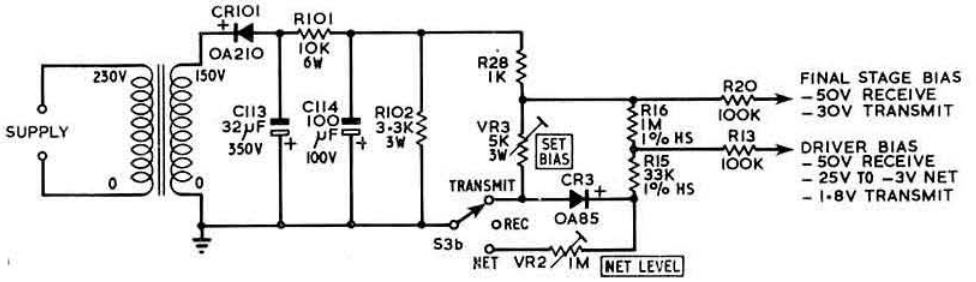
Thus, it is possible to join together switching functions so as to reduce all the control requirements within a unit to one single-pole switch, viz, CR3 in Fig. 2. With S3b at NET, CR3 cathode potential cannot be more negative than one half the full bias voltage due to the divider formed by R16, R15 and VR2 but CR3 anode stands at the full bias voltage through VR3; CR3 cathode is less negative than its anode and the diode cannot conduct. However, on TRANSMIT, CR3 anode is earthed so that its cathode *must* be more negative, the diode conducts and both circuits are earthed.

D.C. Switching on R.F. Leads

Many station layouts employ a separate receiver and transmitter, or a receiver, exciter and linear amplifier. Where a single switch is used to control the station, the single control lead from each other unit must be routed to a common switch in one of the equipments, thus requiring additional wiring. Remember, however, that it is usual for one coaxial lead to connect the various units, carrying the received and transmitted signals. By the judicious use of blocking capacitors and r.f. chokes, these control and signal leads may be combined as in Fig. 3.

With the master control switch at RECEIVE, the bottom of the receiver r.f. gain control is earthed through the r.f. chokes, coaxial cable and switch. On TRANSMIT, this earth is removed so that the receiver gain is reduced to the setting of the monitor gain control and the transmitter bias is switched as in Fig. 2. Additionally, the aerial change-over

* 65 Ringwood Close, Furnace Green, Crawley, Sussex.



relay, RLA, is energised from —12V through the buffer diode, CR102. CR108 suppresses the transient voltage spike generated as the current through the relay coil collapses to zero.

D.c. is blocked from the receiver front-end coils and from the aerial by C101 and C104. The effect of the d.c. earth on signals is nullified by the r.f. chokes. The control points are bypassed to r.f. by C102 and C103.

Fig. 2. A transmitter bias supply with switching for transmit-receive, arranged for control by earth switching.

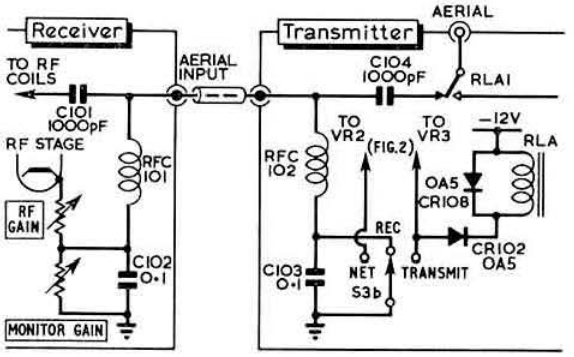


Fig. 3. Controlling the gain of a receiver r.f. stage by applying d.c. control via the coaxial cable connecting the aerial relay to the receiver r.f. circuits. Isolation is provided by use of r.f. chokes and blocking capacitors.

Aerial Changeover

It is quite permissible to use a triode-connected valve as a cathode follower to protect the receiver from the transmitted signal. However, unless the grid of the valve is biased far beyond cut-off (>150V), problems may arise when high-power is used. Without bias, the stage has limited isolation so that the monitored signal may be heavily distorted due to receiver overload, transistor front ends are placed in danger and TVI may be worse because of non-linearity in the over-driven cathode-follower stage.

A suitable aerial changeover relay is easy to control, gives excellent isolation and is useful for the realisation of the complete control circuit.

Complete Circuit

All circuitry associated with the control functions is illustrated in Fig. 4 and includes single switch changeover

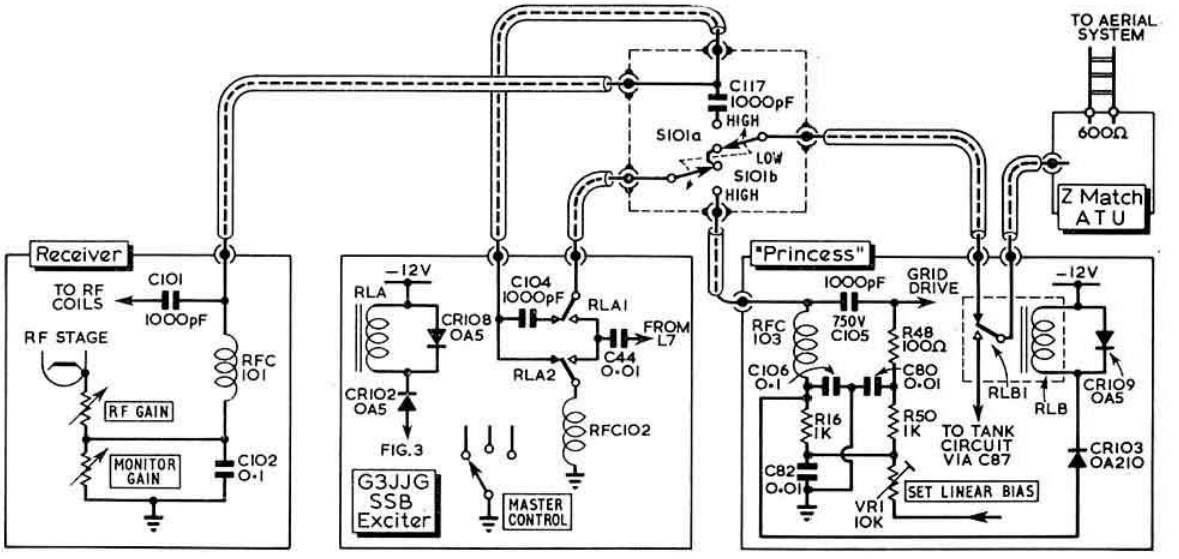


Fig. 4. The complete transmit-receive switching arrangements at G3JJG, using the G3JJG s.s.b. exciter and Princess transmitter. Component references below 100 are existing parts in the equipments.

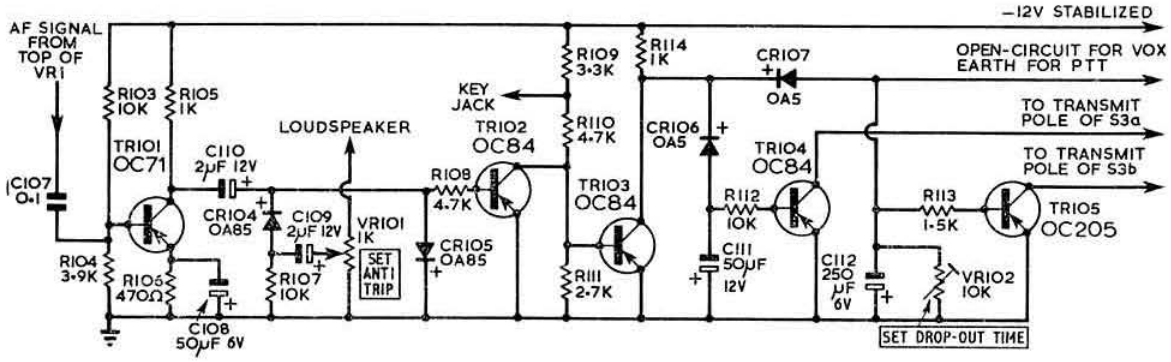


Fig. 5. A VOX system with provision for loudspeaker anti-trip and key operation.

from low to high power operation, i.e., linear out and in circuit. The power amplifier of the " Princess", [2] a pair of TT21 valves, is driven by the output of the exciter, across passive grid resistors of 80 ohms. Component references refer to the original articles but values are given for all components.

Low Power Operation. With S101 switched to LOW POWER, the linear amplifier is not used and remains permanently at standby. The control sequence for the two major states is as follows:

Receive: Master control switch ensures that the exciter is muted and relay RLA is unenergised (Fig. 2 and 3). Remote end of receiver r.f. gain control is returned to earth through RFC101, RLA2, RFC102 and the interconnecting cables.

Transmit: Master control switch places exciter in transmit condition and RLA is energised through CR102. R.f. output is fed to the a.t.u. through C44, RLA1, S101b, RLB1 and the interconnecting cables. The operation of RLA removed the extended earth from the receiver, at RLA2, so that the monitor gain control is placed in circuit, reducing the gain of the receiver.

High Power Operation. With S101 switched to HIGH POWER, the exciter output is routed to drive the linear amplifier to about 250 watts p.e.p. input.

Receive: The exciter is muted by the master control switch. The receiver control earth is extended as before through RFC101, RLA2, RFC102 and the cables. The linear amplifier is biased to cut-off through VR1, R50 and R48 because R16 is not connected to earth; relay RLB is unenergised.

Transmit: Master control switch places exciter in transmit condition and RLA is energised through CR102. R16 in the linear is earthed through RFC103, S101b, RLA1, RLA2, RFC102 and the cables so that the bias falls to the point set by VR1. The main aerial changeover relay RLB is energised through CR103, the receiver earth is broken at RLA2 and the gain reduced. R.f. from the exciter is fed through C44, the control path and C105 to the linear amplifier input and the amplifier output is connected through RLB1 to the aerial tuning unit.

VOICE OPERATED CONTROL

In the control system outlined so far, one master control switch has been used for all functions. However, in the G3JJG s.s.b. exciter, this switch has three wafers so as to keep carrier re-insertion switching away from bias switching and also to facilitate the use of vox. The circuit given in Fig. 5 is peculiar to this equipment but the general circuit principles may be adapted as necessary.

Transistor Switches

Transistor switches are used to control each of the circuit groups instead of wafers on the master control switch. When a transistor with current gain β is connected in the common-emitter configuration, it will operate as a switch when two conditions are satisfied:

1. When the switch is closed, i.e. transistor " on," base current I_b must exceed a value

$$I_b = \frac{V\ \text{supply}}{\beta\ R_L}$$

2. When the switch is open, i.e. transistor " off," the base must be held slightly positive referred to its emitter.

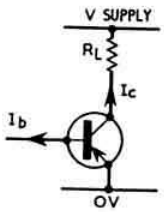


Fig. 6

If the base current is switched on and off by the voice signal, then the collector voltage will be about −0·2V in case (1) and at or near supply voltage in case (2). Thus the transistors can be used as noiseless, fast switches. Strictly speaking, a small positive bias should be applied in case (2) but only one −12V supply is available. However, operation is quite reliable and circuit values are calculated to give about 3 times the minimum turn-on base current so that the transistors saturate rapidly.

VOX Operation

Under quiescent conditions, TR102 cannot conduct because it has no d.c. path for the flow of base current. TR103 is switched on by the base current flowing through R109 and R110 and so TR103 collector stands at about −0·2V; both TR104 and TR105 are switched off because base current cannot flow. The controlled circuits stand in the receive condition.

The a.f. signal is derived from the top of the a.f. gain control, VR1 in the exciter, and fed through C107 to the conventional amplifier stage, TR101. Negative half-cycles of the amplified a.f. signals are rectified by CR105 so that TR102 can draw transient base current through R108. At the instant of conduction, TR102 collector current flows through R109 and R110, robbing TR103 of all base current and this transistor must switch off. Its collector voltage

rises towards −12V so that TR104 draws base current via CR106 and R112 and TR105 draws base current via CR107 and R113. Both transistors are switched on, C111 and C112 are charged and the system is switched to transmit.

In between syllables of speech, TR102 switches off and TR103 switches on. However, the exponentional discharge of the timing capacitors C111 and C112 holds TR104 and TR105 switched on and the system at transmit and each succeeding syllable replaces the charge. The discharge rate of C111 in conjunction with R112 is about 0·5 second and this time constant must always exceed that of C112 and R113, VR102 so as to avoid " grabbing " of the transmitted voice signal. VR102 is set for the relay drop-out time required; at the end of this time, the relay controlled by TR105 is de-energised and the system reverts to receive.

Loudspeaker Anti-trip

Anti-trip facilities are provided at the base of TR102. Audio from the loudspeaker is picked up by the microphone and normally the negative half-cycles will be rectified by CR105 to operate the vox circuits. However, a portion of this signal is connected directly from the loudspeaker voice coil connections through VR101 and C109 and the positive half-cycles are rectified by CR104 so as to counteract the microphone signal.

The provision of loudspeaker anti-trip necessitates an extra lead between the receiver and the unit containing the master control switch, carrying the a.f. from the loudspeaker. However, if it is really important to keep the single lead principle, the circuit suggested in Fig. 7 may be tried. As can be seen, the lead carries d.c., a.f. and r.f. simultaneously and the results of this idea must be tried experimentally. The possibilities for unwanted feedback effects are tremendous!

Key Control

Control of the station from the key when using c.w. is given by keying the junction of R109 and R110 to earth, thus removing base current from TR103 and operating the vox circuit in a similar manner to that described. Note that the selection of values in the resistive chain R109 to R111 was found critical as there must be a direct d.c. connection between the control junction and one end of the carrier re-insertion diode switch in the exciter.

Press-to-Talk

When VOX is not required, the junction of CR107 and R113 is switched to earth. This function can be performed by an additional wafer on the master control switch or a separate single pole toggle switch. In the first case, an additional NET position should be provided next to the VOX position so that the sequence is TUNE:NET:RECEIVE: TRANSMIT:VOX:NET. Thus it is necessary to switch one position only when netting.

Components

In general, no components are critical although TR105 must withstand a maximum of −50V between emitter and collector and must switch at least 50mA when on. The r.f. chokes can be about 1mH and not more than 10 ohms resistance. Any form of construction may be used and in the prototype all the circuits were placed on a piece of Lektrokit about 2 in. by 1½ in.

Conclusion

Thus a control system is produced, using simple ideas but arranged in such a way that only a total of six coaxial cables are necessary to join the units in a receiver/exciter/linear complex. The vox circuit uses a total of five transistors and four diodes and has a sensitivity of about 50mV r.m.s. However, it must be stressed that each station will have differing requirements and this article is intended more as a guide than something to copy exactly. The writer wishes to acknowledge the help given by G3PTN in trying these ideas.

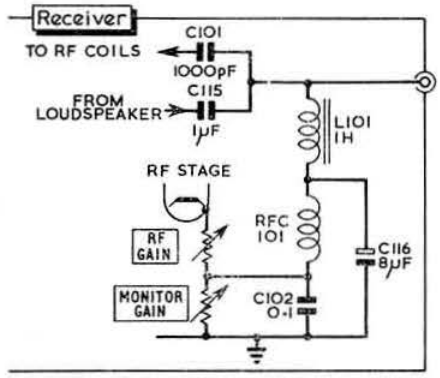


Fig. 7. A modified circuit for coupling the receiver to the transmitter and VOX unit with the anti-trip signal also fed along the coaxial aerial cable. The cable thus has to cope with r.f., a.f. and d.c. Increased anti-VOX sensitivity will be realised if a 600-ohm receiver a.f. output is available.

References

[1] " The G3JJG s.s.b. Exciter," RSGB BULLETIN, July 1966, p. 443, August 1966, p. 513, September 1966, p. 574.

[2] " The Princess Transmitter", RSGB BULLETIN, July 1964, p. 422, August 1946, p. 505.

TEST REPORT

By R. F. STEVENS, G2BVN

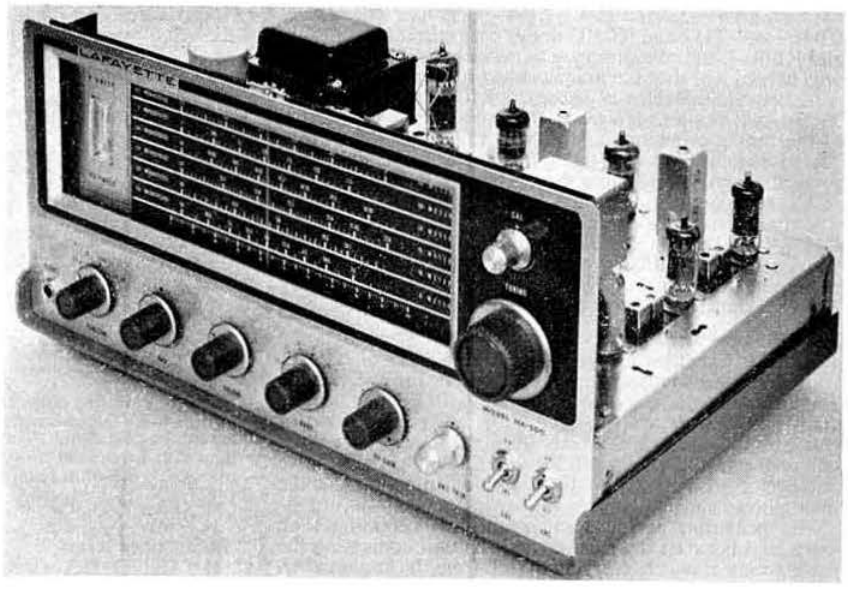


Fig. 2. A view of the front panel of the receiver showing the straight line dial markings. The two pairs of cans containing the ceramic filters can be seen at the right end edge of the chassis.

The Lafayette HA-500 Receiver

RECENT articles describing and evaluating commercial equipment have been compiled with the aid of a modern electronics laboratory and the precise and factual results published will have been of considerable assistance to readers of the BULLETIN in deciding whether the equipment meets their requirements. When an HA-500 receiver was offered for review it was felt that to subject this equipment to the full range of tests would be rather similar to entering a family saloon in the Grand Prix, bearing in mind that the price was in the economy class rather than a figure associated with communications equipment. Hence this review has been written with the aid of equipment and facilities which might be found in any amateur station and by comparison with receivers already in use and of which the performance had already been established.

General Description

The receiver features double frequency conversion with a crystal controlled second mixer. The first i.f. is 2608 kc/s and the second mixer operates on 2153 kc/s producing a second i.f. of 455 kc/s. The straight line dial utilises cord drive and a flywheel giving a smooth action. The selectivity of the i.f. section is determined by two ceramic filters giving a bandwidth of between 4 kc/s and 5 kc/s at 6dB down. There is a separate product detector and b.f.o. for c.w. and s.s.b. reception with a single crystal diode detector for a.m. A shunt type noise limiter uses the triode section of a 6AQ8 and two differing time constants are used on the a.g.c. system for a.m. and s.s.b./c.w. A voltage regulator supplies 105 volts to the twin triode/tunable first oscillator, the second section of which is used as a cathode follower. A silicon diode is used as a rectifier in the power supply giving an h.t. line voltage of 190. There is a connection to a separate winding on the power transformer which feeds the first oscillator and which is not controlled by the operation of the mains switch on the receiver. If the receiver is connected to a socket outlet which is always "live" then the heater of the first oscillator will run continuously. Connections from the a.g.c. line, h.t. line and audio output are brought out to a socket on the rear chassis apron for remote control purposes. There is a crystal calibrator incorporated in the receiver but the 100 kc/s crystal is not supplied and is obtainable as an accessory.

Circuitry

Conventional practice has been followed and there are no "trick" circuits incorporated in an endeavour to cut corners. The r.f. valve, a 6BZ6, is the same type as is used in the Drake 2B and Sommerkamp FR100B receivers [1] and gives reasonable gain without the need for any special precautions. An aerial trimmer is supplied and this comprises a small variable capacitor connected between earth and the grid of the r.f. amplifier. A second small variable capacitor is mounted above the tuning control on the front panel and this is connected in parallel with the oscillator section of the main tuning capacitor; it is used to correct minor calibration differences using the crystal calibrator as the reference oscillator. The r.f. gain control comprises a potentiometer in the cathode circuits of the r.f. amplifier and first i.f. amplifier.

Frequency Coverage:	3·5 to 4 Mc/s 7·0 to 7·3 Mc/s 14·0 to 14·35 Mc/s 21·0 to 21·45 Mc/s 28·0 to 29·7 Mc/s 50 to 54 Mc/s
Aerial Input Impedance	50 ohms
Selectivity	Bandwidth ± 2 kc/s at 6dB down. ± 6 kc/s at 60dB down.
Sensitivity	Less than 1·0μV for 10dB S/N ratio
Image Rejection	Better than 40dB
I.F. Rejection	Better than 40dB
Intermediate Frequencies	First: 2608 kc/s; second: 455 kc/s
Audio Output	One watt (max)
Output Impedance	8 and 500 ohms
Power Consumption	65 watts
Dimensions	15 in. wide, 7½ in. high, 10 in. deep
Weight	23 pounds

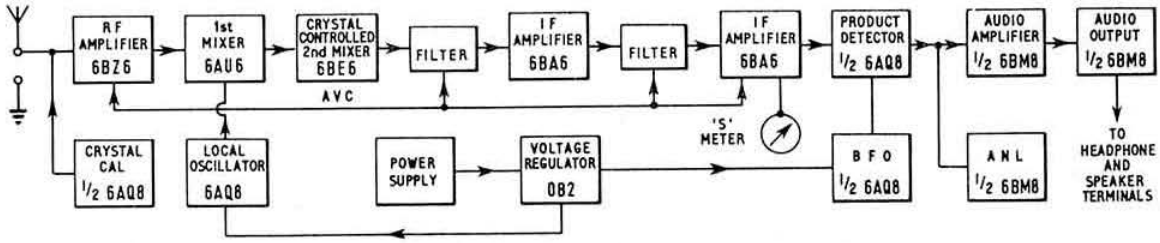


Fig. 1. The block diagram of the HA-500 receiver. The power supply uses a silicon diode rectifier.

The ceramic filters are placed between the second mixer and the first i.f. stage and between the first and second i.f. stages. The filters are mounted on a small printed circuit board mounted on the main chassis and this can be seen in Fig. 2. The a.g.c. and a.m. rectifiers are crystal diodes and the audio amplifier and output stages are contained within the single envelope of a 6BM8. Half wave rectification is employed with a resistance capacity filter using an effective capacity total of 100 μF.

Mechanical Construction

The wiring is of good standard and the open construction (again similar to the Drake and the Sommerkamp receivers) renders all components and valve bases accessible. The case is in two sections and can be removed without trouble. It is of substantial metal and movement of the receiver did not cause any frequency variation. The case is attractively finished in a grey crackle and there is an aluminium escutcheon behind the knobs and beneath the tuning dial. Variable controls were of good quality and not of a type from which trouble would be expected after a short period of operation. The dial pointer drive and tuning capacitor mechanism was satisfactory bearing in mind that it is of the cord type. To completely eliminate backlash on a drive of this type is almost impossible. The weight of the receiver is 23 pounds.

Performance

When mention is made of a tunable first oscillator the first question that comes to mind is in connection with frequency drift. The answer is that the receiver does drift during the first ten minutes or so after switch on from cold but after this initial period it is remarkably stable. To test its characteristics it was tuned to zero beat on the ZD7WR beacon station on 28,991 kc/s and it was found that after two hours only a low pitched audio beat note was audible. The sceptical will say that a circuit of this type cannot possibly give such a result but it is stressed that this is not a laboratory measurement but a test in a normal amateur station. Possibly there were compensating factors which produced the surprising result but of its existence there is no doubt.

It has been reported by G3PGK that on the 3·5 and 7 Mc/s bands there is a heat cycling effect causing small changes of frequency, both h.f. and l.f. This was not apparent on the test receiver although this was used during s.s.b. contacts on 3·5 Mc/s. This effect may be due to the proximity of a heat source to the oscillator coils of the two bands or alternatively it could be caused by a defective capacitor in the oscillator circuit.

A second test which sometimes produces quite unexpected results on communications type equipment is to set up a certain frequency and beat note using the crystal calibrator and the b.f.o. and then completely rotate the bandswitch to come back to the original setting. The pitch of the note changed but only 200 to 300 cycles. This was considered to be a satisfactory result from a receiver in the economy class.

In terms of sensitivity the receiver compared well with other commercial units being only slightly inferior to the Drake 2B. The maker's specification quotes a shape factor of 3 : 1 using the ceramic filters and an overmodulated local station on 3·5 Mc/s did not produce any devastating

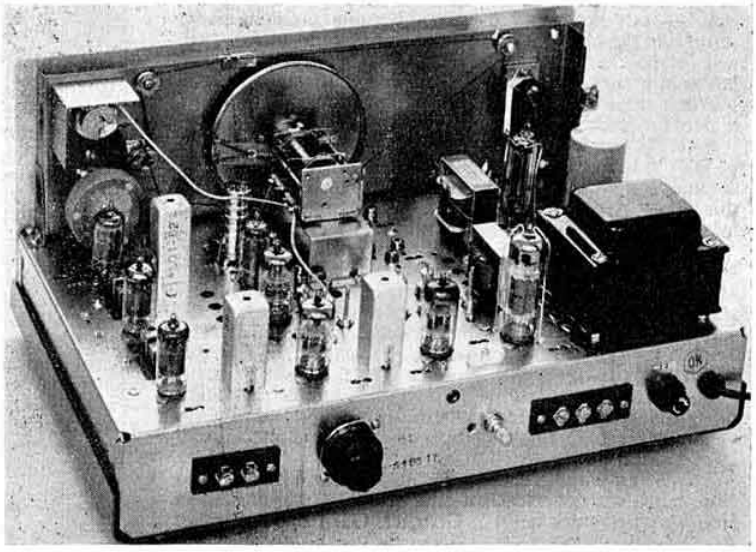


Fig. 3. The rear of the receiver showing (left to right) the aerial/earth terminals, remote control plug/socket, calibrator adjustment, audio output terminals and fuse. The small variable capacitor seen at the left hand of the front panel is a calibration control so that the dial scale may be accurately set up with the use of the crystal calibrator.

effect, although the skirt selectivity was obviously inferior to the receiver using a conventional mechanical filter. Image rejection was adequate provided that one carefully set the aerial trimmer as the frequency sweep of this was capable of reducing the image rejection very considerably.

It will be seen that the receiver covers the US 6m band of 50 to 54 Mc/s, an allocation which we do not have here in Region 1. However, the sensitivity drops off considerably in this range and is probably adequate only for local working. The writer is interested in the reception of US signals on this band during the approaching period of sunspot maximum and therefore has a 50 Mc/s converter available. Suffice to say that the performance of the latter was greatly superior. If conversion to 70 Mc/s is contemplated it is believed that the performance will not justify the work involved and with a wide coverage receiver of this type it could hardly be otherwise. The crystal controlled converter and tunable i.f. approach is likely to give far better results.

Once the b.f.o. control was set up for correct sideband, s.s.b. signals could be tuned in without further adjustment. The a.g.c. circuit made alteration of the r.f. gain control unnecessary except on very strong signals on 3·5 Mc/s. Reception of a.m. signals presented no difficulty but the selectivity is obviously too wide for optimum c.w. working, but if desired this could be improved by an external *Q* multiplier.

The amount of audio output was in excess of that which would be normally required. There was some residual hum when using headphones but this was not objectionable. The cause was not investigated but could well be the dress of wiring in a grid circuit sensitive to hum pick-up. A speaker is not an integral part of this receiver and connections are available on a rear chassis apron. A matching speaker can be purchased as an optional extra.

Manual

A well produced manual contains all the electrical information likely to be needed by the user. The tables of voltage and resistance readings can be invaluable for servicing. The circuit is clearly printed and there are clear markings of all component values. Attached to the receiver in its mint condition is a pictorial label exhorting the purchaser when all else fails to read the manual. Obviously the manufacturers have on their staff a person well aware of the usual approach to new equipment.

The receiver is of Japanese manufacture but the terms of the guarantee will be honoured in the case of the receiver loaned by the Society by the UK dealer concerned.

Opinion

The writer first switched on this receiver with a " stand back and wait for the bang " attitude. However, after some use and investigation he is happy to admit that this was completely unjustified. The price of the equipment is 42 guineas and obviously one does not expect performance of the standard of the latest Racal or Plessey receiver for this money. If you do and are satisfied please propagate the welcome news. It is believed that this receiver is good value for money, particularly for the newcomer to Amateur Radio. It provides acceptable performance at a reasonable cost.

Acknowledgement

The receiver from which the information for this article was obtained was loaned to the Society by G. W. Smith & Co. (Radio) Ltd. of 3 & 34 Lisle Street, London, WC2.

MORE EXHIBITION NEWS

(See also pages 562 and 563)

BARTG at the RSGB Exhibition

The British Amateur Radio Teleprinter Group will be demonstrating typical Amateur Radio RTTY equipment in operation—teleprinters, tape readers, RTTY converters, etc.—as can be found already in many amateur radio stations in the UK. Also available on the stand at only 2/6d, will be the Group's booklet *RTTY—The Easy Way* which has sold a surprising number of copies both at home and overseas since its introduction at last year's Exhibition, and it gives full basic information on how to get going on RTTY.

BARTG was formed in 1959 to foster the growth and use of RTTY by amateurs as a highly-efficient mode of radio communication, and it offers its members many services to this end. Membership of the Group is open to anyone interested in receiving or transmitting RTTY.

BARTG Newsletter is sent out to all members quarterly, with news, technical, and constructional features, and adverts. In addition, the "BARTG RTTY Newsflash" service keeps members advised every month of most of the surplus and new RTTY equipment appearing on the market.

Each year BARTG sponsors the Spring RTTY Contest, which helps to keep the Group in the forefront of international RTTY activity. For certificate hunters, BARTG offers the Quarter Century Award (QCA): awarded to anyone furnishing proof of two-way RTTY contacts with 25 or more countries.

The Group is affiliated to the RSGB, and also keeps in close touch with overseas societies and RTTY groups. The Honorary Secretary is D. J. Goacher, G3LLZ, 51 Norman Road, Swindon, Wilts.

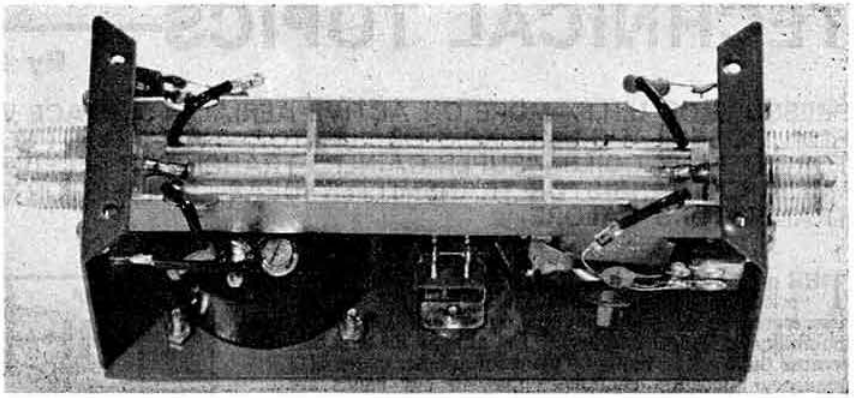
List of Exhibitors

	Stand No.
Amateur Radio Mobile Society	8
Baden-Powell House Scout Amateur Radio Group	11
British Amateur Radio Teleprinter Group	6
British Amateur Television Club	7
Daystrom Limited	18
Electroniques (Prop. STC Ltd.)	16
Enthoven Solders Ltd.	9
General Post Office	28
Imhof Limited	19
International Short Wave League	33
J. Beam Engineering Ltd.	14
KW Electronics Ltd.	15
L.S.T. Components	31
Lowe Electronics	13
Northern Polytechnic	10
Partridge Electronics Ltd.	12
Practical Wireless & *Practical Electronics* (George Newnes Ltd.)	5
The Radar & Electronics Association	10
P. F. Ralfe Radio	23
Radio Shack Ltd.	30
Rank Bush Murphy	30
Royal Air Force	17
Royal Navy	26
Royal Signals	2
Science Research Council Radio & Space Research	Stage
Peter Seymour Limited	25
Short Wave Magazine Ltd.	29
Swanco Products Ltd.	3
T. W. Electronics	20
Wamrac	22
Weller Electric Corporation	32
Wireless World (Iliffe Electrical Publications Ltd.)	4

TEST REPORT

Hansen S.W.R. Bridge

By R. F. STEVENS, G2BVN



The Hansen s.w.r. bridge uses a trough for the pick-up lines, and this is a remarkably accurate piece of engineering when related to the price at which the unit is offered.

THIS compact instrument is an s.w.r. bridge of the type that has been described many times in radio journals [2] during the past five years and of which the *Monimatch* [1] seems to have been the forerunner. It uses channel type construction to house the pick-up leads and the inner conductor of the feeder. Rectified r.f. in either the forward or reverse direction is selected by a switch and this is shown on a sensitive meter. The indicator on the Hansen bridge comprises a meter $1\frac{1}{2}$ in. square and having a full scale deflection of 100 μA. The meter is calibrated to show an s.w.r. of 3:1 at half scale.

The ends of the feeder section are terminated in SO-239 type sockets and the bridge may be left in circuit at all times when the input power does not exceed one kilowatt. The attenuation experienced as a result of placing the bridge in the feeder is negligible on the h.f. bands. The manufacturer does not specify a maximum frequency of operation but above 70 Mc/s the readings may become unreliable. The power necessary for full scale deflection on 3·5 Mc/s was about 25 watts, with correspondingly less power required at higher frequencies.

It should be emphasised that instruments of this type are standing wave *indicators* and not precision devices. There are several factors, any of which may cause inaccurate readings, and these include differences in coupling to the feeder in the two directions, or nonlinearity of the diodes. However within their limitations bridges of this type are extremely valuable tools for the average station and can greatly simplify the adjustment of aerials and aerial tuning units. [3]

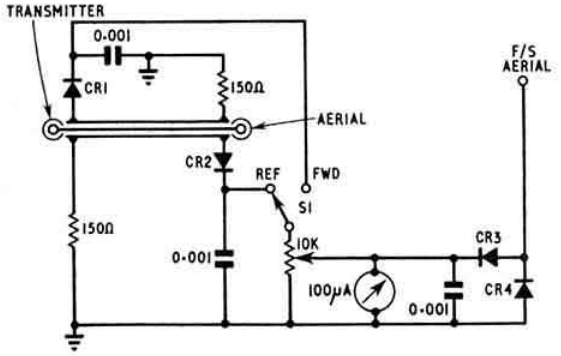
A secondary use of this bridge is as a field strength meter and for this purpose a five section pick-up aerial is supplied. The input circuit is untuned and the sensitivity will obviously be limited.

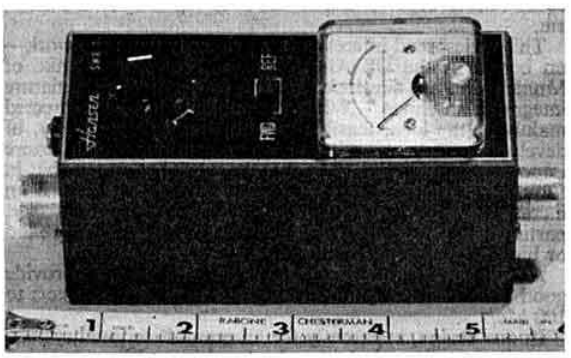
The bridge is housed in a metal case finished in grey crackle and is available in models having either 52 or 75 ohms impedance. In common with many operators, the writer has constructed a variety of s.w.r. bridges but when one considers the modest price of this instrument one is reluctantly forced to the conclusion that having regard to the materials and time involved the effort is no longer justified.

The Hansen S.W.R. Bridge costs 59s. 6d (postage 2s. 6d extra) and is available from G. W. Smith and Son (Radio) Ltd., of 3 and 34 Lisle Street, London, WC2.

References

[1] " The Monimatch", McCoy, *QST*, October 1956.
[2] " Standing Wave Ratio Meters", P. Harris, RSGB BULLETIN, May 1964.
[3] RSGB *Amateur Radio Handbook* (Third edition), page 482.





The s.w.r. bridge circuit diagram, and the appearance of the compact housing.

TECHNICAL TOPICS

By PAT HAWKER, G3VA

PRESSURE ON U.H.F.—MORE ON ACTIVE AERIALS—SURFACE WAVE COMMUNICATION FT241A OSCILLATOR—100 KC/S OSCILLATOR—TWO-DIODE PRODUCT DETECTOR TOROID TANK COILS—"SUPER-GAINER" TRANSISTOR RECEIVER—T5ER'S LONG AGO MULLARD TRANSISTOR TRANSMITTER IDEAS—TRANSISTOR *Q*-MULTIPLIERS TRANSISTORS GALORE

THE price of liberty, it is said, is eternal vigilance. The price of retaining Amateur Radio frequency allocations increasingly depends not only on vigilance but also on the ability to " repel boarders." Let nobody imagine that because there are currently no plans for another major ITU frequency allocation conference that all our bands are secure.

Consider for example the following passage from an article by a well-known and influential advocate of mobile business radio: " One of the most promising possibilities lies in the extension (of the business mobile band), downwards from 450 towards 400 Mc/s. The band 420 to 450 (actually now 427 to 450) Mc/s is at present allocated on a shared basis between amateurs and an obsolete radio altimeter. Part of this band would give very useful relief to the growing pressure on u.h.f. (mobile)." (J. R. Brinkley, *Electronics Weekly*, 26 July).

Radio spectrum space is today a truly precious commodity. The days when amateurs had unlimited right to everything below 200 metres is but a distant dream—nowadays every kilocycle counts. And new techniques are coming along which will make u.h.f. and microwaves much more attractive to commercial users—such as the Gunn diode and other bulk effect devices, and the possibility of cadmium sulphide electron acoustic wave u.h.f. sources (if these ever become cheap, they could make these frequencies even more attractive for amateurs also).

Almost unnoticed at Geneva in 1959, European amateurs lost their prime rights to many u.h.f. and microwave bands, which they now hold only as " secondary " users on a non-interference basis. Vigilance—and action—is certainly going to be needed in the years ahead.

Active Aerials

In the July *TT* we included a section on " active aerials " suggesting that there were useful possibilities in including active devices, such as transistors or tunnel diodes, as part of the aerial structure. In fact this item was rather overtaken by events, and there has been a good deal of speculation in the United States and West Germany that active aerials could render obsolete almost all roof-top television aerials, etc.

This widespread interest arises primarily from the work—on behalf of the US Air Force—of Professor Meinke of Munich who has developed various forms of " subminiature integrated antennae." While the publicity has been directed mainly at the idea, feasible but not immediately likely, of developing these for television reception, much more important would seem to be that the work has shown that in future the " active aerial " concept is likely to become an increasingly powerful tool in the hands of the aerial designer, particularly for miniature receiving aerials of broadband or highly directional characteristics.

A 20 in. model, it is reported, has been shown to provide good broadcast reception throughout the range 500 kc/s to 100 Mc/s.

In one design, apparently for an omni-directional system, a small capacitance hat on a short rod is used in connection with four bent-down ground-plane type elements, with four transistors to amplify the signals and match them to the coaxial feeder. The low-noise transistors thus form an integral part of the aerial, and allow the basic element lengths to be reduced from one-quarter-wavelength to only about one-fiftieth wavelength, making a compact aerial.

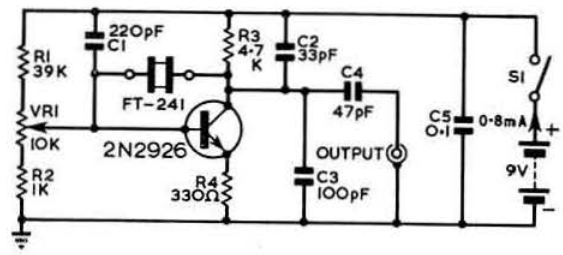


Fig. 1. The G3OGK crystal oscillator circuit for use with FT241 surplus crystals. All resistors can be one-tenth watt.

But directional arrays also seem to have been developed, since it is suggested that an almost immediate application could be as a D/F aerial on about 5 Mc/s, with the ability to rotate the zero pick-up direction through 360 degrees (i.e. as with a unidirectional beam) rather than the 180° of loops. In amateur working one could well imagine that such a system could prove very effective in overcoming QRM from unwanted directions. While a certain amount of technical information has already appeared in various journals, nothing we have seen yet would show an amateur how to set about designing such an array—possibly because of the military implications of this work.

But it is becoming clear that this is a technique to keep an eye on.

Surface Wave Communications

Another intriguing hint of things to come in the radio communications field is provided by some proposals put forward by Professor H. M. Barlow of University College London (see *Electronics Letters*, August and *Electronics Weekly*, 9 August) as to how a 1·5 Mc/s " surface wave " signal could be launched over the surface of the Earth. Although it is now many years since G5CD demonstrated at an RSGB meeting how the surface-wave single-wire transmission line (G-line) could be successfully used on u.h.f., this is still a way-out subject, but is one that could conceivably have amateur applications in the future. Among other things, it might allow highly directional systems to be operated on 1·8 Mc/s over considerable distances since attenuation might be less than 2dB per mile.

The suggestions include an ingenious horn launcher with an aperture of only about 20 ft. on 1·5 Mc/s using a curious ferrite-loaded tapered strip under the horn.

A surface wave is one which propagates along an interface between two different media, largely without radiation; in the G-line the wave travels outside the dielectric coating. In this system, one gathers, the wave would hug the surface of

the Earth rather than radiating upwards—and it would not for instance be possible to pick-up the signals in an aircraft.

It seems very interesting—but please do not ask me to explain how it might work (or whether it will ever work).

Oscillators for Surplus Crystals

Interest remains high in the development of novel circuits for transistor crystal oscillators, despite the number that have already been published.

Gerald Kennedy, G3OGK, provides details of an arrangement (Fig. 1) which he believes to be original allowing FT241A crystals to be used on their fundamental frequencies for b.f.o.s., local oscillators, calibrators or synthesisers without a resonant circuit. He points out that it is generally regarded as rather difficult to obtain reliable results with these particular crystals. The novel feature of his circuit is the capacitative divider phase shift network from the collector of the transistor to the supply lines.

G3OGK has built a considerable number of these oscillators and finds that they all work reliably, first time. He uses a 2N2926 transistor made by General Electric in the States (available from Jermyn Ltd. of Sevenoaks), and the only setting up adjustment is the 10 K ohms potentiometer to give maximum output. The circuit works over the full range of FT241 crystals (340 to 580 kc/s) giving about 1 volt peak-to-peak output with a consumption of about 0·8 mA with a 9 volt supply.

G3OGK mentions that the entire unit can be built conveniently in a tobacco tin.

Yet a further variation providing an oscillator for use with surplus crystals, this time intended for parallel-resonant 100 kc/s DT face shear or 5° X cuts, appears in *Wireless World* (August, 1967) by I. Roberts. Such crystals show considerable variation of activity and required load capacitance, but it is claimed that the circuit of Fig. 2 will allow most crystals to be used. The use of a v.h.f. type transistor should be noted; the amplitude and harmonic content of the output is governed by the pot., and where highest stability is required the gain control should be adjusted to provide lowest amplitude level consistent with reliable starting. In some cases, with minimum gain, full output may not be obtained until about 15 seconds after switch-on. But where the unit is required as crystal calibrator, etc., higher harmonic levels can be used. Where, with maximum gain, these are insufficient the author suggests that a Schmitt trigger circuit should follow the output stage.

Two-diode Product Detector

A circuit which is currently appearing all over the place is the two-diode product detector. For instance, it has been featured recently in *CQ* (March, 1967), *73* (May, 1967) and a couple of times in *Radio-REF*. Most of the circuits show it as a straightforward s.s.b./c.w. product detector, but an extremely simple modification used by F2ER (*Radio-REF*, June, 1967) in a modified BC342N is able, with the sole addition of a switch, to cope also with a.m. envelope detection. This switch is shown by the dotted lines of Fig. 3 and if fitted we would suggest that leads be kept short as otherwise i.f. harmonics could be radiated from the leads.

The *73* version is used by W6BLZ in quite an attractive looking all-band s.s.b./c.w. receiver, which has a basic 3·5 Mc/s tunable receiver (starting straight-off with a 7360 beam deflection mixer) to which a switched crystal-controlled converter (6386 cascode h.f. stage, 6U8 pentode mixer and 6C4 cathode follower) adds the other bands.

In connection with the product detector, W6BLZ warns that germanium diodes should be used as in this application (contrary to many others) a degree of leakage is desirable to prevent charging up and blocking of the diodes: he uses two 1N298s, and mentions 1N295 and 1N67A diodes; F2ER gives OA85. Something like 5 to 12 volts b.f.o. injection is needed, otherwise strong signals may sound distorted.

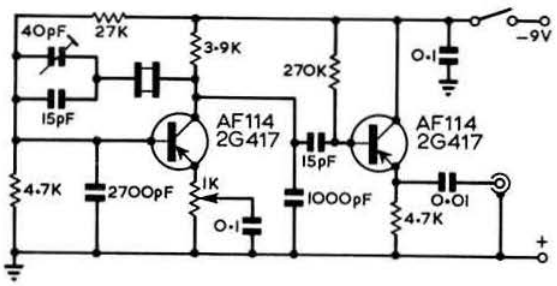


Fig. 2. Oscillator and emitter-follower output stage suggested in *Wireless World* for use with 100 kc/s surplus crystals.

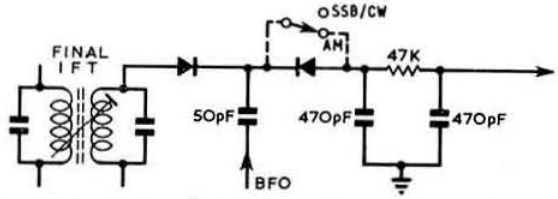


Fig. 3. Two-diode product detector, showing incorporation of switch to provide envelope detection on a.m.

Toroid Tank Coils

Attention has been drawn in the past to the use of coils wound on toroidal formers particularly for tank circuits of transistor transmitters, but a most informative article by W4BRS in *73* (June, 1967) describes fully their use and design for valve p.a. stages of 100, 500 or 1000 watts.

He provides an impressive argument for going over to toroids, despite the fact that a single former may cost in the region of £1. These arise from the fact that the toroid tends to keep the magnetic flux almost entirely within the coil, and thus helps to eliminate the conventional loss of efficiency with coils mounted close to a chassis or iron components, as well as allowing a volumetric size reduction of the order of eight-to-one. This would seem to make them ideal for compact transceivers and other space-conscious equipment, and also should help reduce any stray inductive feedback which might otherwise cause instability.

It is pointed out that the higher Q tends to make tuning rather more critical, especially with unloaded stages, and that precautions are needed to prevent flashover. Care should also be taken during winding, since undue pressure may cause the cores to snap (however they can be repaired with epoxy or household cement since electrical contact is not involved).

W4BRS gives full details for winding a multi-band h.f. tank coil, using Ami-Tron T-200-2 cores. These are sold by Ami-Tron Associates, 12033 Otsego Street, North Hollywood, California, USA at $3 each, with US post charges listed as 25 cents. We imagine similar large ferromagnetic toroids are available here, and would be interested to hear of a source at comparable prices. W4BRS mounts his cores directly on a ceramic band-change wafer switch. In view of the size and other advantages, it might well prove worth considering the use of toroids in almost any modern transmitter: smaller cores for low power stages, including those wound on ferrite beads, are quite inexpensive.

Simple Transistor Receivers

Although there is still a good deal of work to be done on advanced all-transistor receivers for the amateur bands (two

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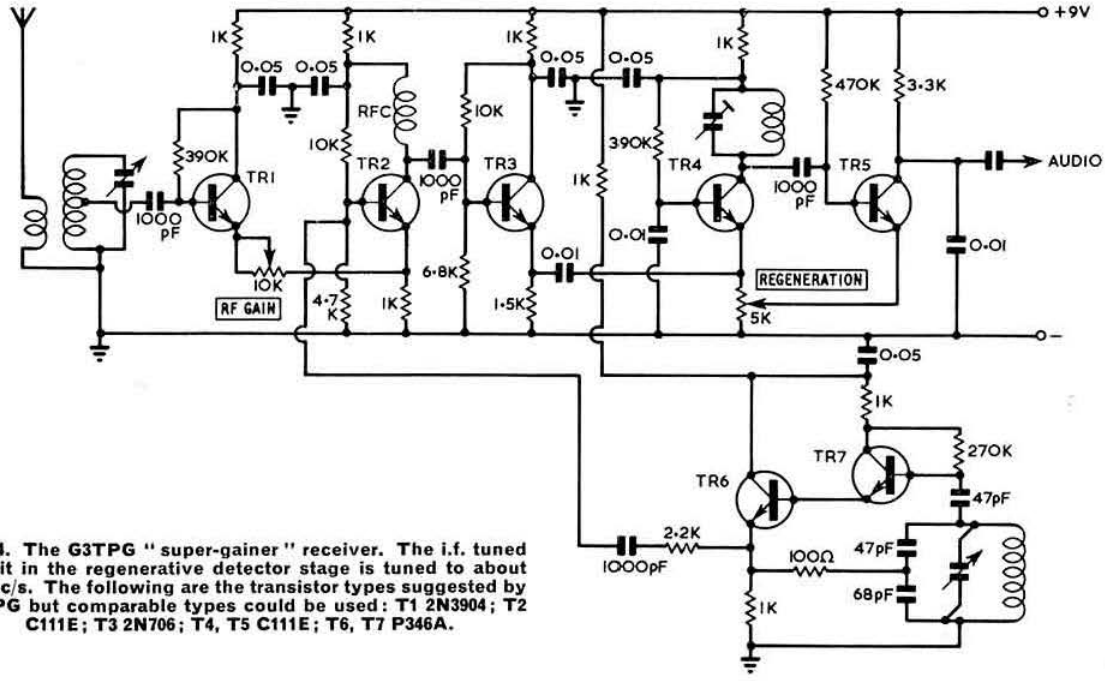


Fig. 4. The G3TPG " super-gainer " receiver. The i.f. tuned circuit in the regenerative detector stage is tuned to about 2·5 Mc/s. The following are the transistor types suggested by G3TPG but comparable types could be used: T1 2N3904; T2 C111E; T3 2N706; T4, T5 C111E; T6, T7 P346A.

useful articles featuring a quite elaborate arrangement including FET front end appeared in *QST* of April and May, 1967), there is still interest in the development of relative simple designs. One approach is the synchrodyne suggested in *TT* (March, 1967). Another very successful little unit, particularly for 1·8 Mc/s, is the low-cost " RSGB Transistor Four " designed by G3HBW. The construction of this simple little set is fully described in the current edition of *The Guide to Amateur Radio*; it has a self-oscillating mixer, regenerative i.f., diode demodulator and two stages of a.f. amplification.

This set can certainly bring in plenty of 1·8 Mc/s and 3·5 Mc/s stations when used with a reasonable aerial, but with its i.f. around 470 kc/s inevitably suffers from image-reception on the higher bands. For those requiring loudspeaker reception on this receiver, we have discovered that if a small broadcast transistor set is stood close to the G3HBW receiver and tuned to a quiet spot, there is plenty of pick-up of the i.f. signal and good speaker reception is possible.

J. R. King, G3TPG, of Southampton has passed along a brief outline of a rather more elegant form of " super-gainer " superhet, using seven *n-p-n* transistors up to the detector stage, though since only a single i.f. tuned circuit on about 2·5 Mc/s is used, construction is simple, and image should be fairly low. I feel a little uneasy that no attempt is made to operate the entire i.f. strip as a selective amplifier, since this could make it rather susceptible to cross-modulation, etc. However there are several interesting features in the circuit (Fig. 4), including the use as local oscillator of a super-alpha pair circuit, basically similar to the one given in *TTftRA* (page 49). G3TPG does not give any coil details, but mentions that the oscillator covers all h.f. bands with the component values shown.

C.W. Monitor

G3TPG also describes a novel form of c.w. monitor (Fig. 5) providing a side-tone when the valve stage is cathode keyed. The Zener diode is used to protect the *n-p-n* transistor a.f. oscillator whose inductive element is provided by the high-impedance headphones (this form of a.f. oscillator is also discussed in *TTftRA*, page 96). The basic technique could be used equally well with other forms of a.f. oscillator.

The " T5-er " or Heterotone Again

Rather longer ago than one cares to think about, I wrote (BULLETIN, September, 1962) a short article on a c.w. receiving concept and a device I named the T5-er. This was basically an arrangement whereby all c.w. signals could be switched through a small diode/transistor unit to be heavily distorted and so made to produce a whole spectrum of harmonics. I felt then—and still do, even though the device was taken out some time ago, always with the intention of developing a more reproducable circuit—that this is an excellent system for copying c.w. signals. In effect, instead of the single fatigue-producing note, they tend to sound like m.c.w., even when previously passed through a very narrow a.f. filter.

It is possible to produce a comparable note by triggering a local a.f. oscillator, but the T5-er arrangement does not result in any false triggering by interference.

In my innocence, I believed the concept, as well as the actual arrangement, was original. But recently, John Crux, G3JAG, sent along a copy of a most interesting article by W1EYM in *QST* from way back in July, 1936. This 31-year-old article put forward essentially the same arguments although in his case he produced the a.f. distortion by changing a valve output stage to have high negative bias so that it operated in class C. He also incorporated a 250 c/s a.f. filter, pointing out that this low audio frequency was suitable, since the harmonics supplied a full spectra of audio tone in the output: see Fig. 6.

Following up this lead, I thumbed through library copies of *QST* for that year—and sure enough found (November, 1936) a further item on this form of reception; this time by no less an authority than James J. Lamb, then technical editor of *QST*. He recounted efforts, dating back to 1929,

to turn incoming c.w. signals into m.c.w. Although this had not proved successful with straight receivers, he had developed an arrangement for screen modulating the signal as it passed through an i.f. stage of a superhet: and he termed this " heterotone c.w. reception." His system consisted of using an a.f. oscillator to screen modulate the i.f. stage.

He wrote that " the most striking effect of the change in the character of the signal is the apparent increase in loudness." This he considered was partly due to the real signal power being increased by the addition of the sidebands, but mainly because of the change in the character of the signal.

It is most interesting to discover that the advantages of m.c.w. reception of c.w. signals were being advocated not only five years ago—but also 30 years ago. Perhaps in another few decades it will become established!

More seriously, it often seems much more difficult to arouse interest in c.w. than in 'phone topics. Yet it would be a great mistake to regard telegraphy as an inferior form of communication. Among other attributes it has something like a 22dB systems bonus over a.m.—and quite a sizeable bonus even over s.s.b.

This is yet another reminder of the wealth of material which can still be dug out of old issues of amateur and other journals. Radio communication did not begin yesterday; during the late twenties and the thirties a vast number of ingenious ideas were put forward, often well in advance of the means of making them really effective. Only the other day, as another example, I came across (BULLETIN, March, 1938) what may well have been the very first proposal for a mixer-type v.f.o. This was put forward by I. B. Clark, 2BIB, as a letter to the Editor—with the subsequent result that a number of other letters were written—some of them suggesting the whole idea was crazy!

And only a few years later, during the war, a British engineer gave the first-ever description of a frequency-synthesiser at an IEE meeting, which according to the report had an almost hostile reception, largely on the grounds that the term " frequency synthesiser " was most inelegant!

Again, a potentially highly important technique of "synchronous stable relays " for the retransmission on the same frequency is engaging the attention of engineers concerned with mobile and personal u.h.f. radio (including Brian Armstrong, G3EDD). It is freely admitted that much the same idea was put forward many years ago by Dr. J. Robinson of " stenode " fame whose classic crystal filter was later popularized by the same James Lamb of ARRL who has already been mentioned in connection with the " heterotone."

More Transistor Transmitter Tips

The interest of commercial designers in all-transistor transmitters, especially for mobile and aeronautic applications at v.h.f. and u.h.f., continues to grow steadily. Earlier this year a useful symposium on the subject was organized by MCP Electronics (see *TT*, May, 1967), and now more recently this has been followed by a " Practical Planar " symposium on this subject by Mullard Ltd. (see *Electronics Weekly*, 28 June).

This company has also recently issued two most useful publications on this subject: TP900 on " 170 and 80 Mc/s v.h.f. transmitter circuits using the BLY33, BLY35 "; and TP901 on " Experimental f.m. transmitter and receiver circuits for 13·8-volt at 470 Mc/s." Both are issued by Industrial Markets Division, Mullard Ltd., Mullard House, Torrington Place, London, WC1. Even more useful are the Applications Symposium papers under the title " Mullard Practical Planar for Transmitters." We are not sure whether any of these can be obtained on request unless one can show a definite commercial affiliation, but it might be worth trying. *(Continued)*

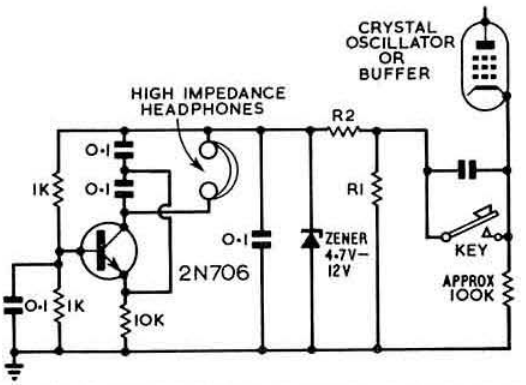


Fig. 5. C.w. monitor suggested by G3TPG. It should be noted that the Zener diode is used as protection against surges that occur when used with a crystal oscillator, rather than for stabilizing the potential for the a.f. oscillator. R1 and R2 will depend on the cathode current and type of Zener diode.

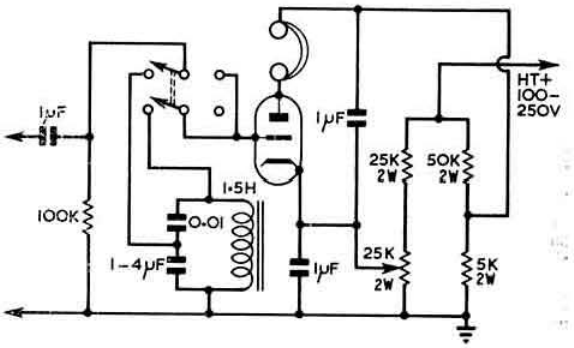


Fig. 6. A technique suggested 30 years ago for T5-er type reception, using a heavily biased valve stage to distort the c.w. signal into m.c.w. The a.f. filter can be switched in or out of operation.

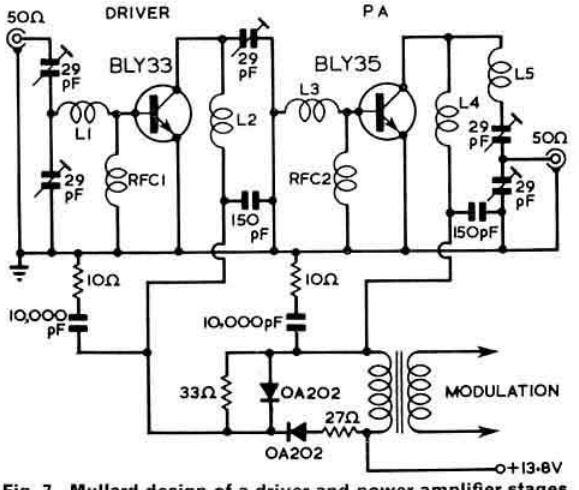


Fig. 7. Mullard design of a driver and power amplifier stages of a 7-watt output, a.m. transmitter for 170 Mc/s for operation from 13·8-volt vehicle power supplies. The two chokes RFC1 and RFC2 are of the " lossy " type described in the text. Note the double by-passing and the use of the two diodes to shape the modulation applied to the driver.

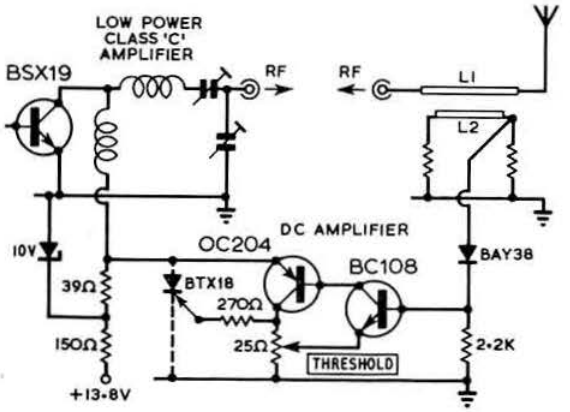


Fig. 8. Outline of the s.w.r. protective circuit proposed by Mullard. This can be set to reduce or cut off the power of the high-power stages when the s.w.r. rises above an adjustable threshold value, with sufficient speed to prevent damage to the high power transistors.

The symposium brought forth a massive amount of information on current and future transmitter design techniques, with the emphasis on the use of class B amplifiers having T matching networks in the input and output circuits basically similar to the Motorola circuit discussed in *TT* (May, 1967, Fig. 4) with a *lossy* r.f. choke between base and emitter line. This choke was shown in the Motorola circuit as having a *Q* of less than one, and we were interested to find in the Mullard notes details of how these can be made: for the 80 and 170 Mc/s units the chokes consist of two turns of 26 s.w.g. enamelled copper wire wound on a ferrite bead type FX1115.

The Motorola circuit showed the use of several parallel by-pass capacitors in the collector line, and the importance of effective by-passing to prevent destructive oscillation has been commented on several times. All the Mullard circuits make use of a slightly different arrangement with a damped (10 ohms in series with an 0·01 μF) by-pass in parallel with the 500 pF feed through capacitor: this is intended to prevent oscillation at either high or low frequency, and was described as preventing the problem of " switch on and the whole thing goes bang."

Another circuit dodge, which we have also noted in some American designs, is the use of diode modulation wave shaping circuits to allow collector modulation to be applied also to the driver stage, but with the modulation to this stage made asymmetrical to maintain low envelope distortion: this is shown in the circuit of Fig. 7.

It has long been clear that current transistors are rather more suitable for f.m. than for a.m. operation, since the high a.m. peaks are avoided; this might be borne in mind for v.h.f. operation along the lines advocated recently for 70 Mc/s working.

Another problem with a.m. operation is the change in transistor parameters with the varying drive and supply potentials, often calling for some careful " off-tuning " of the transmitter circuits from the optimum conditions as set up for c.w.

Among the interesting approaches discussed at the Mullard meeting was an s.w.r. monitoring arrangement designed to provide extremely rapid backing-off of " shut-down " of the p.a. stage in the event of the s.w.r. in the output co-ax lead to the aerial going up. This type of arrangement is being advocated in some cases for higher power base station operation, since r.f. power transistors can easily be destroyed or damaged when the stage is not working into a reasonably matched load. Such a change might occur due to a fault developing in the aerial, or possibly due to a metal ladder touching one of the elements. Even where such a condition might not cause complete transistor failure it could affect its operating life due to over-dissipation. The use of a protective circuit also allows smaller heat sinks to be used.

Fig. 8 shows the outlines of such a device, which can be used with or without the thyristor which allows complete shut-down if the s.w.r. goes beyond a threshold figure of say six. Where a thyristor is not available, it may be worth recalling that one can be simulated by a complementary pair of transistors (see *TT*, January, 1966). This particular technique is in fact being used in a protective circuit in the new all-transistor colour television receiver developed by the British Radio Corporation. These protective circuits play a roughly comparable role to the tunnel diode protected power supply described in the BULLETIN recently by G8ACC.

Yet another Mullard circuit was for an electronic T-R switch for use on 50-ohm coax lines of a 12-watt transmitter to switch the aerial from transmitter to receiver in place of a mechanical relay. This uses two BB105 variable voltage capacitance diodes and a BAY38 silicon diode for receiver protection. In this particular circuit, the bias conditions for the BB105 diodes is changed by switching bias potentials. But we have seen described in an *IEEE Transactions* an alternative approach to this problem, using four-layer

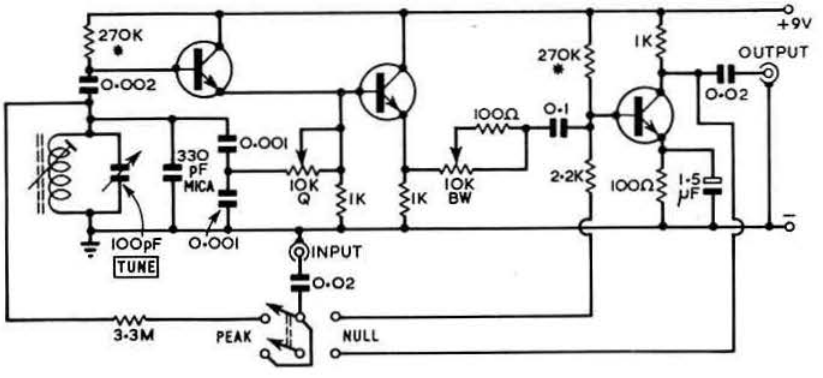


Fig. 9. Transistorized *Q*-multiplier circuit from *Radio Electronics* providing both peak and null facilities. The tuned circuit must tune across the receiver's i.f. Transistors 2N388, 2N1304 etc. 10 K linear potentiometers (Q and bandwidth controls).

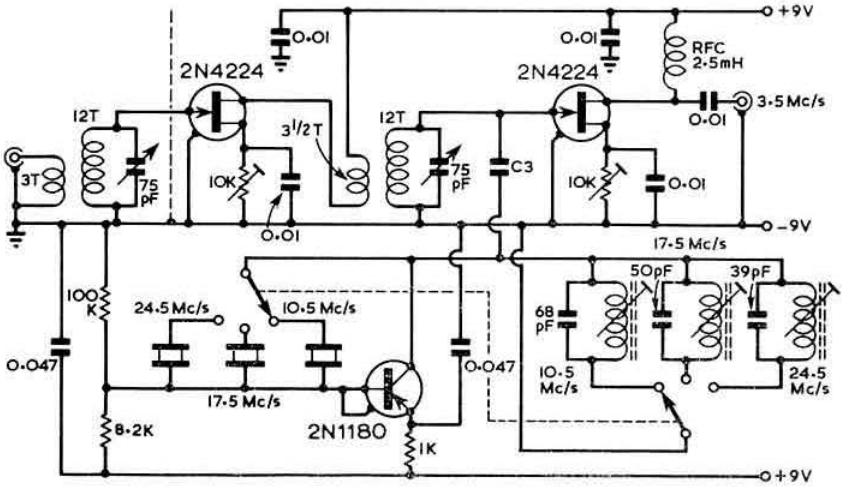


Fig. 10. The K6DQB FET converter for 28, 21 and 14 Mc/s. C3 capacitor for injecting the oscillator to the gate is formed by twisting together two 1-in. lengths of insulated hook-up wire. Alternatively injection can be to the source if low impedance coupling coils are used on the crystal resonant circuits. The original model uses Motorola 2N4224 FETs but the cheaper MPF105s or the Texas Instruments units could probably be substituted directly. Overall gain of the converter will be less than with the usual valve converter but noise figure should be low enough to provide reception of weak signals.

diodes (2N3512) to form an entirely r.f. activated aerial switch.

Transistor Q-multiplier

Although there has been a number of transistorized *Q*-multiplier circuits published, many of them provide either peak or null facilities only. However, a switched peak/null arrangement appears in a constructional article in *Radio-Electronics* (August, 1967) which, incidentally, also describes the construction of an updated version of the Select-o-Ject a.f. phasing device, popular a few years back, using four 2N4360 FETs.

The *Q*-multiplier circuit is shown in Fig. 9 and uses three *n-p-n* transistors of which the f_{ab} should be over 5 Mc/s, h_{fe} in excess of 100, E_{ce} over 20 volts, and P_c over 100 mW. The 270 K ohm value given for the two base bias resistors may require adjustment; they should be selected to drop about one half the supply voltage to the respective bases.

The unit can be inserted between the i.f.t. and the grid of a valve i.f. amplifier in a valve receiver, possibly requiring modification to the biasing arrangements for the valve stage, since there is no d.c. connection through the unit (input connection to i.f.t., output to grid). A novel idea in the original article is the suggestion that two such units can conveniently be built into a small well-screened box, and operated in series, allowing two nulls to be obtained simultaneously. The tuned circuit should, of course, be the highest possible *Q*, using either a ferrite pot core or, as in the original, an m.w. ferrite aerial coil.

Power can often be taken from the cathode bias resistor of an output stage in a valve receiver.

Transistors by the Pound

Some of the prices at which it is possible to pick-up surplus and even new transistors seem to be becoming so low that the whole concept of circuit design is bound to change, with active devices as cheap as capacitors. This same trend is bound to occur with integrated circuit (SIC) design, since very large numbers of transistors can be fitted on to a silicon slice without incurring much of a cost penalty. In the States some firms are now offering transistors by the pound weight—and even SICs are beginning to appear in the bargain lists (though one wonders how one can identify what is inside a job lot). One firm has been offering 50 assorted SICs for $5.95.

Meanwhile plenty of articles are appearing using SICs and those other "with it" devices, the JUGFETs (junction FETs) and IGFETs (insulated gate FETs). Particularly popular at the moment are simple FET h.f. crystal-controlled h.f. converters, a typical example being the 14, 21 and 28 Mc/s unit by K6DQB (*73*, May, 1967): Fig. 10.

Since preparing this *TT*, a most interesting letter has come in from C. F. Dorey (BRS16468) of Yeovil putting forward an experimental h.f. front-end design using two FETs based on his belief that these devices are better used in the common-gate configuration, rather than common-source as in the K6DQB unit: this circuit will be considered next time.

But a combination of FETs and SICs is still a novelty, though what may be a significant pointer to the way things are going has already been announced. For in the recent *73* list (April) of h.f. s.s.b. equipment appears a Babcock B-500-SSB transceiver for 3·5 to 30 Mc/s which apart from the 12BY7A driver and 4CX250B p.a. is all semiconductor: including some 13 SICs and a receiver front-end consisting of two FETs in cascode, followed by an FET mixer. The unit has two independent v.f.o.s, runs at 600 watts p.e.p. on s.s.b. with built-in mains and 12-volt battery power packs. The 4CX250B operates in AB1 mode on s.s.b. but class C on c.w. and a.m. (the a.m. modulator is an optional plug-in unit). Clearly not a cheap unit (no price is given) but it all sounds quite a rig!

Simple Aerials

With so much emphasis these days on beams, it is worth stressing that, particularly on c.w., plenty of pleasant if not spectacular contacts can be achieved still almost on a wet string. We recently made an analysis of some 14 Mc/s contacts with European stations at G3VA and it was interesting to note the aerials being used: 24 per cent of stations who gave an aerial were using ground planes; 20 per cent dipoles; 18 per cent the "G5RV"; 14 per cent "long wires"; only 10 per cent had beams of any type, and the remainder were accounted for by Windoms, "VS1AA" and "W3DZZ." And this seems to be a fairly typical selection, particularly of the aerials in use by East European stations.

G3KPO has sent along some detailed information supplied by F5PI on his "Maria-Maluca" multi-band beam which has been mentioned several times in *TT*. There is rather too much information to include in this issue, but if anyone is struggling with one of these we will try and let them have a photo-copy of the drawings.

The Stability of Transistor Variable Frequency Oscillators

By A. D. MacDONALD, B.Sc., Assoc.I.E.E.*

TRANSISTORIZED v.f.o.s are still generally considered to be less stable than valved ones, and considering some designs, there is justification in this belief. However, transistors can perform well, and it is the purpose of this article to decide how to go about achieving the highest possible stability without introducing too many complications.

There are three causes of instability: (1) Supply variations, (2) Temperature effects, and (3) Loading effects.

Supply Fluctuations

A change in the supply voltage to a transistorized oscillator results in a change in the base to collector capacitance, which affects the total capacitance across the tuned circuit, and so the frequency alters. As this change of capacitance can easily be 0·5 pF for a voltage change of 9 to 8 volts, the effect of it makes it practically essential to use a stabilized supply, and a Zener diode stabiliser is usually sufficient.

Temperature

Temperature effects are many and varied. First consider the transistor. An increase in temperature increases the gain, reduces the base to emitter voltage drop, and results in a greater current flow.

This in turn alters the parameters of the transistor, and once more appears as a change of capacity across the tuned circuit. The cure? If the stability of the operating point is improved, the frequency stability will likewise improve, and this necessitates the use of low resistance bias potential dividers, and possibly a compensating diode, as shown in Fig. 1. The diode should have the same voltage drop as the transistor base to emitter voltage. The effect of temperature on a germanium transistor is incidentally, likely to be less than silicon in a good design.

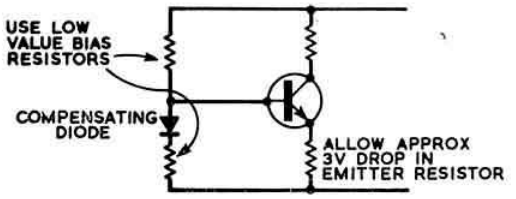


Fig. 1. Use of a diode to compensate for variations in ambient temperature.

What about the tuned circuit components themselves?

Considering coil formers first, the temperature coefficient of all plastics is large, and thermoplastics like polystyrene are particularly high. Bakelite is better, and will probably be favoured owing to its availability. However, ceramic formers are vastly superior and it is worth seeking the smaller types.

The list of temperature coefficients includes pyrex for a good reason. As it is so stable, it makes an excellent coil former, and is available in the form of a pyrex test tube, easily cut to the right length.

Whatever former used, it is important that the coil is wound tightly on it, for otherwise sudden small movements can occur. Actually all sorts of problems arise, because the wire has a different coefficient of expansion from the former, but if a strong glue is used, and the wire is thin, the former should be the controlling factor.

Table 1

Coefficients of Expansion

Polystyrene	80 p.p.m.
Bakelite	25 p.p.m.
Glass	9 p.p.m.
Ceramic	3 p.p.m.
Pyrex	1 p.p.m.

Do not use wave- or pile-wound coils, which are not likely to be stable, and mount the coil well clear of any metal, as the metal can easily move with temperature. Finally, under no circumstances should magnetic core materials be used.

For a well constructed coil, the temperature coefficient of the inductor should be about the same as the coefficient of expansion of the former material.

Next we attend to the capacitors. Normally the variable part of the total capacitance is small, so the temperature coefficient is not too important, but make sure that the capacitor has bearings at both the front and the back, so that its capacity will not vary with the pressure of the hand on the tuning knob.

For the fixed capacitors, mica is usually the most stable, polystyrene has a negative coefficient, and ceramic can be obtained with a wide range of coefficients.

Table 2

Temperature Coefficients of Capacitors

mica	+ 35 p.p.m.
polystyrene	−130 p.p.m.
ceramic	+100 to − 750 p.p.m.

The choice is not easy to make. Certainly most of the capacity should be mica, with some negative coefficient added to balance, but ceramic capacitors are sometimes prone to humidity troubles, and polystyrene capacitors are readily available though in fewer values. On balance, ceramic capacitors of—750 p.p.m. coefficient are probably the best to use for compensation, but only a few per cent of the total capacity should be of this type. The old idea of fixed value, variable coefficient capacitors was very useful under these circumstances, but such components are not so easily come by now.

One more point which affects stability is the by-pass or d.c. blocking capacitor usually associated with the oscillator coil. This is effectively in series with the tuning capacitors, as in Fig. 2.

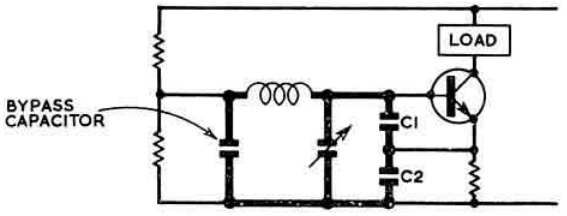


Fig. 2. A typical transistor oscillator with the bypass capacitor discussed in the text.

* 33 Hampton Road, Great Baddow, Chelmsford, Essex.

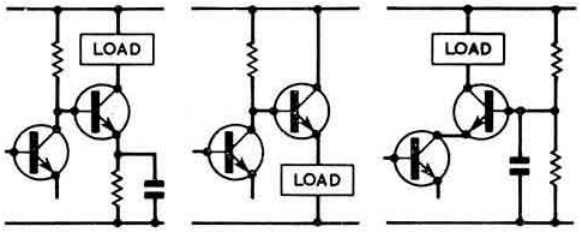


Fig. 3. Transistor configurations considered for isolation of the tuned circuit from the output connection.

The types of capacitor usually used in these by-pass positions have a high temperature coefficient, maybe 1000 p.p.m., so in a quite typical circuit where the tuning capacitances add up to 2000 pF, the by-pass capacitor is 0·1μF, or 2 per cent of the total. Thus this capacitor adds 20 p.p.m. to the coefficient, and the choice should be restricted to a low-coefficient type, or a much larger value, for instance 1μF. If 20 p.p.m. sounds small, remember that for a 10°C change, a 14 Mc/s signal changes by 2·8 kc/s.

Influence of the Output Load

So much for components, what about varying load? Because of the internal feedback from collector to base, changes in the load caused by tuning or keying later stages will result in an apparent change in the oscillator tuning capacitance, producing frequency shift.

The easiest way of reducing loading effects is to operate the oscillator at a sub-harmonic of the desired frequency, as much of the feedback will then be at the wrong frequency to have much effect. Even better is to have two oscillators and mix their outputs to get the required frequency, as the feedback is then not even harmonically related. However, a small degree of frequency shift can still occur.

As the feedback appears as a change of impedance, the resistive part is relatively unimportant to the tuned circuit, but the reactive part is the main concern. By making the capacitors C1 and C2 in Fig. 2 large, they tend to swamp the changes fed back to the base. The only other thing to do is to use a circuit configuration which allows very little feedback. The three possible configurations are shown in Fig. 3.

Fig. 3(a) is considered by many to be poor, as common emitter stages are known to have poor isolation. However, because of mismatch, this gives a very much better performance than is often anticipated.

In Fig. 3(b), alterations in the load are directly reflected by the emitter follower, so the configuration should not be used. Remember that the input impedance of an emitter follower is β times the load.

It is becoming fashionable to use transistor cascodes, which are reputed to have extremely good isolation, and it is not usually fully realized that the cascode is much better than only a single transistor. But the cascode uses two transistors, and so comparison should only be made with other two-transistor configurations, when it can be seen that the common emitter pair is similar in isolation to the cascode. The conclusion? Use it as long as it is not an emitter follower. Remember, though, that a transistor pair will still have an effective feedback capacity of say 0·02pF, which does not compare favourably with a single pentode valve.

Final Precautions

The vital requirement of the output circuit is that it does not allow the output transistor to saturate. Saturation means that the transistor acts as a short circuit, losing its isolating properties. To present a low impedance to the collector, use a tapped coil, or a transformer with tuned secondary, or a parallel tuned circuit of enormous C/L ratio. To achieve the fairly large percentage bandwidth usually required, the load is arranged to reduce the Q to a sufficiently low value: wide-band couplers are more trouble than they are worth.

Example: Allow 75 ohms collector load. Frequency 1·8 to 2·0 Mc/s. Load presented by next stage: 100 ohms.

Use $Q = 8$ for response about 2db down at edges.

$Q = \omega CR \quad R = 100 \quad \therefore C = 6800$ pF, so a foot or two of co-ax makes no difference.

Turns ratio $= \sqrt{\frac{75}{100}} = 1:1{\cdot}15$. Use a primary of 17 turns, and a secondary of 20 turns on a $\frac{1}{4}$ in. diam. former, with a ferrite core.

Finally, we will consider feedback due to strays and common coupling. If the oscillator components are grouped close together, there is less chance of magnetic feedback, and of course they should all be in a thick aluminium box. It must be thick, not for screening (silver paper would do), but for stability resulting from the rigidity.

Power supply leads should be run close together, so that pick up on one is the same as the pick up on the other. Twin screened lead would be excellent, with feedthrough capacitors and r.f. chokes for supplying the oscillator box. The stabilizer circuit should also be in the oscillator box.

That concludes this short survey of oscillator stability problems, and suggests that a circuit as in Fig. 4 is the best answer, coupled with a careful (or lucky) layout.

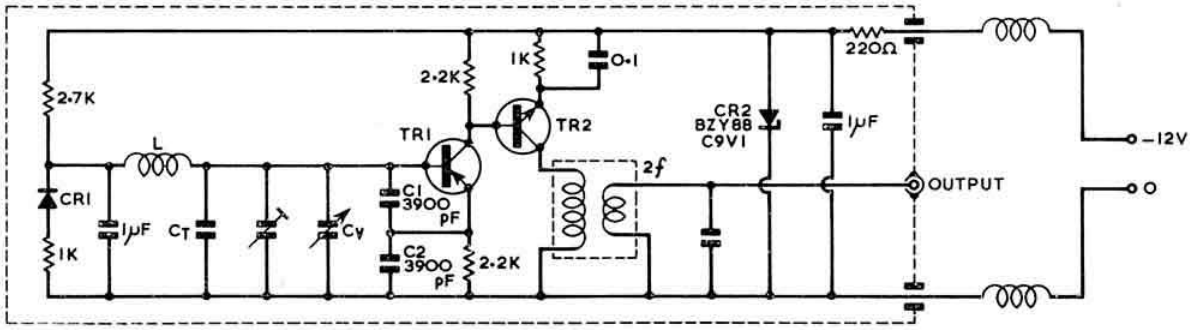


Fig. 4. A practical two-transistor oscillator. TR1 can be an OC171, in which case TR2 is a 2N706 and CR1 is an OA47; but if TR1 is a 2N706, TR2 is an OC170 and CR1 is a 1N914. Using the latter configuration, the polarities of CR1, CR2 and the supply should be reversed. The OC171 and OA47 are manufactured by Mullard, while the 2N706 and 1N914 are produced by Texas Instruments. C1 and C2 should be mica capacitors, and CT is an N750 ceramic, 150 pF with a bakelite former or 75 pF with a pyrex former. C1 and C2 have been chosen so that oscillation only just occurs, but if desired, they can be halved in value, together with CT, which will improve reliability of starting. A suitable arrangement for the output circuit can be evolved from details provided in the text.

THE MONTH ON THE AIR

By JOHN ALLAWAY G3FKM

NEARLY every correspondence column in Amateur Radio magazines contains some reference to that universal Aunt Sally, the QSL Manager. Most of the correspondents appear to be against rather than for and it seems to the writer that a few facts gleaned from a letter from WA2RAU, who in a moment of indiscretion consented to act as QSL manager for the recent VK2AVA/Lord Howe expedition, might be of interest to those who think that the task is a financially rewarding one! Apparently the total sum of money received with the first 3000 applications for QSLs was 66 dollars—an average of just over 2 cents per QSL. Many applicants were too mean to even enclose an addressed envelope, and WA2RAU finished his thankless task showing a loss of over 100 dollars. Just how mean some of our fraternity are is illustrated by the instance of one individual who sent a 10c coin with a note which read: " Enclosed is 10c, 8c for the postage and 2c for your pay as QSL Manager, that's all I believe QSL Managers are worth." What is very clear is that in a good many instances there would be no QSL cards at all sent out by some of the rarer stations unless some kind person went out of his way to arrange for QSLs to be printed (often at his own expense) and to undertake the not inconsiderable chore of filling them in and distributing them. It should be remembered that the services of a free QSL bureau for outgoing cards is not available in many countries, including the United States, and that cards have therefore to be mailed at considerable expense. Surely it is not too much to extend the courtesy of an addressed envelope and return postage when taking advantage of someone else's generosity?

In order to celebrate the 50th Anniversary of Finnish independence all Finnish club stations may use the prefix OF instead of OH for the 50 day period commencing 18 October. There are about 50 active club stations eligible to use the OF prefix, and those who do will QSL with a special card via the bureau. The activity will end at 22.00 on 6 December.

News from Overseas

Latest news of happenings in the South Pacific area is given in a letter received from VK4SS. Al says that Barry, VK9ZCT, who is on Cocos Keeling Is. confirms that the station signing " ZC2T " is a pirate. VK9ZCT also says that he will be very active on 6m during the coming months, and although this will not cause any pile-ups in the UK some good DX should be available to him. The operator on Willis Island, VK4HG, told Al that *all* QSLs should be sent via the VK3 Bureau, but rumour has it that VK2AVA is also handling cards (this seems to be rather unlikely to your scribe as Arie has hardly ever QSLd his own contacts, and used a QSL manager for his recent Lord Howe expedition). ZL1AI (Kermadec Is.) is now back home in New Zealand, his QSL manager still being K6UJW (see April *QTH Corner*). A new station is due to come on the air from Cook Island with the call-sign ZK1CI, and will be active on all bands 80 to 10m, mostly on c.w. This is ZL1AWT and he expects to be in Rarotonga for three years.

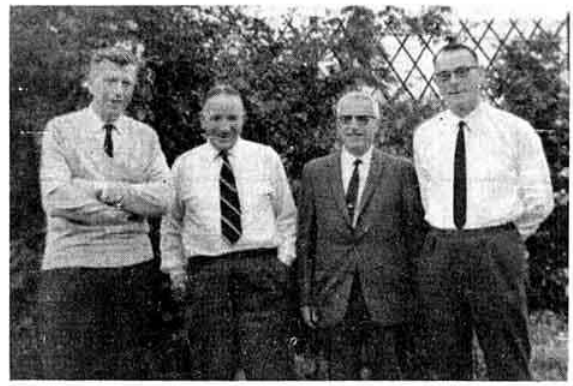
Howard Benjamin, G3MNB, ex-5H3IW, is now in Kenya and has recently been issued with the call-sign 5Z4IW. He is on the air most evenings on 20m s.s.b. with his home-built transceiver and 200 watt linear. Howard's aerial is a quad, and he is hoping to construct a converter so that he can make use of the excellent openings expected on 15 and 10m.

In a letter to G2BVN dated 13 July AP2AD stated that according to information which he had just received AP licences would be reissued soon as there seemed to be agreement in principle with the authorities over the matter. The only legally authorized AP station at present is the one at Boy Scout HQ in Karachi (AP2NMK). It seems that special permission was granted for the setting up of AP2NMK for a Jamboree some months ago and that this permission has now been regularized. Ahmed confirms that all other AP calls he has seen mentioned in various bulletins recently either belonged to persons outside Pakistan or were pirates. His own s.s.b. exciter and receiver are ready for use and he has a linear in the pipe line so should be ready for the day when permission is received to resume activities. (A cable received on 7 August said that Ahmed had in fact received his licence.)

Ron, G3IHP, who is better known to many as VS4RS/9M8RS, will shortly be on the air from Jamaica. He was hoping that he might obtain the call 6Y5RS, but according to G3FKM's *Call Book* this one has already been issued. His new address will be: R. L. Skelton, c/o Jamaica Telephone Co. Ltd., PO Box 21, Kingston, Jamaica.

A letter from Ray Hoare, VK9RH, Norfolk Is., gives the information that he is using a home built transmitter containing a Japanese mechanical filter and using four 807s in the final stage. His aerial is a 3-element Yagi beam, and receiver an AR77. His one complaint is that being a rare station it is impossible for him to carry on any kind of lengthy conversation with a friend without being interrupted by other callers!

As will be seen in *QTH Corner* 9M2DQ will be in England in August starting a spell of three months leave. He would



PA0PN and W2DED, together with G4FN and G2HKU (right to left) during a recent visit to to G2HKU's station. PA0PN is well known for his 160m exploits.

(Photo by G2HKU)

* 10 Knightlow Road, Birmingham 17. Please send contributions to arrive by 6 September for the October issue, 11 October for November and 15 November for December.

very much like to meet old friends from the South East Asia Net or any other amateurs from VS1, VS2, VS4, VS5, VS6, VU, ZC2, ZC3, 4S7, 9M2, 9M4 or 9V1 who would be interested in meeting him for a reunion at the RSGB Exhibition or in establishing a net on 40 or 80m. Interested parties should communicate with Jim at the address given in *QTH Corner*.

It is understood that the QSL manager given for 9U5DP in July *QTH Corner* applies to contacts with W/K stations only. Other stations should QSL direct.

According to TU2BQ there are now 53 TU licences issued, but only five are presently active. TU2s AY, BA, BC, and BQ, are on s.s.b., and TU2AE on a.m only. 9L1GQ has now moved to Freetown from where he is now on the air with his TA33 beam and KW2000. A short note from G3TIF (ex ZB2AR) says that all QSLs for his ZB2AR/MM operation have now been sent out. A 100 per cent QSL policy has been adopted, and Bill is waiting to see what kind of returns he obtains with a certain amount of interest.

Top Band News

A short bulletin from W1BB says that G3RXH, using his 100 ft. vertical, managed to contact both W1BB/1 and W1DEO at about 03.00 on 30 July. He also heard W2RAA. Other items mentioned are the fact that Brazilian amateurs are now permitted to use 160m between 1800 and 1850 kc/s with 1 kW input! At the other extreme contacts between OL4AFI, and G3PLQ, PA0PN and other Europeans at the time that the OL was running 100 mW to a transistorized transmitter are also reported.

As will be seen elsewhere in *MOTA*, there will soon be 160m activity from VQ9JW, Aldabra Is., which should be of interest to the keen DX types. Unfortunately the writer finds that almost all news of outstanding DX achievements by British stations reaches him second hand via W1BB or other overseas sources. It would indeed be appreciated if UK stations would let G3FKM have details of their exploits.

Lichfield ARS hope that they will be using the call-sign GW3WAS/P from Montgomeryshire during the weekend September 16/17. They will have s.s.b. as well as c.w. and welcome skeds which may be arranged through G3KDB, P. A. Miles, 28 Scotch Orchard, Lichfield, Staffs.

G3LHZ is expecting to be /P with his KW2000 from the island of Mingulay in the Outer Hebrides between 7 and 20 September. This appears to count as Inverness for the county hunters. Mike offers to make skeds, but it is not known whether it will be too late to contact him via his home address (" Munzil," Whitehall Drive, Ifield, Crawley, Sussex) by the time this reaches readers. In any case he will spend odd hours on the band.

Contests

The 28th YLRL Anniversary Party will take place between 17.00 18 October and 23.00 19 October (c.w. section) and the same times on 1-2 November for the phone section. This is an entirely YL affair and interested parties are advised to write to Marte Wessel, PO Box 756, Liberal, Kansas, 67901, USA for full rules.

A reminder that the **1967 VK/ZL/Oceania DX Contest** takes place on the weekends of 7-8 October and 14-15 October. Full details are given on page 311, May BULLETIN.

The " **Columbus Contest** " organized by the IIC (Genoa) will run from 00.00 7 October to 24.00 8 October. All bands 3·5 to 28 Mc/s and all modes will be used, and stations may only be contacted once during the contest. Exchanges should consist of report and participant's IARU Region number, one point is awarded for contacts within one's own region, two points for those with other regions and five for QSOs with I, IT, IS, 9A, M1, HV and the Italian Islands. Contacts with I0IIC are worth 15 points, and those between stations in the same country are not valid. A multiplier of DXCC countries worked is used. Logs should be sent to: Istituto Internazionale delle Comunicazioni, Cristoforo Colombo International Contest, Genova, Italy, accompanied by a declaration of all rules having been obeyed, before 31 January, 1968. Anyone contacting I0IIC plus ten other Italian stations will be awarded the IIC Diploma.

During a recent trip to Japan, 160m DXer W1BB visited the JA3 District 160m Boaster's meeting in Kyoto. Seen with W1BB (lower left) is his wife Alice, W1DQF.
(Photo by W1BB)

The 9th Scandinavian Activity Contest will be held between 15.00 16 September and 18.00 17 September (c.w. section), and the same times 23-24 September for the phone section. It will cover 3·5 to 28 Mc/s, and non-Scandinavians should try to work as many Scandinavian stations as possible. A station may be worked once on each band, and for the purposes of the contest LA, JW, JX, OH, OH0, OX, OY, OZ and SL/SM will count as Scandinavia. Numbers consisting of report plus serial number of QSO (starting from 01 or 001) should be exchanged. Each QSO counts 1 point, and each of the previously mentioned nine prefixes worked per band counts as a multiplier. Logs should show date, GMT, station worked, number sent, number received, band, and a note of each new multiplier. A summary sheet showing totals for each band (only multi-band entries are eligible), total claimed points, and the entrant's call-sign, name and address, plus signature and a statement that all rules have been obeyed and that the Contest Committee's decision will be accepted as final, should be included and all should be sent to SRAL, PO Box 10306, Helsinki 10, Finland, no later than 15 October. A few leaflets giving fuller details of this event are available from G3FKM.

1967 IARC Convention

The 1967 IARC Convention is being held in Geneva over the weekend of 22-24 September. A number of well known amateurs will be in attendance, amongst those mentioned as potential speakers are Bill Orr (W6SAI) well known for his *Antenna Handbook*, and Bill Eitel (W6UF) of Eimac. There will be special activity from 4U1ITU, a banquet, excursions to nearby places of interest, and technical panels and discussions. Interested amateurs are advised to contact the International Amateur Radio Club, PO Box 6, CH-1211 Geneva 20, Switzerland. The fee for registration for the convention is 20 Sw. Fr. and the charge for the banquet 35 Sw. Fr.

Awards

Attention is drawn to the " **Down Under Award** " which is a large coloured certificate issued by VK4SS to anyone who has QSL confirmation of having worked 50 VK stations.

The contacts must have been on at least three bands, and five different call areas covered. In addition QSLs confirming at least five other Oceania countries must be held. A list of QSLs certified by two radio club members, plus five IRCs should be sent to VK4SS, 35 Whynot Street, West End, Brisbane, Queensland, Australia. The certificate is issued free to sightless and handicapped amateurs.

One of the most attractive certificates seen by your scribe is the " **USA-CA** " certificate awarded by *CQ* Magazine for confirmed contacts with a minimum of 500 different US counties. There are higher classes of the award, the highest being for those who have all 3079 counties confirmed. This is such a complicated award that *CQ* print special 108 page books which contain lists and maps of counties, and which may be used for filling in when applying for the award. They are available from 14 Vanderventer Avenue, Port Washington, LI NY 11050 USA price $1.25 each; it is suggested that two are obtained, one for application and one for record purposes. The many " QSO Parties " held at weekends and reported in the " Contests " section of *MOTA* are ideal opportunities to obtain credits for the USA-CA award. A similar certificate issued by K6BX (Box 385, Bonita, Calif, USA) called the US County Hunter's Award (US-CHA) is given for a basic 300 counties confirmed—these must cover at least 30 states, seven call districts, and two different ITU zones. Application blanks for this sheepskin are included in the *Directory of Certificates and Awards* (see last month's *MOTA*), or may be obtained from K6BX for two IRCs per set, plus postage. At least two sets are needed.

DXpeditions

Don Miller, W9WNV, and Bill Rindone, WA6SBO were in London during the period 15 to 26 July when they departed for Germany en-route for the Indian Ocean area. No definite plans were announced but a trip to some of the more exotic VQ8 areas including Rodriguez Is. is fairly certain to materialize. During their stay in the UK Bill and Don gave two DX slide shows and talks—one in Birmingham and one in London. These were most interesting and entertaining and it is the writer's opinion that these two avid DX'ers are at present doing a very fine job of festering international goodwill by personal contact with the amateurs of the countries they are visiting.

After seven weeks in Portugese Guinea Iris and Lloyd Colvin of " Yasme " fame were still unable to obtain permission to operate using a CR3 call. They therefore left for Sierra Leone and at the time of writing were operating 9L1KG. Lloyd is interested in activating other countries in the African area and has been heard to say that Iris and he will stay in Africa until the end of the year.

It is rumoured that PY1TX will visit Trindade Is. (PY0) during the first week in September. He should use the call-sign PY0TX and frequencies quoted are 14,110, 21,300 and 28,600 kc/s.

Joe Steele, G3KZI, will be on the air from the Bahamas between 22 August and 9 September. He will be using an SBE 34 transceiver, and will be found around 14,150, 14,250, and 21,395 kc/s. QSLs should be sent to the address in *QTH Corner*.

A letter from the Royal Signals Amateur Radio Society says that RSARS member G3UDU was due to arrive on Aldabra Is. on 13 August and would be on the air from there with the call-sign VQ9JW. He has a KW2000A, a trap vertical, assorted dipoles, and several weather balloons from which he hopes to be able to fly a 650 ft. vertical wire. John will be active on all bands c.w. and s.s.b. during his six month stay on the island and hopes to average six hours operating per day. QSLs will be handled by G3ONU who says that as there is no fixed mail service to the islands it may be several months before cards are forthcoming. Requests for direct confirmation should include IRCs. One possible frequency quoted is 14,025, calls being taken on 14,030. No other frequencies have been given. Requests for skeds, especially on the l.f. bands, are welcome and should be made via the RSARS HQ station G4RS at Blandford Camp. It is proposed to try 1·8 Mc/s–1825 kc/s listening on 1830 kc/s on odd dates, and 3525 kc/s (listening 3530 kc/s) on even dates, in each case between 23.00 and 03.00.

DI2LE, who it may be remembered operated from St. Peter and Paul Rocks a few years ago (according to LABRE without permission), is now in the Indian Ocean in his yacht the " World Cat " and is reported to have been worked from the Cocos Keeling Is. It is thought that he may operate from some of the VQ8 islands but no details on call-signs are available. He has schedules with ZL1ALY, his QSL Manager, at 04.00 and 05.00 on Saturdays and Sundays on 14,195 kc/s. He is believed to be on the lookout for European stations at 11.30 daily around 14,165 kc/s.

There is a report that VK8AV and VK8DI are planning an expedition to Portugese Timor, CR8, probably sometime in mid-October. QSLs will be looked after by K9JJR, and it is hoped to operate on s.s.b. and c.w.

DX Briefs

Results of a recent poll conducted amongst DX'ers by the Long Island DX Association in which over 1000 amateurs recorded their " most needed countries " show that, as far as US DX'ers are concerned the most sought after QSOs are those with Albania (ZA). Other much needed places, in descending order of votes are Laccadive (VU), Iraq (YI), Navassa (KC4), St. Brandon (VQ8), Malpelo (HK0), Spanish Guinea (EA0), Bouvet (3Y), Clipperton (FO8), Rio de Oro (EA9), and Rodriguez (VQ8). To illustrate what an excellent job certain DXpeditions must have performed a number of places which have only been activated by visitors for a very short spell are to be found well down the list—CE0X (San Felix Is.) is 46th and VS9K (Kamaran) is 42nd!

XW8CAL is the call-sign allocated to the first club station in Laos. According to reports all contacts on 1 August, the first day on the air were to be QSLd with a special card.

K6KA, who recently completed his round the world tour, had a considerable amount of equipment trouble and did not operate as much as he had hoped. All QSLs for his trip should be sent to Box 1, La Canada, Calif., USA.

WB2UKP, who has been acting as QSL Manager for SU1AR for several years has been reported as having received a letter from SU1AR telling him that no more logs will be sent to him and no more QSOs made with the USA, Germany, and other places due to the fact that these countries have caused Egypt's troubles! Lebanese stations are still off the air, but OD5BZ says that they hope to be back on again very soon.

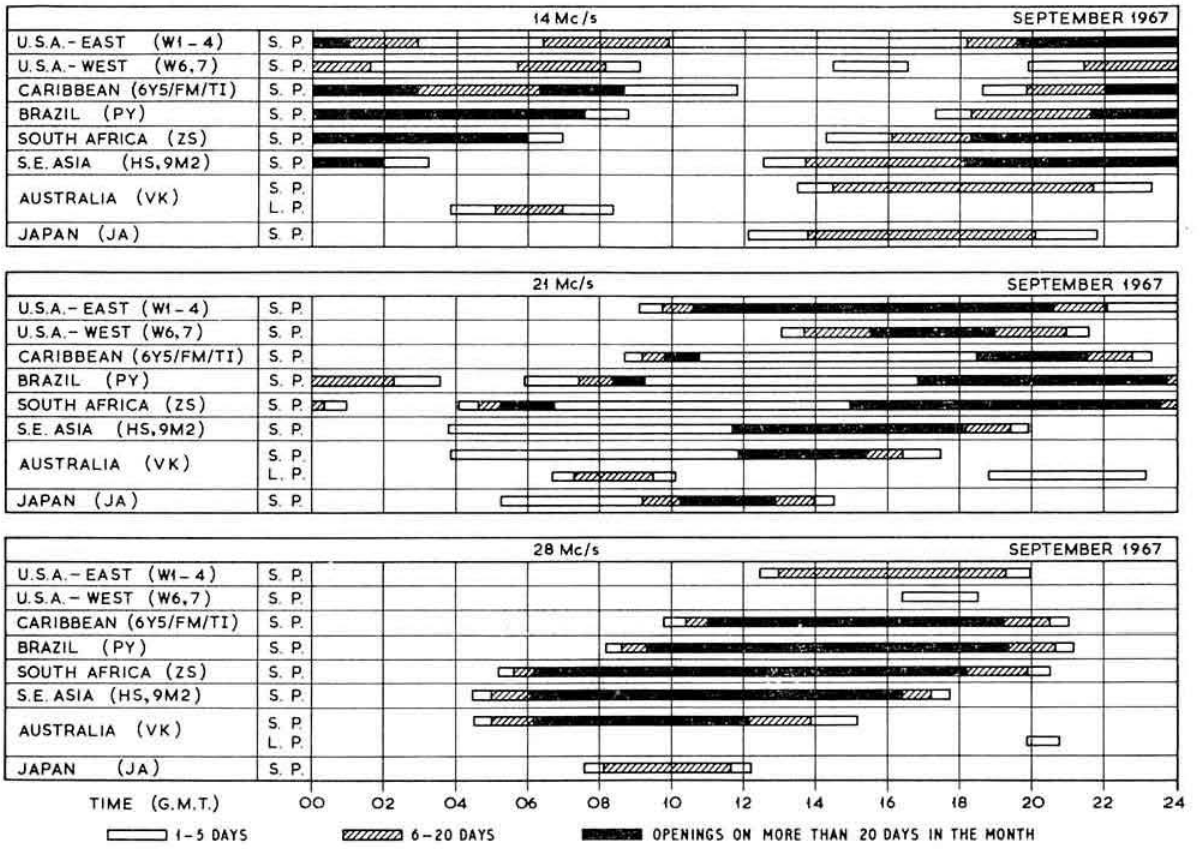
According to 4X4JU the new Israeli prefixes are as follows: 4X6 Gaza Strip and Occupied Egypt, 4X7 former Syrian territory, 4X8 Jerusalem and former Jordanian territory, and 4X9 Sinai Peninsular.

Please note that the QSL Manager for W3DWG for his operations from KS6 and VR6 was incorrectly given as K4YMQ in last month's issue. This should have been given as K4YFQ by the source from which the information was obtained.

Bob, W4QCW, who recently visited the UK has been worked from Rio do Oro whilst operating EA9EJ's transmitter. He seemed to be doing an excellent job of handing out quick contacts, but their validity for DXCC credit would appear to be in some doubt unless he had express permission from the Spanish authorities to operate (see recent ARRL communications concerning W9WNV).

Hermann, TJ1QQ, has now received his s.s.b. equipment and it is understood the trip to Spanish Guinea (EA0AH) should materialize around 12 August.

Propagation Predictions



Whilst the F2 m.u.f.'s are relatively low in the Northern Hemisphere in the period June to August, they begin to increase again in the course of September. For this reason DX conditions on the h.f. bands (28 and 21 Mc/s) will improve steadily during the month. On 28 Mc/s on favourable days (i.e. with F2 m.u.f.'s above average) the East Coast of North America and Japan should once more be heard after a long break. The West Coast of North America, however, will only be heard under exceptional conditions, for which the latter half of the month should be more favourable. In general, contacts on the h.f. bands with North America and East Asia will be easier from Southern Europe than from stations further north. This difference will become more marked in the winter months. In contrast to the summer months Central and South America as well as South East Asia and Australia should be heard with certainty. Contacts with these regions will improve markedly towards month's end. The improvement in conditions on 21 Mc/s over the previous month is not as much as on 28 Mc/s and is mainly limited to contacts with North America, Japan and Australia. With the coming of Spring in the Southern hemisphere the periods for traffic with Australia and South Africa will increase. In September the season for short skip contacts via sporadic-*E* reflection usually comes to an end. As the nights become longer in the Northern hemisphere, traffic with North America on 14 Mc/s will experience worsening conditions in the latter half of the night. On the other hand because darkness falls earlier there will be more opportunity for DX before midnight. On 7 Mc/s during daytime local contacts will be possible over greater distances. With the approach of winter the DX opportunities on this band improve when the major portion of the transmission path lies in darkness and if the QRM permits. On 3·5 Mc/s too, the daytime transmission distances will increase slowly. Interruption of local traffic by the dead zone will only occur in the latter half of the night under disturbed conditions.

The provisional sunspot number for July 1967 was 87·8 with the period of greatest activity lying between the 25th and the end of the month. The predicted smoothed sunspot numbers for November, December and January 1968 are 96, 98 and 100 respectively.

On 28 July, Headquarters received a visit from VK7TR and his wife, who have been touring Europe and should be in the USA as you read this. This couple were among those very unfortunates to have been burnt out during the fire which swept Tasmania during February, leaving only their clothes and car; they are faced with the problems of starting a completely new home on their return. VK7TR asked us to make a special mention of the amazing hospitality they have received, from his arrival in Genoa on 2 June followed by what amounted to a conducted tour to Britain, and especially in Southport, Lancs., where they were welcomed by the 73 S.S.B. Society and put up by G3LSF, who even took them on trips as far as Scotland. VK7TR was also then given the opportunity of using his newly acquired call G3WLF.

Band Reports

Summer conditions and the above average summer weather have combined to make this section a rather sparce one this time. However a number of stalwarts have taken the time and trouble to listen a little and send in reports—many thanks to all who kindly did so. They include the following: G2BOZ, G2HKU G2LB, GW3AX, GM3CSM, G3HCT, G3HDA, G3JFL, G3KSH, G3LHZ, G3SML, G3TBK, G3URX, G4MJ, G8DI, G8JM, BRS27358,

QTH CORNER

BV2A	PO Box 101, Taipeh, Taiwan.
EP2KW	via DL3NS, Klaus Dubac, Kanstr, 15, 694 Weinheim/Bergstr., Germany.
FO8BV	BP 924, Papeete, Tahiti.
FP8BH	**(Aug. 4/6 only).** via W1PFA, 366 Main St, Salem, NH, USA.
I9RB	via DOTM, W2GHK, Box 7388, Newark, NJ 07107, USA.
IT0ARI	IT1JR, Rosario Guarnieri, Via G. da Verrazzano 25, Palermo, Sicily.
W3DWG/KS6	(see W3DWG/VR6).
OX4AA	via K8REG, 4329 Renwood Drive, Dayton 29, Ohio, USA.
PJ3CC	**(Aug. 9/17 only).** W3AYD, PO Box 731, Rockville, Md, 20851, USA.
PX1EQ	via DJ8EQ, Fichtenweg 5, 7022 Leinfelden/Wuertt, Germany.
PX1OE	via W2OEH, 35 Hillcrest Rd, Cedar Grove, NJ, USA.
PX1PA	Artur Peleija, Avinguda Meritscell, Edifici Reig, Andorra-La-Vella, Andorra.
PY0TX	via LABRE, PO Box 2353, Rio de Janeiro, Brazil.
VK9DJ } **VK9FH** }	via Arkansas DX Assn., Box 3323, Little Rock, Ark., 72207, USA.
VP7EA	G3KZI, 12 Broadwalk, London E18.
VP8IE	**(New QSL Mgr.)** via, W3DJZ, RFD 1 -Box 331, New Cumberland, Pa, 17070, USA.
VP8JC	via RCU, PO Box 37, Montivideo, Uruguay.
VQ8CB/VQ8CBR etc.	(All operations by WA6SBO/W9WNV) via Mrs Rindone, 2466 Homesite Dr., San Diego, Calif., 92115, USA.' **Not** as in August *MOTA*).
VQ9B	Box 191, Mahe, Seychelles.
VQ9JW	via G3ONU, 67 Harcourt Rd, Bushey, Herts.
W3DWG/VR6	via **K4YFQ**, 6309 Linneal Beach Dr., Orlando, Fla., USA.
ZD7DI	Box 8, St. Helena.
ZD8HAL	via K0ETY, 1285 W. Main St., Jefferson City, Mo., USA.
5W1AS	PO Box 498, Apia, W. Samoa.
5Z4IW	PO Box 992, Nakuru, Kenya.
8R1G	Hyaline Greaves, 66 Fairhurst, South Mackenzie, Guyana. (or via WA4UOE).
9A1DFD	via I1DFD, Vicenza, SETAF, APO New York 09221, USA.
9L1KG	via YASME, PO Box 2025, Castro Valley, Calif., 94546, USA.
9M2DQ	G3KPY, J. C. Pershouse, "Trees", 50 Brattle Wood, Sevenoaks, Kent.

RSGB QSL Bureau: G2MI, Bromley, Kent.

BRS28198, A5105, A5126, A5182, A5224, A5273, and A5459.

As reported elsewhere **160m** has been producing some Transatlantic signals even at this time in the seasonal/sunspot cycle. Otherwise OL4AER, OL1AHU, PA0CDV, and other European signals have been heard around 21.00 and later. The only report of **80m** activity mentions GC3SRP being heard at good signal strength although only running 2 watts input. Forty metres seems to be performing remarkably well still and amongst the more interesting stations reported are CN8AW, CR6s, JA7MA, OX3BX, PY1-8, VK2AVA, VP8FL, VS9MB, ZB2s, ZD8RB, ZS1XR, 7Q7LA and 9M2DW. All these were on between 20.30 and 21.30. A later DX signal was CX7BW at 23.14. Readers may be interested to know that GW3AX, who provides most of the information on 40m activities uses a 2-element inverted V beam and also a vertical on the band. He uses a Drake 2B receiver plus *Q* multiplier.

As usual **20m** has provided reliable communication with at least some part of the world throughout the whole 24 hours. Signals from the Pacific area have been quite good in the 16.00–18.00 period on a number of occasions, and a number of FO8s (BT, BU, BV, etc.), are often found at quite good signal strength around 14,105 kc/s at 07.00. Other Pacific s.s.b. signals heard were KC6BY (18.00), KH6GHI (07.45), KW6EJ (16.20), KX6DR (17.49), VK4HG (Willis Is. 07.07), and VK9BS (Papua, 21.32). An interesting KL7 was WA1ARF/KL7 (08.55) on Fletchers Ice Island (79′ N, 176′ W, also known as " T-3 ") which is constantly on the move! Other interesting s.s.b. stations heard were CR4BB (15.38), EA9EJ (18.00—20.00 etc. with W4QCW operating), MP4MAY (14.20), PX1OE (10.22), TR8AG (21.06), VS9MB (18.22), ZD9BI (18.37), XE1EEI (04.30, QSLd G8DI together with a miniature silk Mexican flag), 4U1ITU (W9WNV operating, 12.55), and 9Y4PL (04.53). On c.w. CT3AS (19.10), VU2LWZ (23.20), ZD9BI (18.30) and ZLs (around 07.00) have been reported.

The **15m** band has continued to be erratic, some mornings producing loud signals from the Pacific, and on others producing nothing. West coast W/VE stations have also been worked around 07.00. An award for the most frustrating station on the band could easily be won by CE0AE who is frequently a very loud signal but unfortunately spends the majority of his time running phone patches. Sideband enthusiasts have been rewarded by CE8DB (21.00), CE0AE (07.30), G6ZY/CN (Tangier, 18.00), FW8RC (07.15), HK0AI (San Andres. 14.40), HS1CB (19.30, QSL via PO Box 2008, Bangkok), KA6YV (18.00), KL7s (07.15–09.00), KS6CK (08.13), TY5ATD (07.43), VKs (L.P. 22.00), VK9VN (11.30), VQ9BC (18.35, heard to say he does not QSL), VS6AJ/FS (14.15), K7WSG (World Scout Jamboree station, being operated by G3WGI, 18.30), XW8BJ (14.30), 5W1AS (07.40), 5H3JR (20.17), 7P8AR (formerly ZS8L—new prefix for Lesotho, 12.20), 9L1KG (19.53), 9V1LK (16.35), Those who prefer c.w. found CR5CA (22.28), FW8RC (08.30–10.00), KH6FRI/GDO (06.35), TA2CL (15.50), 3C8BB (06.45), VK9XI (Christmas Is. 14.30), VP8JD (S. Orkneys. 16.46), VR2DK (06.43, 10.45), VS6FX (11.20) and 4S7NG (07.55).

Ten metres has been very poor indeed according to all reports received. Apart from Europeans the only DX signals noted were CE3NR (19.45), VS9MB (18.45), ZD7DI (19.39), ZD8CX (19.38), ZS1JA (17.05), 9G1FF/FL (18.30) and 9J2DT (13.40).

1967 Countries Table

	1·8 Mc/s	3·5 Mc/s	7 Mc/s	14 Mc/s	21 Mc/s	28 Mc/s	Total
G3IAR	10	48	45	138	104	57	402
G3VOK	14	36	6	38	1	7	102
GM3SVK	16	15	35	130	100	24	320
G3KSH	3	22	26	46	42	33	172
G3PQF	2	23	28	24	17	41	135
G8DI	—	24	37	85	75	23	244
G3JVJ	14	10	2	1	2	4	33
G3ING	7	13	21	32	26	26	125
G8VG	1	18	27	45	59	54	204
SM3BYD	—	19	57	—	51	—	127
G3TBK	4	10	20	25	34	3	96
G3VWC	3	5	22	19	24	3	76
9V1LK	1	4	21	85	55	42	208
G3VJG	—	3	11	20	26	71	131
G3OJV	1	1	22	21	16	20	81
G8JM	1	—	12	171	103	46	333
7Q7LZ	—	—	5	80	66	29	116
9J2BC	—	—	2	29	16	43	89
A3942	12	51	55	110	76	63	367
BRS25429	5	53	40	114	77	76	365
A5004	4	54	29	112	41	48	288
A5273	5	48	42	93	71	52	311
A4568	9	40	37	157	128	93	464
BRS28198	1	41	37	131	63	51	324
A4886	8	27	35	218	87	53	428
A4182	3	29	25	69	56	48	230
A5105	1	26	10	106	65	42	250
BRS27806	3	23	40	116	121	103	406
A5135	2	21	18	65	56	22	173
A5126	3	18	14	66	44	10	155
A4038	7	12	15	111	181	102	427
A5153	2	17	12	57	31	8	127
A4552/VK	—	1	2	80	10	2	96

This month's table is in order of 1·8 plus 3·5 Mc/s totals.

Sincere thanks are extended to all contributors, with special thanks and acknowledgements to the following: **The DX'er** (*W6PHF*). **DX News Sheet** (*Geoff Watts*), **The DX'ers Magazine** (*W4BPD*), **The West Gulf DX Bulletin** (*WA5LES*), **Florida DX Report** (*W4BRB*), **CQ DX** (*ARI*), **On The Air** (*ON4AD*), **DX'press** (*PA0FX*), **NARS News** (*5N2ABA*), the **LIDXA. Bulletin** (*WB2EPG*) and **FRA** (*Faroese ARS*).

WORLD AT THEIR FINGERTIPS

The Story of Amateur Radio in the United Kingdom and a History of the Radio Society of Great Britain

By John Clarricoats, O.B.E., G6CL

This book of more than 30 chapters and 300 pages will be available for the first time on the opening day of the RSGB Exhibition, Wednesday, 27 September, 1967.
It will be published in two editions, a paper-back costing 14s., and a de-luxe edition costing 47s., both these prices including postage. During the period up to the opening of the Exhibition orders for this book will be accepted from members at reduced prices of 12s. and 42s. 6d. respectively, these figures including postage and packing.

REGION 10

OFFICIAL REGIONAL MEETING

Opening of meeting 1 p.m.
Business Meeting 2.30 p.m.
Buffet 4.30 p.m.
Lecture 6 p.m.

The meeting will include trade displays, competitions for best home constructed equipment and for the best mobile installations.

The lecture in the evening is entitled "Images" and will be given by Professor C. A. Taylor, Ph.D., D.Sc., F.Inst.P., Professor of Physics, University College, Cardiff.

Saturday 16 September

University College, Park Place, Cardiff

Tickets, price 12s. 6d. each, including buffet, may be obtained from C. H. Parsons, 90 Maesycoed Road, Heath, Cardiff. The last date for receipt of applications for tickets is 11 September.

Scottish Mobile Rally and Region 14 Official Regional Meeting
23—24 September, 1967

CULZEAN CASTLE AYRSHIRE

All bookings and remittances should be sent to

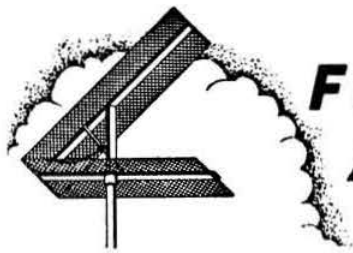
R. Harkess, GM3THI, 55 Woodend Road, Alloway, Ayrshire.

Bookings for lunch, high tea and social must be made firm before 18 September. Hotel or boarding house accommodation can also be arranged if required.

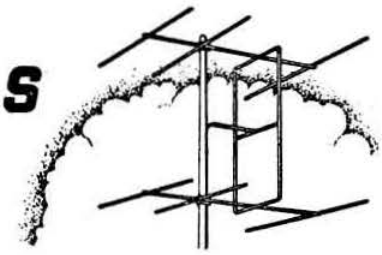
GB3CC: 2m, 4m, 80m

Exhibition of commercial and home built equipment—special exhibition prize—ladies' exhibition—junk sale—special rally prizes—social evening and grand draw—numerous estate amenities including a caravan and tenting site, organized tours of the castle, booklet tours of the estate, a private beach and caves, pony rides for the children, extensive semi-tropical gardens, a swan lake and aviary, children's sports and a variety of sideshows.

Entrance to estate	3/- (adults) 1/6 (children)
Car park	1/-
Morning coffee	1/6
Lunch	8/6 (adults) 5/- (children)
High tea and social	8/6 (adults) 5/- (children)
Exhibition	1/- (adults) children free



FOUR METRES AND DOWN



By JACK HUM, G5UM*

Electronic Signposts

UNUSUALLY, we propose to start off this month not with a résumé of The Biggest Event of the Year (V.H.F./NFD) nor of the latest openings, but with something which is a routine, inseparable, inescapable, indispensable part of the v.h.f. scene, *the beacon service*.

We have said before and we unashamedly say again that the RSGB V.H.F. Beacon Service looked at in terms of value for money provides facilities out of all proportion to the tiny annual outlay expended on it. Most of the beacons use equipment provided either free of charge or at a nominal figure. Site occupancy is arranged on the same basis. Often, the only cost to the Society is the price of the annual licence, plus a small honorarium to each beacon keeper, the unheralded and unsung local amateur who has undertaken to do the necessary maintenance and routine checks and to keep the automatic transmitter permanently in operation come what may (and that means some pretty filthy weather on exposed sites for much of the year).

It is reiterating the obvious to say once again that the beacons can be relied on to furnish signals at any time of the day or night—especially useful when occupancy is low—thus offering facilities for aligning equipment and indicating band conditions. What may be less well known is the fact that they are widely used in many continental countries not only by amateur operators but by certain professional authorities whose investigations of v.h.f. propagation would be rendered a great deal more difficult if the beacons were not there.

In the nature of things, the great and proven value of the 2m beacon chain has prompted many requests from members that similar services should be provided on 4m and 70cm. In spite of the fact that these would serve practical and scientific purposes they cannot be initiated at the drop of a hat. Minimal though the cost might be, it would still have to be related to RSGB expenditure as a whole, bearing in mind that even in this day and age there *are* still a few non-v.h.f. types around to whom v.h.f. beacons mean nothing at all!

But this does not dispose of the requirement for beacons on other bands. The V.H.F. Committee is cognisant of it, and will do all it can to implement it as circumstances and finance dictate.

" AM " and " PRO " Again

Further to amateur-professional relationships referred to above, it is worth putting on record that what is achieved in our amateur v.h.f./u.h.f. allocations does not go unnoticed in what might be called " official " circles. But then it never has. As far as three decades back the pioneer work done by G6DH on v.h.f. propagation pointed the way to subsequent professional developments in this field; and post-war success with forward scatter might have been long delayed but for amateur examples of beyond the fringe working.

And so on and so on. It has been said before and it is true today, *e.g.*, few knew that a reliable 4m path existed between the UK and Gibraltar until the recent amateur links with ZB2 emphasized the fact. As for aurora, our constant preoccupation in this area has usefully added to the fund of knowledge of propagation by its means.

Professional research into separated but parallel techniques draws strength from amateur experience that bisects all of them and provides important interfaces between them.

Three " Seniors "

Three-dimensional proof of successful communication at v.h.f./u.h.f. is the RSGB " Four Metres and Down " certificate. Last month's updated list of holders showed that there are now 13 in the Senior category on 2m and one in the 4m.

A third category is now added: the 432 Mc/s Senior Award. The requirement: proof of contact with nine countries and 40 counties. From the recent continental openings the necessary nine must have been collected by several members by now. The 40 counties will take a little longer. We hope the QSLs won't.

As for the 23cm certificate—three countries and 20 counties needed—it is on the cards (almost literally) that the first award in this category will have been made before the year is out.

Still on the subject of 23cm, but with special reference to its impact on the V.H.F./U.H.F. Listeners' Championship, BRS26234 of Ashington in Sussex writes: " The fact that no listener has returned a satisfactory log for 1296 Mc/s indicates the exceptional difficulties encountered by listeners as distinct from fully licensed operators. Many of the latter have their contacts pre-arranged, but the poor old listeners who are not in the magic circle have to search and hope. The 10× multiplier seems hopelessly inadequate. I would suggest 2× for 70cm and 12× for 23cm, a bigger incentive that would encourage progress and initiative in a most important field."

Bandplan Topicalities

Small as is the amount of sideband to be heard on 70cm at present, be sure it will proliferate as time goes by. Which gives us the opportunity to remind those intending to try s.s.b. on " Seventy " that the sideband calling frequency is 433·41 Mc/s, coinciding with the same spot in the two communication megacycles of 2m.

We might as well add while we are about it that the 70cm bandplan ties in with the 2m one by placing west country stations at the low end, the south in the middle and the north and midland areas at the high end roughly speaking (see current *Callbook*, page 88, for full details).

As on " Two," telegraphy is in the lowest 100 kc/s of the 432-434 Mc/s section; and an important feature to note here is that moonbounce is conducted on 432·000 Mc/s, a frequency to be kept clear except for this specialist operation.

* * *

Is there a case for an s.s.b. calling frequency within the 4m band? From G3BA comes a suggestion that it might be 70·35 Mc/s, clear of existing RAEN and mobile spot frequencies. Views, please.

* Houghton on the Hill, Leicester. Send reports for the **October** issue by **8 September** and for the **November** issue by **13 October**

G3MWZ and his /P station out for the Fourth 144 Mc/s Portable Contest on 2 July.

As for the more general planning of " Four," just a reminder that the six months trial of the G3FDW plan concludes this month. The V.H.F. Committee, anxious to serve the interests of all v.h.f./u.h.f. workers (we must get that in: a chap we know grumped that the Committee " imposes its will," which struck us as the silliest saying of the month), has been reading a bagfull of comments on the subject lately. Some members aver that there has been a swing to the G3OUF plan, others that all plans put up so far suffer from complexity and will therefore be ignored, still others that 4m is too small to plan anyway and will end up with c.w. at the bottom end and phone in the rest. Any comments to the V.H.F. Committee by 15 September please.

We'll have to see.

The Price of Liberty is . . .

We quote without comment from an article in *Electronics Weekly* of 26 July by J. R. Brinkley:

" The main solution to the problem of more frequency space must come . . . ultimately from the reallocation of bands or parts of bands at present allocated to other uses.

" One of the most promising possibilities lies in the extension of the u.h.f. band, downwards from 450 Mc/s towards 400 Mc/s. The band 420 to 450 Mc/s is at present allocated on a shared basis between amateurs and an obsolete radio altimeter. Part of this band would give very useful relief to the growing pressure on u.h.f."

" Four Three Two " Continued

Plenty about 70cm in the foregoing paragraphs. Here's some more:

From the north west Richard Porter, one time G8AHQ and now G3VXK, reports " no complaints about 70cm activity up here in the Liverpool area . . . a few QSOs are audible each evening. Still a dearth of c.w. activity on this band." Perhaps this is to be expected with G8-plus-three men in the majority; they work some fine DX without it! Nevertheless, it is as well to remind users of the band who *do* wield the key to try doing so between 432·005 and 432·1 Mc/s from time to time.

As for sideband on 70cm, the mode is catching on in many areas, and not the least around the G3VXK part of the country. Some spurious products are in evidence, Richard says (we have heard them all too painfully on 2m, let us add!), but he goes on to praise the fine signal from G8ANY of Blackpool, always beyond criticism from the " spurii " point of view. The sideband is derived by mixing an 11 Mc/s exciter with 422 Mc/s.

One comment by G3VXK will be widely endorsed: " I hope that the 70cm beacon GB3GEC will soon return to the air. It is eagerly awaited on Merseyside, being an extremely valuable check on equipment and to some extent on conditions." The men at Hammersmith who are rebuilding GB3GEC (see page 378, June) will be heartened to know that they have a big and active audience awaiting the outcome of their efforts.

Across the country to the north east, Bill Burton of Whitby, G8ANQ, is now persuading 14 watts out of his BAY96 varactor on 433·35 Mc/s. On the receive side he has been " tweaking up the 70cm parametric amplifier (transistorized) and can get 30dB gain over the 2 Mc/s bandwidth. I never cease to be amazed how a paramp brings very weak signals out of the noise." (Let the others into the secret, Bill—J.H.).

There are now so many people in the north east equipped for 432 Mc/s operation, says G8ANQ, that it would be nice to start an activity night in the region. This, to our way of thinking, is a sure method of creating some guaranteed activity and QSOs, and gives rise to the possibility of inter-regional links on the band, as has been suggested here before. Anyway, so far as a north east net night is concerned, those interested who get in touch with G8ANQ will find him to be a real enthusiast on this count. We might add that at least two groups we know of already have Friday as their 70cm activity night. North east too, perhaps?

Now here is another suggestion for the further development of the 70cm band: use the half-megacycle *below* 432 Mc/s as a talk channel for full duplex working. Crossband from 2m and 4m is widely practised, but does not offer the technical challenge of full talk-through on 70cm. Several London area stations are keen on this development, reports G8AXA.

But just a word of warning: some folks do tend to ramble on and on *and* on, with never a call-sign uttered within the statutory period. Everyone knows who's talking, for everyone is immediately recognizable by the voice. Okay—but *please* make it easier for the monitoring stations who listen to us by observing the terms of Paragraph 9 (2) of the Licence.

DX News

Before addressing ourselves to the big news of the month, The Irish Expedition, a word or two about events much farther east.

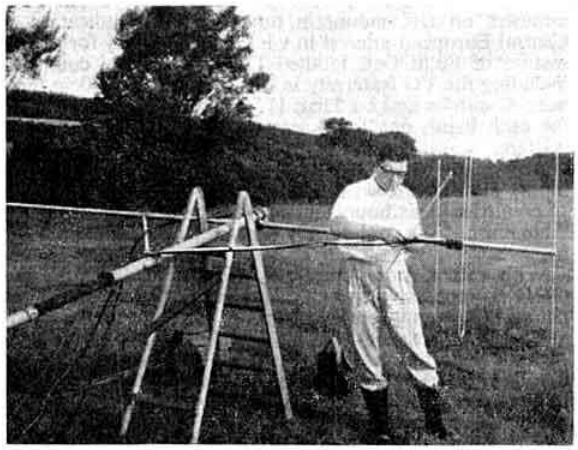
The Eastern European Polni Den field day contest in July gave nineteen UK operators the chance (plenty more tried!) to work on 2m the Czech portables deployed in large numbers on OK mountain tops. It is an indication of Central European interest in v.h.f. that the entry for the 2m section of Polni Den totalled 176 from several countries, including the YO fraternity in fair quantity. On 70cm there were 47 entries and on 23cm 11. There were two categories for each band, one for 5 watt stations, the other for 25-watters.

Among the really QRP men was OK2KNN with 110 mW input. He began to wish he had a little more when he heard 16 countries in six hours and couldn't raise the choicer ones. " He finished the contest very depressed " a compatriot tells us.

With rather more power, 4 watts at a 2600 ft. site, OK1KSO contacted three G stations—just about the outer rim of DX from where *he* looked.

OK1DE, operating from his portable site, tells us that he overheard both sides of a contact between GW3FSP and G8GP but was unable to attract Dewi's attention. Better luck next opening! Tomas goes on to report that " we for the first time applied Region I V.H.F. Committee's recommendation to exclude phone from the 144-144·15 section of the 2m band and it proved very useful . . . it seems the portion is much too small and 144-144·3 or even up to 144·5 would be more adequate. There was a clause in the contest

THE EI2AX/P EXPEDITION—1: The equipment comprised a Nuvistor converter for 2m sideband (top, with speaker alongside), a TW Communicator with a GM0290 preamp for c.w. reception (centre), and a QQV06-40A linear or class C p.a. giving 75 watts of r.f. (lowest deck: the p.s.u. is behind), all in transit case with elastic ropes. The s.s.b. source was a KW2000, part of the installation of the G3BHT VW Caravette used for the expedition. More than 250 AH of batteries were available, boosted overnight with a 300 watt charger.



THE EI2AX/P EXPEDITION—2: The aerial was a J-Beam 10-element Yagi lifted to 18 ft. on each site (G3BHT shown assembling it).

rules forbidding phone operation up to 144·15 and practically all OMs observed that point." Which shows a high degree of c.w.-consciousness by all concerned.

And so to the G3BHT/G3BA expedition to Ireland . . .

The Tour of Ireland on " Two "

First the statistics: EI2AX/P made 812 contacts on the key in the ten days of the expedition with 4½ hours' operating per day, and 150 contacts on s.s.b. in the ten 25-minute periods allocated to this mode. About 90 per cent of the c.w. stations worked were in the 144-144·1 Mc/s segment. The expedition operated from a different EI/GI county each day, sites being chosen (not necessarily the highest) to favour radiation towards the UK.

Another significant statistic from Tom Douglas, G3BA: " Every person who took more than a minute to work us deprived at least two others of a QSO."

On operating technique in general G3BA observes: " The sked keepers were wonderful and were there dead on the minute. They did not panic and waited their turn like well drilled soldiers. We never met any signs of bad manners all through the expedition and we would agree that the success of the trip was due as much to the ability of the UK operators as to anything we did."

Of the sideband sessions it seems from Tom's remarks that there is room for improvement in certain quarters. " Some of the netting was deplorable and the quality of many even worse. It was refreshing to hear a clean signal dead on channel but this was the exception rather than the rule."

The team have praise for the efficiency with which G6CW and G6HV operated the day-to-day 80m talk link with the expedition.

Well, what lessons are to be learned from the EI2AX/P event? The basic one, without question, reiterated here many times, is that the DX on 2m can be worked in almost any circumstances if you know when and where to look on the band and where to point the beam. From these considerations springs a suggestion of such importance as to warrant a separate section on its own . . .

All-Ireland Activity Night

Let Tom Douglas put the suggestion, which is this:

" It is essential to have a well recognized period on a given day when it is known that people will be on the 2m band and on the right frequencies for searching . . . perhaps Friday evenings 22.00 to 23.30 local time."

What now needs to be done is for every EI and GI user of the 2m band *to appear on c.w. within 144·0 and 144·1 Mc/s or on s.s.b. on 145·41 Mc/s every Friday evening from 10 p.m. to 11.30 p.m.*—or if you want it in unambiguous GMT to accord with the licence, between 21.00 and 22.30 GMT.

That is half of the formula. The other half is that every mainland station who can manage to do so shall appear on 2m in the same frequency areas and within the same time periods, beams towards EI/GI.

If A3 contacts promise, then move to the appropriate phone zones—but at all costs keep A3 clear of the c.w. and s.s.b. zones.

An All Ireland Activity Night on " Two " can be the precursor of further developments, such as an All Scotland Activity Night on a different day between the same times. This could well follow Monday Activity Night—but it is entirely up to members to say what they think to be best. And why not 70cm and 4m as well? True, true: but let's get the All Ireland Night on 2m going first on a thoroughly sound and high activity basis (whatever the weather outside!).

See you on the band just after the Home Service News at 10 p.m.!

" MS "

Random attempts at meteor scatter contacts are a waste of time. Prearrangement is essential and so is precise knowledge

of frequencies to be used at each end. Other prerequisites: a really high e.r.p. to achieve maximum reflection, and above all else the patience needed to keep you seated at the operating desk for probably a matter of hours to ensure the essential exchange of reports without which an MS contact is not valid.

For those who cannot actively participate in MS transmission there is much interest to be had in listening to what goes on—but you'll need to be able to read fast Morse.

It may be possible, for instance, to hear such meteor-target shooters as PA6MB on 144·3 Mc/s (half a kilowatt and four 8-element Yagis), or OE5XXL on 144·297 Mc/s (half a kilowatt and a 64-element stack), or even that remote eastern galaxy, UP2ON, UP2OU (both 144·08 Mc/s) and UR2BU (144·17 Mc/s).

We note from the latest VERON *V.H.F. Bulletin* (thanks, G2AIW) that OE5XXL will welcome MS skeds. He can be reached as " OE5XXL, PO Box 240, A4020, Linz, Austria."

It seems to us that BRS and A-members can do a particularly useful job on the MS front by monitoring both ends of meteor scatter contacts and supplying any information which the progress of the QSO suggests may have been missed.

The order of DX to be expected via MS is exemplified by one of the most recent contacts, that between ON4FG and OE6AP, Antwerp to Graz, a straight line distance of 600 miles, but a good deal more via meteor shower.

Getting Together

As promised last time, here is the needful information about the inaugural meeting to consider forming an East Midlands V.H.F./U.H.F. Group: meeting place, Leicester Regional College of Technology; time 7 for 7.30 p.m. And the date, Thursday, 21 September, chosen to avoid clashing with any other known regional activities. The venue is a city centre one in the thoroughfare known as The Newarke, and there is plenty of car parking space in the vicinity. Ask for Room 45 at the College.

Way down south, the next date to remember by the half hundred or more who belong to the South East U.H.F./V.H.F. Group is Friday, 20 October, when Charlie Newton, G2FKZ *the* authority on radio weather, will speak on " Radio Propagation at V.H.F." The venue: Wye College, near Ashford, Kent. If you are not already one of the half hundred but would like to be, the man to contact is G3DAH.

THE EI2AX/P EXPEDITION—3: Hot spot for Tom. G3BA prepares breakfast somewhere in Co. Dublin.

V.H.F./U.H.F. BEACON STATIONS

Call-sign	Location	Nominal Frequency	Emission	Aerial Direction
GB3ANG	Craigowl Hill, Dundee*	145·985 Mc/s	A1	
GB3CTC	Redruth, Cornwall	144·10 Mc/s	A1	North-East
GB3GI	Strabane, N.I.	145·990 Mc/s	A1	N/SE
GB3GW	Swansea	144·250 Mc/s	A1	E.N.E.
GB3GM	Thurso*	145·995 Mc/s	A1	S
GB3GM	Thurso*	70·305 Mc/s	A1	N/S
GB3GM	Thurso*	29·005 Mc/s	A1	N/S
GB3GEC	W. London*	434·00 Mc/s		North
GB3VHF	Wrotham, Kent	144·50 Mc/s	F1	North-West

* Not operational.

RSGB V.H.F. BEACON STATION GB3VHF

The frequency of the Society's v.h.f. beacon transmitter at Wrotham Kent, when measured by the BBC Frequency Checking Station was as follows (nominal frequency 144·50 Mc/s):

Date	Time	Error
12 July	10.50 GMT	170 c/s low
18 July	11.00 GMT	350 c/s low
25 July	21.53 GMT	276 c/s low
3 August	18.50 GMT	41 c/s low

Tech Corner

From G8APX (W. H. Jarvis, Colchester):

Burndept co-axial sockets are easily converted to Belling-Lee pattern with negligible loss as follows:

A " double female " Belling-Lee connector is required. The inner " socket " on one side is squeezed with small pliers, and about 1 in. of copper or brass strip, $\frac{1}{16}$ in. thick, and $\frac{1}{4}$ in. wide, is wrapped tightly round the outside of the same end (" Radionic " kit connecting strip is ideal, although punched for 6BA screws at regular intervals), after removing the existing ring. This end of the connector is now eased into the Burndept socket, establishing a good u.h.f. contact for both inner and outer. (Dust should first be blown out of both components, *not* by wet breath!).

The adaptation is sealed with Araldite or Bostik 7.

Surplus u.h.f. aerial changeover units (Londex) are available, two in a " black box," for 39s. 6d. on the surplus market. They are equipped with Burndept sockets all round and may readily be changed to Belling-Lee by means of the adaptation described above. They require about 20 volts or 20 mA, so they can usually be run in series with the cathode of a suitable stage in the transmitter. They must of course be by-passed for r.f. or a.f. as the case may be.

From G8AKR (Eric Sabin, Shrewsbury):

Further to the use of the DET24 as a 70cm p.a., it is worth noting that GEC specify that a substantial chunk of metal to function as a heat sink should be bolted on to the anode disc of this valve.

Machining the necessary hole with a hand brace and rat tail file is apt to be tedious.

Perhaps the solution is to use laminated construction. Thin plates excavated with a valveholder cutter could be bolted together. How first one lamination may be introduced on to the DET 24, and then the lot, is shown in the accompanying sketch (Fig. 1).

If alternate laminations are made of different sizes cooling fins will be built in. Some war time magnetrons were constructed thus, but welded. If the laminations are reasonably flat to make good thermal contact, the idea seems promising, even though one may perhaps be accused of going about it the hard way!

From G3AHB (Les Coote, Slough, Bucks):

An overtone crystal oscillator circuit that works well with HC-6/Us and gives the required harmonic at the same time

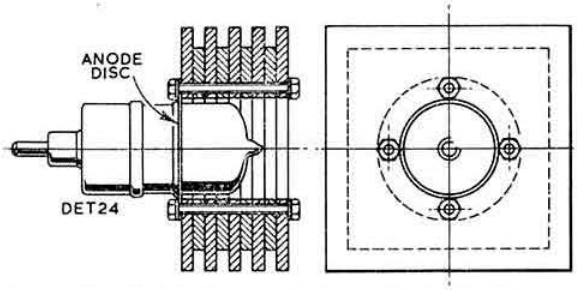


Fig. 1. The G8AKR heat sink for the DET24 used on 70cm.

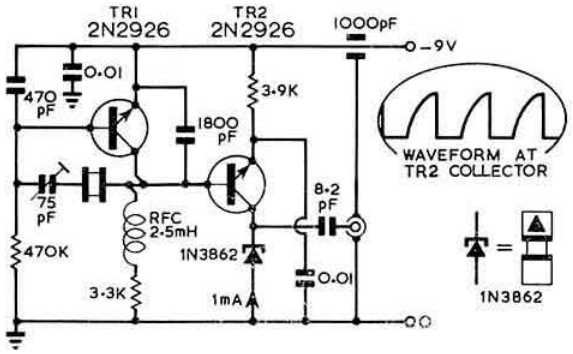


Fig. 2. Pressure on space last month prevented the inclusion of this diagram of the G3SEK band-marker using the 1N3862. For description see page 531 last time.

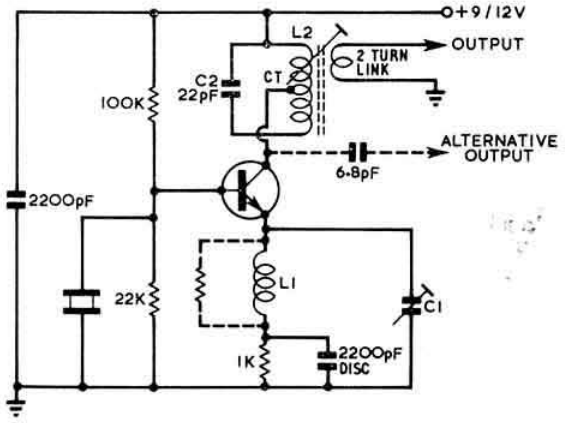


Fig. 3. The transistor overtone crystal oscillator suggested by G3AHB.

is shown at Fig. 3. Several of those I have built enable one to extract the second, third or fourth harmonic of the marked frequency.

The components L1C1 in the emitter circuit are tuned near the fundamental frequency: the inductor should not be of high *Q*. It may be wound on a 15 K type 9 Erie resistor. Its associated capacitor C1 is a 2-10 pF midget variable. The required harmonic is extracted from L2C2 via the link at the cold end of the collector inductor. The transistor can be a 3s. TI Silect of any of the following types: 2N3704, TIS44, 45, 46, 47, 48, 49.

Tuning procedure: with a 35·5 Mc/s crystal tune L1C1 to about 12 Mc/s, and L2C2 to the fourth harmonic, 142 Mc/s, to give an i.f. of 2-4 Mc/s.

Expeditionaries

By the time this appears the excitements of V.H.F./NFD and in particular the opportunities it afforded of working rarish expedition stations will be behind us. But the Channel Islands can still be worked—portable—later this month when the team composed of G3OHH, G3OUF, G3PLX and G3TEY will be in Jersey from 23 to 29 September inclusive. Frequencies will be 70·408 Mc/s and 144·175 Mc/s using one or other of the above call-signs. Schedules will be made only on c.w. but A3 will be tried if conditions warrant.

Write Peter Martinez, G3PLX, " Rose Marie," Victoria Road, North Hayling Island, Hampshire, stating time preferred, own frequency in use and any favoured operating technique.

Apart from skeds, which can be for any time of the day or evening, the team will always call CQ on 4m from 19.00 GMT and on 2m from 20.30 GMT daily.

Beam Director

Those of us who are quite sure we know where every county in the UK is situated and the precise beam heading required to hit it sometimes get a surprise when upon taking a look at a map of these islands we discover anew that places aren't always where they seem to be: that Norwich is farther north than Birmingham, and Edinburgh more west than Liverpool (" Elementary," growls Grundisthorpe).

A large wall-map (16 miles to the inch) now available from Society Headquarters for only 5s. (including postage) helps dispel any such misconceptions. And for county chasers it is just the job, showing UK and Irish Republic counties individually coloured. It can be mounted on a sheet of hardboard hung from a picture rail, and will brighten any radio room. Its dimensions: 39½ by 27½ in. There is a London area enlargement in the top right hand corner, and the new Greater London boroughs are shown.

To make such a map work for you to maximum effect give it a " QRB-stick " which is nothing more than a strip of Perspex graduated in 10 mile or kilometre (or both) intervals, and with one end skewered to the point where your QTH is. Swing the Perspex pointer round on to the station you are hearing and you can measure the distance and bearing in a matter of seconds.

Skeds Operative

By G8AQA, Bristol, with G8ARM, London, on 432·3 Mc/s at 20.30 GMT nightly, looking specially for any London area contacts.

Skeds Wanted

By G8APU, Rayleigh, Essex, operating on 432·37 Mc/s, with any 70cm station at any time in the evening.

By G8APX/A from Malvern during the present week. Listen for him after 21.00 GMT on 433·1 Mc/s.

Here and There

" One hint for mobile men: try the top level of the nearest multi-storey car park. I have had some interesting contacts from the one at Watford, and no one has asked for anything more than the 1s. parking fee "—G8APX/M.

* * *

When signals from Mariner 4 were lost as the satellite went deep into space towards Mars, the Americans commissioned a new 210 ft. parabola and a " super sensitive receiver " and re-established contact at a range of 216 million miles.

* * *

As John Butcher, G3LAS, quits his Berkhamsted home (22 countries, 70 counties on 2m, six plus 40 on 4m and eight

(Continued at foot of next page)

Sunspots

By CERI STONE, G3SGN*

FOR some months, the RSGB News Bulletin, GB2RS, has carried data on sunspots, and the reason for this may have mystified many members. The 11-year sunspot cycle plays a major part in the propagation of radio signals, and the appearance of a large spot on the sun can forecast possible v.h.f. auroral openings and/or disturbed h.f. conditions. It is hoped that the following explanation of the terms used will allow the data to be of greater use to a larger number of listeners.

Details of sunspots are kindly supplied by Cable and Wireless Ltd., who receive the information from the Royal Greenwich Observatory.

Date on Disc. The sun rotates once every 27 days, and since we can see only half of it (known as the " Disc ") any sunspot or group of spots on it will take 13½ days to travel from one edge to the other before disappearing from view. The dates given are those during which the sunspot will be moving across the visible face of the sun.

The first date of notification, however, does depend upon the weather, as even the Royal Observatory cannot see the sun through thick British cloud, and the sunspot may already have begun its journey before being observed.

Central Meridian Passage. When the sun has turned so that the spot is right in the centre, it is then facing directly towards earth instead of at an angle into space. The date and time (in decimals) of the Central Meridian Passage as it is called, is of particular interest since any flare from a spot within an area three days either side of it can have considerable effect on our radio conditions. The more intense the flare, the more conditions will be affected, and the first indication to us that such a flare has taken place will be a Dellinger fade (during daytime only). This is caused by the ultra-violet radiation from the flare, travelling at a speed of light, intensifying the ionization of the *D* layer so that signals are absorbed rather than reflected. Lower frequencies are affected more than higher ones, but of course, a severe flare can result in a complete blackout.

Between 10 and 30 hours later, the particles which were emitted at the same time as the ultra-violet radiation, but which take longer to travel, will reach the ionosphere and result in a magnetic storm, with every possibility of an aurora.

If a spot flares outside the critical zone there may be a Dellinger, but the associated particle stream will be angled into space and should have little or no effect.

Latitude. The first spots of the new 11 year cycle appear in high latitudes, gradually moving towards the sun's equator as the cycle progresses. At present most sunspot groups fall within latitudes 18°-22° N and 18°-22° S.

Large sunspots can be inactive and produce no solar flares, but the result may be improved conditions on the h.f. bands.

Area. The size of the spot is given in millionths of the visible solar hemisphere. To obtain the approximate size in millions of square miles, add ⅛.

i.e., 600 millionths = 700 million square miles.

Sunspot groups are normally notified at 500 millionths or above, but may grow on the disc even after central meridian has been passed.

* 11 Liphook Crescent, Forest Hill, London, SE23.

(Continued from previous page)

plus 34 on 70cm) he asks " Four Metres and Down " to thank all who have given him contacts from there these last four years. " I'm looking forward to trying out the new QTH at Hertford Heath, 300 ft a.s.l. and pretty clear all round," he says.

* * *

" Forty-five minutes' of listening on 2m and six old timers together in the log . . . G6JQ, G6FI, G6LL, G6JP, G6TA and G5TZ "—BRS15744.

* * *

" All EI2AX/P QSLs *asked for* have been sent via the Bureau several weeks ago "—G3BA.

* * *

" Although GB3VHF is usually S2 here in Liverpool the only other signals audible are S2 phone carriers from the SE. Now that we have this marvellous c.w. zone, why don't more people use it? "—G3VXK.

* * *

" The biggest problem at G3NFT/P in N.E. Devon and G3TJW/P in west mid-Devon during the 70 Mc/s Portable Contest in July was getting the medium distance bread and butter points, London, the east coast and the Midlands being poor . . . yet GM and GI were good "—G3LMT (of the Exeter Group).

* * *

" How v.l.f. can a v.h.f.-man get? I have just bought an ex-Navy B41 which goes down to 15 kc/s and am listening on the band 15-35 kc/s, part of the whistler programme for the Society of Amateur Radio Astronomers to determine any correlation between the properties of whistlers and ionospheric activity "—BRS15744 (Ron Ham, Storrington, Sussex).

* * *

" I was very pleased to see you have started a ' television serial.' Please ask TV-receiving members to help keep the series going. I have been using an old modified 1952 Ekco TC196 with an extra i.f. stage added and only a vertical dipole, and the first DX was a test card from Italy "—A4976 (Bernard Wright of Barton on Humber, Lincs).

(*Last month's feature was given a lengthy reference in* Electronics Weekly, *date 9 August.*)

* * *

A final about that contest weekend of 12-14 August. The new 432 Mc/s Open produced high activity and low conditions (you certainly had to dig for the last half dozen). The new s.s.b. event on 14 August evoked some commendable operating and great enthusiasm—except for that rule about " consecutive QSO's". By now the Contests Committee will have a fair consensus of opinion about it.

THE V.H.F. COMMITTEE WOULD LIKE TO HAVE YOUR VIEWS ON THE 4m BAND PLAN BY 15 SEPTEMBER. SEE PAGE 587.

ALL-IRELAND NIGHT. EVERY FRIDAY AT 10 p.m. ON 2m, SIDEBAND AND C.W. BE THERE!

MOBILE COLUMN

Gilwell Park Rally, 9 July, 1967

One of the problems facing organisers of mobile rallies in these times of abundant opportunity is to find a formula which will lift their particular event out of the general run. Obviously, a great deal of thought, time and effort is expended annually throughout the country in trying to tempt hordes of " mobiles " from their Sunday dinners on to the crowded roads of Britain and off to some desirable spot, there to sample the delights laid on for them by some hard-working Committee. Gilwell was no exception to this rule.

Sunday, 9 July, dawned with effortless flourish into yet another day of clear blue skies and brilliant sunshine. Separately, the RSGB Mobile Committee breathed their first sigh of relief of the day. Already, on the rally site, GW3JBH and GW3TSM, together with several other campers and caravanners who had taken advantage of the opportunity to make a weekend of it, were astir. The trade arrived to spread out its wares; G3KGU sought the most tempting layout for his raffle and the Chingford RSGB Group's talk-in stations went on the air. Everything was perfect.

Subsequently the visitors' book reveals entries made by 231 people, though many got away without acknowledging their presence. For the record, the talk-in stations worked eight mobiles on 2m, 24 on 4m, 11 on 80m and 35 on Top Band.

The usual diversions were provided and, additionally, many other facilities by kind permission of the Scout authorities. The Lea Valley Model Aero Club provided a demonstration of radio-controlled flying. The Montarna Quartet proved very popular among all ages playing folk songs and popular numbers, with slight competition from the 4m talk-in station causing rectification in the group's audio system!

KW Electronics displayed a mobile TV camera network, and showed a video recording of the manufacture of the KW2000. Alfred Imhof Ltd. had on site their mobile exhibition showing a range of Eddystone equipment, as well as their own well-known brand of metalwork.

The Gilwell Rally car park. In the foreground can be seen G5DJ and his wife, and G6CL.

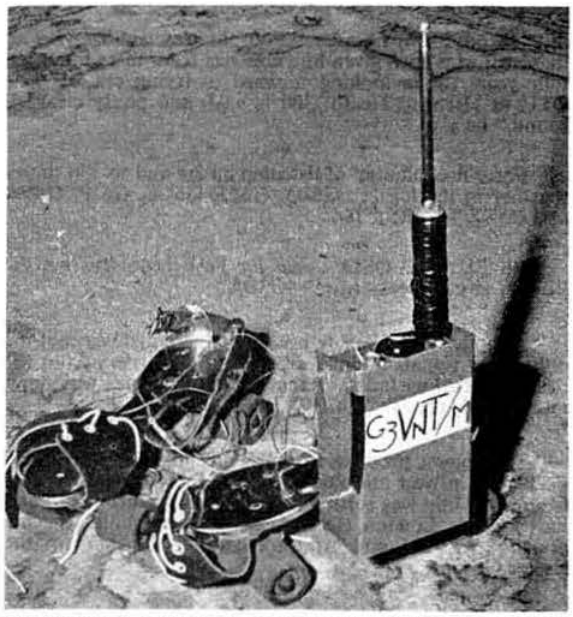
The inquest which followed the event failed to produce a tangible explanation for the fact that the Rally was not better attended. Too many Rallies? A day for the seaside rather than Gilwell? Worried about return-home traffic jams? Surely we don't all need country mansions or USAF bases.

Well by any standards, Gilwell was a successful Rally. Some have said—" the best yet." If losses there were, they were not ours but of those who stayed away. Next year we hope, when the name Gilwell is as familiar as Woburn we may perhaps realise more fully the potentialities of this excellent site; so near to the Metropolis yet offering unrivalled opportunities for a weekend in the country.

Saltash and District Amateur Radio Club's Mobile Rally

The club's third Mobile Rally was held by the riverside at Calstock, Cornwall, on Sunday, 30 July, 1967. This year the weather was poor, and although conditions were not too bad at the rally site, on the higher ground thick mist and drizzle made driving unpleasant—with an inevitable effect on the attendance. Nevertheless there was a gathering of over 300 people, including 70 licensed amateurs and 30 SWLs. Mobiles numbered nearly 40, most of whom were equipped for 160m. There were very few mobiles on 2 or 4m—an apparent reversal of the trend in recent years, although perhaps it's just that Topbanders are a hardier race than v.h.f.-men when it comes to braving the elements! Mention must be made of three u.h.f.-mobiles who were there (all on 70cm)—G8ADP/M, G8AFA/M and G8ARD/M. Two well known DX call-signs who signed in were ZB2AM (G3JFF) and 5N2ABL (G3HZG). There was also a card on the QSL Board inscribed " G9BO—Scourge of the Amateur Bands " but there was no trace of its owner (or his Sherman Tank).

Fortunately it was possible for most of the day's events to take place under cover in the large hall at the rally site. Only two items—the Mobile Topbanders' Race and the



G3VNT of Bristol was winner of the World's Smallest Mobile Competition at the Calstock Rally. These are his roller skates equipped with a transceiver which earned him the position.

Pedestrian D/F Hunt—had to be cancelled due to the weather. Undaunted, G3UBY carried on with giving the children free trips on the River Tamar in his speedboat. Several mobiles went on a Radio-Guided Excursion to Cotehele House and Gardens, a fine medieval National Trust property nearby. They were guided along the intervening four miles of narrow, winding, Cornish lanes by a control station (GB3SAL) at the rally site.

The Rally was formally opened by Joe Pengelly of BBC-TV News, South West; the old call-sign of the pre-war BBC station at Plymouth—5PY—was resurrected for one day when it was presented to him—in the form of a lapel badge! Joe also helped to judge some of the competitions, and presented the prizes at the end of the Rally. The prize for the amateur travelling the longest distance went to Bill Thompson G3MQT/M, who had set out from Hastings at midnight! Bill makes a habit of long jaunts to rallies, but this time he ended up with a BBC cameraman in the back of his car, and duly appeared on TV the following evening. The SWL who travelled the farthest was Frank Parkhurst BRS10663, who came from Yeovil. Prizes for the farthest contacts with the talk-in station GB3SAL en route to the rally were won by G3OLB/M (160m), and G3XC/M (4m *and* 2m). The award for the Best Mobile Installation went to G3UPV (Warminster). In the Frequency Measuring Contest, the calibration of G3RFY's (Bude) mobile receiver was the best—a mere 1,042 c/s different from the frequency of the test signal.

What must have been the finest collection of modern amateur radio equipment ever seen in the South West was on display at the stand of Radio Shack Ltd. of London. All the latest models from the Drake, Swan, SBE, Sommerkamp and Shure ranges were there, with Terry G3STS on hand to demonstrate them. Also present were Taurus Electrical Services of Loughborough, whose G3LHB did a good trade in all the usual commodities.

To sum up, it is felt that although marred by the inclement weather, the event was a success. For this the organizers must thank all the Amateur Radio enthusiasts (and their families) who showed confidence in them by making the journey through dreary weather to Calstock.

G3RFY (left), winner of the Calstock Rally Frequency Measuring Competition, receives his prize from Joe Pengelly. SADARC Treasurer G6AAV/T (right) looks on.

South Shields Mobile Rally

After two years of bad weather on the day of the South Shields rally, on Sunday 9 July warm sunshine prevailed at last for the eighth event held so far. The turnout was a record, with 110 cars and about 300 visitors.

A competition was held in which mobileers were awarded points on questions arising from aspects of mobile operation. G3LEA/M won the prize with 23 out of 25 points. A short driving competition on the site was won by G3WGW. Visitors were invited to attempt a visual radio quiz (valve pins wrongly wired, values of resistor and capacitor networks etc.), and five people achieved nine out of ten points and the name of SWL Alan Dixon of Heworth, Gateshead was drawn out of the hat. Visitors were asked to state frequencies of audio signals and this contest was won by G3CDM of Darlington. For the third year in succession the visitor travelling the longest distance was Bill Thompson, G3MQT, who covered 320 miles from St. Leonards-on-Sea, Hastings, to the rally. He left for home (with a soldering iron as prize) at 18.00 and, we heard later, arrived home at 3.30 a.m. Monday morning.

RSGB NATIONAL MOBILE RALLY

WOBURN ABBEY, BEDFORDSHIRE

BY PERMISSION OF HIS GRACE THE DUKE OF BEDFORD

SUNDAY, 10 SEPTEMBER, 1967

Park opens at 11 a.m., and among the attractions will be the State Apartments, more than 3000 acres and 2000 animals, a Surplus Sale and Trade Exhibition, a Grand Raffle (Ladies and Gents), Children's Playground, Pet's Corner and Boating Lake, Children's and Novelty Sports, Children's Lucky Dip, Amusement Park and Funfair, Woburn Safari Service, Restaurants and Snack Bars.

CAR PARKING IN A SPECIALLY RESERVED RALLY CAR PARK

TALK-IN STATIONS GB2VHF AND GB3RS ON 2m, 4m AND 160m

ORGANIZED BY THE RADIO SOCIETY OF GREAT BRITAIN

News from Headquarters

Report on a Survey of Affiliated Societies

A survey was carried out early in 1967 by the Society's Membership and Representation Committee in an endeavour to obtain certain statistics and to find out whether it is possible to provide greater assistance to Affiliated Societies.

All (it is hoped) Affiliated Societies were sent a letter from the Chairman of the M & R Committee, together with a questionnaire to be completed and returned to Headquarters, but only some 36 Societies replied out of a total of over 250. This is rather disappointing, but it is possible that letters went astray owing to incorrect addresses being held by Headquarters, as clubs do not always notify changes of secretary or other officers.

Of a total club membership only some 42 per cent are RSGB members.

Of licensed members 83 per cent are RSGB members.

Of non-RSGB members 18 per cent are under 21 years of age.

Some 50 per cent of the clubs would welcome a visit and talk by a member of Council of the RSGB. All these clubs are being contacted and given the name of a Council member who is willing to pay them a visit.

Many clubs gave other details and suggestions which were most interesting and valuable to the M & R Committee, who express their thanks for the co-operation given.

RSGB Dinner Club

There were 50 members and visitors present at the meeting on Friday 21 July at the Kingsley Hotel, Bloomsbury Way, London. The visitors included I1SWX, K1USO, K1YZW, KP4BRY, W4QCW, WA6SBO, W8FQS, W9WNV and 9H1R. After dinner Bill Rindone, WA6SBO, and Don Miller, W9WNV, gave a talk on DXpeditions past and future followed by a showing of some colour slides of numerous DXotic spots. The colour and beauty of some of the places visited convinced those present that a DXpedition was the answer to an English winter.

The next meeting of the Dinner Club will be held in October on a date to be announced in the BULLETIN and over GB2RS. All members are invited to attend this informal function and overseas visitors will be most welcome.

At the meeting of the RSGB Dinner Club on 21 July there were visitors from six overseas countries. On the top table: (left to right) Mrs. Bootman (wife of G3MWG); Bill Rindone, WA6SBO; Don Miller, W9WNV; G2BVN; G5DJ; Mrs. Jardine (wife of G5DJ); W4QCW and his wife. In the foreground are 9H1R and Mrs. Clews (wife of G3CDK).

(Photo by G3NMR)

RSGB London Lecture Meeting

The first lecture of the winter session will be given by Graham Roe, B.Sc.(Eng.), A.C.G.I., (G3NGS), of the BBC Designs Department, on Wednesday, 8 November 1967 at the Institution of Electrical Engineers. The lecture will be illustrated by slides and under the title **Colour Television** will cover the following subjects: Colorimetry; Television Principles; Colour Sources; Colour Display Devices; Transmitter Encoding and Receivers and Decoding.

Buffet tea will be served at 6 p.m. and the lecture will commence at 6.30 p.m. Tickets are available from Headquarters on request.

GPO Morse Test

Candidates taking the Amateur Morse Test at the various United Kingdom testing centres will be interested to learn that, whenever possible and if they wish, they may use their own keys for the sending test. They must, however, be of the conventional type and their leads must be fitted with crocodile clips suitable for easy attachment to the terminals of Post Office keys.

Stolen Equipment

Between 4 June and 6 June, the Torbay Amateur Radio Society's premises in Bath Lane were broken into and the main transmitter was stolen from a rack. Anyone who is offered for sale a KW Vanguard serial No. 448, is asked to inform D. T. Hind, G3VNG, Thurlow Road, Torquay, Devon or, of course, the Police. The equipment is the later style with a visor-fronted cabinet.

Pirate Fined

As a result of Post Office enquiries into the suspected unlicensed use of wireless telegraphy transmitting equipment, the following conviction has recently been obtained.

On 13 July 1967 at Hinckley Magistrate's Court, Mr Ian Sharrott of 11 Sunnydale Road, Hinckley, Leics., was convicted of a charge of using wireless transmitting apparatus without the appropriate licence, contrary to the provisions of Section 1 of the Wireless Telegraphy Act, 1949. He was fined £2 and ordered to pay £3 3s. costs, and had all his equipment confiscated, except a tape recorder.

" Planetarium "

A new quarterly journal which will be of interest to all amateur astronomers, many of whom are also radio amateurs, is *Planetarium*, published from the New Planetarium in Armagh, N. Ireland, and edited by Patrick Moore. The first issue, Autumn 1967, is beautifully produced, well illustrated and covers a broad field. Without deliberately setting out to do so it includes some items of interest to the v.h.f. fraternity and particularly an article by H. S. Ridley entitled " The Leonid Meteors." The Editor invites articles from all who are interested in astronomical matters and hopes to include Radio Astronomy as a regular feature.

Just what category such topics as " Moonbounce," meteor scatter, satellite tracking, etc. come into I wouldn't know, but I'm sure Patrick Moore will find one to suit.

The idea is to expand *Planetarium* into an international astronomical journal and we wish it every success.

Planetarium—price 2s. 4d. post free from The Planetarium, Armagh, N. Ireland. A.D.P.

RSGB QSL Bureau

The Society's QSL Bureau will be closed from 9 September to 9 October inclusive this year. Members are asked not to send cards to G2MI which would arrive during this period.

Generator for Loan

A. F. Harrison, G3SEU, has made a generous offer to loan a 250 volt, 50 c/s, 2 kVA generator free of charge to organizers of field days and special functions, and is quite willing to deliver and collect it within a reasonable distance from his home. His address is " Woodlands," Drury Lane, Mortimer, Berkshire.

Tape Recorder Maintenance for the blind

Headquarters has recently been approached by representatives of the Tapes for the Blind Club who are trying to arrange an occasional tape recorder maintenance service for seven members of the club. Through the Verulam ARC it has been arranged that any interested members should contact Mr Cano at Garston 3116 or Mr G. Slaughter, G3PAO at Watford 25526.

Affiliated Societies

BARKING AND DISTRICT RADIO AND ELECTRONICS CLUB
D. A. Bell, Gascoigne Adult Recreation Centre, Gascoigne School, Morley Road, Barking, Essex.

HOLLOWAY SCHOOL AMATEUR RADIO GROUP (73 CLUB)
K. Smith, G3JIX, Head of Physics Dept., Holloway School, Hilldrop Road, London, N7.

ROYAL AIR FORCE GATOW RADIO AND ELECTRONICS CLUB
C. J. Thomas, GW3PSM, DL5YZ, 26 Signals Unit, Royal Air Force, Gatow, British Forces Post Office 45.

WIRELESS INSTITUTE OF AUSTRALIA—TASMANIAN DIVISION
E. A. Beard, PO Box 851 J, GPO Hobart, Tasmania, Australia.

WIRELESS INSTITUTE OF AUSTRALIA—NEW SOUTH WALES DIVISION
Mrs. B. Gerdes, Box 154 PO, Crow's Nest, NSW, Australia.

THE A.S.C. ELECTRONICS SECTION
S. A. Hawkins, Standard Telephones and Cables Ltd., Brixham Road, Paignton, Devon.

THE CULCETH AND DISTRICT AMATEUR RADIO CLUB
J. Levay G3SPB, 7 Crescent Road, Kearsley, Bolton, Lancs.

FIRST AIR TRAINING SIGNAL STATION, GI3VNL, 2349 SQDN. ATC
W/O Robert Williamson GI3RNY, Rear of Intermediate School, Demense, Ballymena, Co. Antrim, N. Ireland.

NUNEATON AMATEUR RADIO SOCIETY
R. T. Pallett, 36 Windmill Road, Nuneaton, Warwickshire.

Representation 1966-1968

The following members have been appointed Affiliated Society representatives.

CHINGFORD
D. A. Platt, G3JNJ, 22 Charcroft Gardens, Ponders End, Middlesex.

ISLE OF MAN
Leonard S. Wright, GD3AIM, 5 Elizabeth Rise, Castletown, Isle of Man.

SHREWSBURY AND DISTRICT
W. A. Lindsay-Smith, 22 Kingswood Crescent, Copthorne, Shrewsbury.

SKEGNESS AND DISTRICT GROUP
L. J. Coupland, G2BQC, 118 Burgh Road, Skegness, Lincs.

Obituary

Walter W. Inder ex-GM5IP

It is sad to record the death of Walter Inder, ex-GM5IP, on 1 July at the age of 78.

Walter was born in Kendal in 1889, and trained as a teacher, becoming schoolmaster at Millhill School, Leicester, in 1910. He later trained as a W/T operator and as a member of Marconi Marine was assistant operator on the *S.S. Mauretania* in 1912. During the summer of that year he took part in what were probably the first experiments in ground to air communications using an early bi-plane flying over Lake Windermere. He served in several well known ships and in 1914 came to Aberdeen as Instructor to the Wireless College, becoming Principal in 1918. After the war he founded a radio retail business, and in 1924 joined the BBC, rising to Engineer in charge by 1932 and retiring in 1950. He was a keen amateur and founded the first Aberdeen Amateur Radio Society early in 1921. Walter was tremendously enthusiastic about his hobbies, opera—bridge—tennis and bowls and was a staunch Freemason.

Sympathies are extended to his two daughters and family.

GM5JK and GM6IZ, along with many old radio and broadcasting friends, were present at the funeral. E.G.I.

Silent Keys

We record with sorrow the passing of the following amateurs:

F. C. Turner, G3VI of Black Notley, Nr Braintree, Essex.

E. Mitchell, G5MV of Scarborough, Yorkshire.

R. Peake, GI3JFX, of Belfast, N. Ireland.

H. F. Edmonds, BRS24512 of Ilford, Essex.

N. W. Hellon, BRS25178 of St. Neots, Huntingdonshire.

L. Hough, BRS29422 of Mickleover, Derby.

Special Events Station

GB3MID will be the call used by the Manchester and District ARS at an Exhibition station in the grounds of Alkrington Hall, Middleton, on Saturday, 16 September. The station will be active on all h.f. bands and is commemorating the Diamond anniversary of the Middleton Boy Scout Group.

Headquarters Fund—List No. 34

The following are additions to the list of those who have contributed to the fund.

J. A. Steele, G3KZI, on behalf of the London S.S.B. Dinner Committee, L. Cooper, G5LC, G. Buck, DJ8GB, L. Woerner, DJ1BZ, J. McCormack, J. J. Phillips, G3KSK, C. Collins, G8SC, T. L. Herdman, G6HD, J. F. Shepherd, GM3EGW, and six members of the RSGB Finance and Staff Committee.

Total amount contributed to date: £2621 15s. 2d.

RADIO AMATEURS' EXAMINATION

The Society's centre for the 5 December examination will be at the College of Preceptors, Bloomsbury Way, London, WC1. Applications to sit the examination must be sent to the General Manager, RSGB, accompanied by the entry fee of £1 15s. for members of the RSGB or £2 5s. for non-members.

CLOSING DATE FOR ENTRY IS 31 OCTOBER

The Call From Tristan

SHORTLY before his recent return to Tristan da Cunha, Verulam Radio Club took advantage of a last-chance opportunity to arrange a talk by Alan Hemming ZD9BE. Members were fascinated to hear of Alan's many and varied activities as Postmaster and Radio Operator on this formerly ill-fated volcanic island in the South Atlantic. With a population of less than 250 the island comprises one lonely settlement on the north-west shore in a barren wind-swept setting close to the cone of the most recently-active " vent " which dominates the landscape like a giant slag-heap. " It's still quite warm and gases still seep out" says Alan. His official duties, apart from those of postmaster and philatelic agent, include maintaining and operating the radio installation and handling regular radiogram traffic through Capetown, not only for the islanders but also for shipping in the area. A sideline is a regular broadcasting service for the island, including a record request programme. Alan admits he " helped himself " to a wavelength for this service—" you might call me a pop pirate I suppose "—but with 1500 miles between him and the nearest habitation his QRP music broadcasts aren't likely to cause QRM!

Somehow he finds time to get on the air and during his last tour of duty he maintained regular skeds with the Science Museum station GB3SM. For Amateur Radio he has used dipoles and says he gets out pretty well with them but he is now on his way back to Tristan with a Swan 350 and a 3-element tribander which will, he says, result in his being heard on 20m, 15m. and 10m. rather than the 14,260 kc/s spot he has stuck to pretty consistently during the past 18 months. The commercial installation on the island has until recently relied on long wires held up by three 60 ft. wooden masts put up by the Navy in the Second World War. After a spot of guy tightening one of them broke in half and this has prompted consideration of alternative systems. A steerable log periodic is Alan's dream.

Quite apart from the series of excellent coloured slides which gave a good impression of life on the island, Alan's ready store of anecdotes delighted his audience. Like the time he arranged a series of regular skeds on 20m. with the holder of a ZS call, who happened to be an opthalmic specialist, so that the island's doctor could get advice about a Tristan patient suffering with serious eye-trouble. During this series of contacts the South African authorities complained to the ZS that his conversations with the Tristan doctor were illegal since he, the island doctor, was not licensed. By the time of the next scheduled contact Alan announced that " acting in his capacity as Postmaster-General—" he had tested the doctor, passed him out and issued him with a ZD9 call! " A bit naughty, of course " says Alan, " and I wouldn't do it again, but I felt the circumstances justified it."

Another amusing story he told was of the time he was asked to " flash " a passing ship using an Aldis lamp. " I hadn't used one before," said Alan, " but I had a go." " It turned out to be a Russian ship and certainly flashed back, but he was too quick for me and I still haven't the foggiest idea what he said!"

Ships call only infrequently at Tristan, there is no airstrip and the radio station is usually the island's only link with the outside world. As recent history has shown, disaster has a way of striking quickly in this lonely island and it is a big responsibility for one man to operate and maintain single-handed the equipment and aerials on the station, especially with essential spares many thousands of miles away and often weeks in coming through. Alan Hemming, adaptable Welshman that he is, measures up to the demands of the job with a cheerful ingenuity that is in the best traditions of the " Amateur Spirit." His only qualification for the job, he modestly maintains, was his GW3SWQ call, but those who met him at St. Albans recently know differently.

G3GJX

Alan Hemming (right) talking with Verulam members G3OFH, G3VXO, G3RPA and G3GJX. One of ZD9BE's QSL cards, bearing a map of Tristan da Cunha, is being held by one member.

(Photo by Paul Fletcher)

Radio Amateur Old Timers' Association Ninth Reunion

NO less than ten Past Presidents of the RSGB (Ernest Gardiner, G6GR, Vic Desmond, G5VM, Bill Scarr, G2WS, " Dud " Charman, G6CJ, Leslie Cooper, G5LC, Arthur Milne, G2MI, Reg Hammans, G2IG, Dr. R. L. Smith-Rose, Major-General Eric Cole, G2EC and Roy Stevens, G2BVN) and four Vice-Presidents (J. W. Mathews G6LL, W. H. Allen, G2UJ, D. N. Corfield, G5CD and F. G. Lambeth, G2AIW) were present at the Ninth Reunion of the Radio Amateur Old Timers' Association held on Friday, 5 May, 1967, at The Horse Shoe, Tottenham Court Road, London. The attendance of 85 was a record.

Making their first appearance at a reunion were a number of pre-war holders of an artificial aerial licence who, in accordance with a decision reached a year ago, are eligible to join the Association provided they obtained a full licence in 1946 and have retained it ever since.

Chairman for the evening was Leslie Cooper, G5LC, and the guest of honour was Sir Francis McLean, C.B.E. (Director of Engineering, BBC). Introduced by his former business colleague Reg Hammans, G2IG (now Director of Engineering of Granada TV), Sir Francis recalled his early association with Cecil Goyder, G2SZ, when both were young engineers at Standard Telephones & Cables Ltd. about 40 years ago. Sir Francis spoke of his between-the-wars activities as a junior member of the BBC and of the important role that radio amateurs had played in the development of the Corporation.

Association Report

In his annual survey of the affairs of the Association G6CL reported that Bruce Hackney, G6YP, George Jessop, G6JP, Don Morgan, G2SM, Bill Nutton G6NU, Ernie Dolman, G2DCG, E. H. Trowell, G2HKU, A. S. F. Berry, G2BDP, Stan Keville, G2AKT, Fred Lambeth, G2AIW, Len Hardie, GM2FHH, Alan Bayliss G8PD, S. E. Janes, G2FWA, Francis Rose, G2DRT, Eric Chambers, G2FYT, A. Shillito, G2FRY, Marcus Samuel, G4FX, A. H. Bruce, G5BB, Malcolm Shaw, G6OF, Don Davies, G3RQ, P. G. Hester, G5HS, Frank Fletcher, G2FUX, P. H. B. Trasler, G3DU, Bill Winsford, G4DC, W. E. Caughey, GI2DZG, E. W. L. Brownjohn, G8AJ, Michael King, G3MY, Frank Cooper, G2QT, H. Heath, G2AOK, Roy Scott, G2CZH, Fred Ward, G2CVV, Dick Canning, G6YJ, Ron Munn, G2AOL, Maurice Pyle, G2BLA and Ken Ellis, G5KW, had become members during the year and that membership now stood at 222, an increase of 28 since the previous Reunion. During the year L. H. Thomas, G6QB, Leslie Gardner, G5GR, Basil Scudamore, G6BS, James Blake, G5BC, Rowley Scott-Farnie, G5FI, and Honorary Member, Horace Freeman had passed on. A donation had been sent to The Guinea Pig Club in memory of G5FI.

G6CL reported that he had kept in touch with the widows of a number of old timers who had been the recipients of parcels at Christmas. Visits had been made to Mrs. Marcuse, widow of Gerald Marcuse, G2NM and Mrs. Simmonds, widow of Ernest Simmonds, G2OD. Mrs. Marcuse had recently mounted the unique collection of G2NM QSL cards in handsome albums. The RAOTA seat placed outside Bosham Parish Church in memory of G2NM was in constant use. The Association had been able to provide some assistance to members in need of help but information sent in confidence to the Secretary would enable the Benevolent Fund to be used more fully. The Benevolent Fund had increased, thanks to many donations from members and a helpful contribution from the 1966 Reunion.

Suggestions

It had been suggested by a newly-joined member that the Association should issue a News Letter but with the high cost of postage this could not be done unless the Association became an annual subscription-type of organisation. Interested members were invited to write to the Founder-Secretary. Another member had suggested that some past Reunions had been rather too serious in character with too much emphasis placed on the early days of Amateur Radio. The same member had also suggested that the RSGB should be asked to look favourably on a contest for young amateurs to contact old timers on, say, 3·5 Mc/s during a limited period on a Sunday in December or January. A proposal by another member that a Chairman, Vice-Chairman and a small Committee be appointed to assist the Secretary in running the Association was rejected—the vast majority of members feeling that the present informal-type Association is entirely satisfactory.

During the evening G6CL, on behalf of Arthur Edwards, G6XJ, presented powder compacts to Nell Corry, G2YL and May Gadsden to mark their long association with Amateur Radio.

New Honorary Member

A proposal by the Secretary that Sir Francis McLean be elected an Honorary Member of the Association met with the unanimous approval of the members present and was adopted with acclamation. In putting forward the proposal G6CL commented that he could think of no call-sign more appropriate than " G2LO " to issue to their new Honorary Member!

Nostalgia

Nostalgia—a feature of RAOTA Reunions—was introduced by " Dud " Charman, G6CJ, who spoke on a wide range of subjects but with special reference to the part played in the early days by the late L. H. Thomas, G6QB—" Uncle Tom " to all his contemporaries. His sudden death shortly after the 1966 Reunion had come as a great shock to his radio friends throughout the world. G6CJ recalled how " Tommy " had contributed a series of articles to the RSGB BULLETIN under the title " Soliloquies from the Shack." G6CJ also made amusing references to the preference shown by pre-war South London amateurs (of which " Tommy " was a prominent member) to the Goyder Lock system of transmitter control.

Roll Call

The following were present at the Reunion:
G2DC, DX, EC, HP, IG, IY, JF, KI, KJ, MI, MR, NG, NH, NN, OU, PU, QT, UJ, UV, VB, WS, XV, YL, G2AIW, AKT, ALO, BDP, BLA, BVN, CVV, CZH, DRT, FYT, G3DU, MI, WP, WW, G4DC, OI, G5BQ, BZ, CD, CV, DJ, JO, KW, LC, MA, PP, TN, VM, WG, WP, XB, YY, GW5BI, G6CJ, CL, FI, GR, HR, JQ, LL, LQ, MN, NR, OX, PA, QM, RB, YJ, YP, GI6TK, G8CK, DF, KW, NY, PB, PD, QO, SM, TY, Sir Francis McLean, Dr. Smith-Rose, Miss May Gadsden.

G6CL

IARU

Region 1 calling

INTERNATIONAL AMATEUR RADIO UNION

Reciprocal Agreement with Switzerland

Following an application made to the Swiss PTT at Bern the reply was received that at the present time Amateur Radio licences can only be granted to foreigners resident in Switzerland. However, these provisions are being revised and in future it is planned to issue licences to foreigners for short visits. The first UK licensee to hold a Swiss licence was G3OOH, Gerald Lander, now active from Geneva as HB9AJU.

New Finnish Prefix

From 18 October to 6 December all Finnish club stations are authorized to use the prefix OF instead of OH. There are approximately 50 active club stations. The issue of this special prefix is to mark the 50th anniversary of independent Finland and its use will end at midnight (22.00 GMT) on 6 December which is the annual Finnish Independence Day.

Intruder Watch

The Honorary Organizer reports little change during the past month with some activity on the diplomatic links which use frequencies at the top end of the 14 Mc/s band. A new Russian commercial link is active using c.w. and RTTY on 21,046 kc/s, and the war in Sinai provoked some short term activity from the Middle East area. GW3PSM will be on hand during the RSGB Exhibition to provide information on the Intruder Watch.

Andorra and the Irish Republic

A revised address for applications to operate in **Andorra** is: Monsieur le Prefet des Pyrenees-Orientales, Delegue permanent pour l'Andorre, Prefecture, Perpignan, Pyrenees-Orientales. Applications to operate in the **Irish Republic** should be sent to: The Secretary, Department of Posts and Telegraphs, Telegraph and Radio Branch, General Post Office, Dublin, 1. It may be noted that circuit diagrams of the equipment to be used have to be sent with the completed application forms.

Pakistan

It was with considerable pleasure that the Society received a telegram from AP2AD, Ahmed Ebrahim, in West Pakistan saying that his licence had been restored. It is hoped that this will mean a general resumption of activity from Pakistan. It is known that negotiations for the restoration of the licences had been in progress for some time and the result reflects considerable credit upon AP2AD and his fellow amateurs.

Greece

Readers active on the h.f. bands will have noted the absence of SV stations operated by Greek nationals. The reason for this is not yet known but all support is being given to the Greek National Society (RAAG) in their efforts to have the ban lifted.

Beacon Stations

The following list of beacon stations outside the UK is compiled from the latest information available. However, the writer will appreciate a note of any omissions or errors so that a correct record may be kept.

Country	Call-sign	Location	Operating Times	Frequency (Mc/s)
Austria	OE5THL	Linz	07.00-19.00 GMT	144·005 145·995
	OE1XXA	Vienna	Continuous	145·950
Czechoslovakia	OK1KCU/1	Bournack (GK29J)	Continuous	114·675 432·034
	OK1VR/1	Zaly	Continuous	145·96
Faroe Islands	OY3VHF	Torshavn	Continuous	145·260
Finland	OH3VHF	Tammersfors	Continuous	
	OH3UHF	Tammersfors	Continuous	
	OH8VHF	Oulu	Continuous	144·800
Germany	DJ2LF	Dortmund (DL35H)	Continuous	432·005
	DL0AR	08° 49' E 51° 54' N	Continuous Continuous	29·000
	DL0PR	Schleswig-Holstein (not yet operational)	—	145·971
	DM3IGY	Collm Observatory	Intermittent	28·000
Gibraltar	ZB2VHF	—	Continuous	70·26
Malta	9H1MB	—	Continuous	70·10
Norway	LA1VHF	Gausta Mountain (ET13C)	Continuous	145·150
	LA2VHF	Trondheim (FX42E)	Continuous	145·200
	LA3VHF	Harstad (IC48D)	Continuous	145·250
	LA4VHF	Bergen (CU47C)	Continuous	145·300
Poland	SP7VHF	Near Kielce (KK10A)	QRV all times except Monday when used as a Club station	144·010
	SP7UHF	Near Kielce (KK10A)	As for SP7VHF	432·030
St. Helena	ZD7WR	—	Continuous	28·992
Sweden	SM4MPI	Faben, 100 km W. of Stockholm (not yet operational)	—	145·960
	SM4UKV	(Not yet operational)	—	145
Yugoslavia	YU2VHF	HF28J	Continuous	146·00
	YU1VHF	JD29G	Continuous	145·99

European Band Plan

This has been adopted by IARU Societies in Region 1.

Frequency Band	Types of Emission
3·5 – 3·6 Mc/s	C.w. only
3·6 – 3·8 Mc/s	C.w. and phone
7·0 – 7·04 Mc/s	C.w. only
7·04– 7·1 Mc/s	C.w. and phone
14·0 –14·1 Mc/s	C.w. only
14·090 Mc/s	RTTY
14·1 –14·35 Mc/s	C.w. and phone
21·0 –21·15 Mc/s	C.w. only
21·15–21·45 Mc/s	C.w. and phone
28·0 –28·2 Mc/s	C.w. only
28·2 –29·7 Mc/s	C.w. and phone

G2BVN

Election of Council, 1968

In accordance with Article 52 of the Society's Articles of Association the Council has nominated the following Corporate Members to fill the vacancies on the Council which will occur on 31 December next:

Ordinary Members

Mr. B. Armstrong, G3EDD
Mr. E. G. Ingram, GM6IZ
Mr. R. F. Stevens, G2BVN
Mr. J. W. Swinnerton, G2YS

Not later than **10 October** next any 10 Corporate Members may nominate any other Corporate Member to serve on the Council by delivering their nomination in writing in a single document to the General Manager, together with the written consent of such nominee to accept office if elected, but each nominator shall be debarred from nominating any other person for this election.

Council Members Elected by Zones

Not later than **10 October** next any 10 Corporate Members resident in Zone A (Regions 1 and 2), Zone E (Regions 10 and 11), Zone F (Region 15) and Zone G (Regions 12, 13 and 14) may nominate any other duly qualified Corporate Member resident in the Zone concerned to serve on the Council by delivering their nominations in writing in a single document to the General Manager, together with the written consent of such nominees to accept office if elected but each such nominator shall be debarred from nominating any other person for this election.

Candidates for nomination as Council Members elected by Zone must be resident within the Zones for which they are nominated and the nominators must be resident in the same Zone.

The present Council Member for Zone A is Mr. L. Goldsborough, G3ERB; for Zone F, Mr. H. E. McNally, GI3SXG, and for Zone G Mr. J. F. Shepherd, GM3EGW. There is no Council Member for Zone E at present.

Society Affairs

A Brief Report on the July 1967 Meeting of Council

THE meeting was held on Friday, 7 July, 1967, and was attended by The Executive Vice-President (Mr J. C. Graham in the Chair), Messrs. B. Armstrong, N. Caws, J. Etherington, J. C. Foster, E. G. Ingram, L. E. Newnham, J. F. Shepherd, R. F. Stevens, G. M. C. Stone, J. W. Swinnerton, G. Twist, E. W. Yeomanson (Members of the Council), H. J. Hallen and T. R. Preece (Headquarters Staff).

Apologies for absence were submitted on behalf of the President, Mr A. D. Patterson, Mr H. E. McNally and Mr D. W. Robinson (General Manager).

Election of Council for 1968

The Council decided by ballot to nominate Messrs. B. Armstrong, E. G. Ingram, R. F. Stevens and J. W. Swinnerton, retiring members of the Council, to fill the four vacancies amongst the Ordinary Members of Council, which will occur on 31 December 1967. (A notice calling for nominations for these vacancies and for vacancies amongst the Council Members Elected by Zones, appears above).

Membership and Affiliation

The Council elected 164 members (110 Corporate and 54 Associate) and approved 28 transfers from Associate to Corporate Membership.

Affiliation was granted to the following:

A.S.C. Electronics Section (Standard Telephones and Cables, Paignton).
Culcheth and District Amateur Radio Club.
Nuneaton Amateur Radio Society.
First Air Training Signal Station, 2349 Squadron, A.T.C.
Wireless Institute of Australia, N.S.W.
Wireless Institute of Australia, Tasmanian Division.
R.A.F. Gatow Radio and Electronics Club.

Region 10 ORM at Cardiff, 16 September, 1967

The attendance of Messrs. Etherington and Stevens as delegates from Council was approved.

Title of the Society's Journal

The Council approved the change in the title of the Journal (to take effect from 1 January, 1968) to "*Radio Communication, incorporating RSGB Bulletin.*"

Public Relations Officer

A full report of recent activities was tabled and it was noted that the "Speakers Scheme" had met with a good response from a number of areas. Council approved the preparation of a draft leaflet explaining Amateur Radio. This would be used for publicity purposes at Exhibitions and similar events, and would be available to Affiliated Societies.

Visits of Council Members to Affiliated Societies

The Executive Vice President reported on the progress of the scheme and a number of members of Council volunteered to visit Societies in their areas.

Wireless Telegraphy Bill, 1967

Council approved the preparation of a leaflet for circulation to Affiliated Societies and for distribution at the RSGB Exhibition. This would contain details of the Society's actions in connection with the Bill.

New Headquarters—35 Doughty Street

It was reported that formal completion of the purchase had been delayed owing to the failure of the outgoing tenant to clear the building. (A leaflet giving full information on the new headquarters is enclosed in this issue of the BULLETIN).

Recommendations of Committees

The Council accepted Recommendations relating to: the Fourteenth International V.H.F /U H.F. Convention to be held at the Winning Post Hotel, Whitton, Middlesex. on 27 April, 1968 (V.H.F. Committee); awards in connection with the First Top Band Contest (H.F. Contests Committee); awards in connection with the Second 70 Mc/s (Open) Contest (V.H.F. Contests Committee); the attendance of four members of the Scientific Studies Committee at the IQSY at Cospar Assembly organized by the Royal Society in London between 17 and 22 July; the co-option of the following as corresponding members of the Committee; A. J. Oliphant, GM3SFH, Professor Martin Harrison, G3USF and Ian Sheffield, GM3VEI (Scientific Studies Committee).

Minutes of Committees

The Council accepted as reports the Minutes of the following Committee Meetings: RAEN Committee (29.4.67), H.F. Contests Committee (4.5.67), Mobile Committee (10.5.67), V.H.F. Committee (22.5.67), Exhibition Committee (26.5.67), Finance and Staff Committee (2.6.67), Technical Committee (6.6.67), Scientific Studies Committee (12.6.67), Mobile Committee (12.6.67) and Education Committee (17.6.67).

The Council was in session for four hours.

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. Letters for inclusion in this feature should be concise and preferably not more than 200 words in length.

High Pass Filter Design for TV Protection Against H.F. Transmissions

Although the information presented in GI3TZB's article is accurate, I feel he has missed the following points.

(i) Most TV receivers have a reasonable rejection of signals at i.f.; it is below about 30 Mc/s where the rejection is poor. If the transmitter is radiating around 35 Mc/s one l.p.f. is better than several h.p.f.'s!

(ii) The matching half sections will introduce a notch at 0·8× cut off frequency and this may as well work for its living, i.e., placing the cut off frequency at 36 Mc/s gives a deep notch (over 60dB) around 28·8 Mc/s. Since cross modulation and blocking are non linear effects decreasing at 2dB per dB some of this 60dB may be sacrificed by stagger tuning the two half sections with a g.d.o. to give useful protection over the 28 Mc/s band. (You won't find this in the book but it works!)

(iii) A filter made in a tin can which still bears the maker's name has more psychological effect than one which looks neat and expensive!

B. PRIESTLEY, G3JGO.

Langley, Slough, Bucks.

The author replies:

The comments made by G3JGO show that he has not gone into my filter design in enough detail, and I must disagree with him on all three points.

With present day TV receivers using printed circuit techniques, the i.f. is as subject to break through as any other part of the receiver, and this also includes the video amplifier. It was not suggested that a high pass filter could be substituted for faults which should have been cleared at the transmitter.

The matching half-sections are provided to ensure that R_0 remains reasonably constant over the passband of the filter, i.e., that the filter is correctly terminated in its design impedance. Thus we must have $M = 0{\cdot}6$, but we also get a bonus of additional attenuation from these terminating sections, and we get the equivalent of an M-derived section which has a frequency of infinite attenuation F_∞ at 32 Mc/s.

$$M = \sqrt{1-\left(\frac{F_\infty}{F_c}\right)^2}$$

$$0{\cdot}6 = \sqrt{1-\left(\frac{F_\infty}{40}\right)^2} \text{ as } F_c = 40 \text{ Mc/s.}$$

$$\therefore F_\infty = 0{\cdot}8 \times 40$$

$$\therefore F_\infty = 32 \text{ Mc/s}$$

As the filter has a design F_∞ of 37·5 Mc/s, a bonus F_∞ at 32 Mc/s, and a prototype section increasing slowly from 40 Mc/s downwards, by the time that the attenuation of the M-derived sections is decreasing, the prototype section has reached a high enough value to enable the filter to retain its high attenuation characteristic.

This is why the filter can hold its own without using any " not in the book " manipulations.

Finally on the matter of filter housing, a TVI free picture is the best psychology in the world.

W. J. M. MCKINNEY, GI3TZB.

Belfast 4.

The Field Day Dispute

Once again, this contest has given much pleasure to probably a thousand or so radio amateurs in Great Britain. However, now that the contest is over, I think there will be many with feelings or nasty suspicions about certain other clubs. NFD has so many rules to break and which are impossible to enforce or check that some adjustments to the rules could improve the contest considerably. Surely it is time these rules were rationalized and brought up to date.

Our club, the East Worcestershire Amateur Radio Group, is a small young club. For the past four years we have participated in this contest and for the first three years we abided by all the rules. Over these years these nasty suspicions have developed particularly when listening to these 10 watt transmitters on the air or on seeing details of the equipment employed by the contestants.

Now although we are a small young club we do not lack extremely capable and experienced c.w. contest operators, good equipment, aerials or sites. Yet we continually turned in mediocre scores. We decided the principle item we lacked was power into the aerial and this year the club decided to go outside the contest rules and adopt practices we believe have been employed by other clubs in the past. These practices included erecting the aerials early and spending a considerable period of time tuning them and running at a power input in excess of 10 watts. The power input adopted was 30-35 watts, much less than we believe other clubs have employed in the past.

By stating that we did not observe the rules of the contest, we know we have been disqualified, but we hope that our score will be published.* Once again we were convinced that many of the signals we heard during this year's contest represented a Californian 10 watts. We also convinced ourselves that our performance was as good as could be expected with our choice of bands and that with clubs competing on similar terms we will have produced a very similar score.

At our club, at an ORM, and meetings with members of other clubs, there has been considerable discussion about NFD, its purpose and what it represents. At these discussions the following questions were raised, the answers considered and amendments to the NFD rules suggested.

What is the purpose of NFD? Is it to demonstrate that radio amateurs can set up an emergency station in a field in case of national disaster? This was one of the purposes suggested.

If the above is the object of the contest, NFD must be the biggest farce in Amateur Radio. When are you going to get a year's notice of a disaster so that a club can rehearse it weekends ahead? Also, in the event of a disaster, who would dream of operating a 10 watt transmitter, with only one receiver and the aerials restricted in height and gauge? No! one would operate the most efficient and powerful station that could be assembled. Nowadays, emergency communications should be handled by RAEN who know what they are doing.

What other reasons can there by for imposing the apparently absurd NFD rules in what is thought to be a DX contest?

Another reason suggested was to allow the small clubs to compete on even terms with the large wealthy clubs. As a member of a small club I would like to know how these rules help our club? Maybe in the past a small club could normally be expected to have a 10 watt all band transmitter available but not a high power rig. With the changing fashions to commercially manufactured equipment, a small club finds it very difficult to raise suitable equipment for NFD, particularly when only four or five members are interested in NFD, and even fewer in constructing equipment to be used only once a year with a risk of it being made redundant by a change in rules (ours was).

No, the rules as they stand do not aid a small club to compete on equal terms with the large club. The present rules only favour the unscrupulous club.

What does NFD represent? Nowadays, it is the premier club contest organised by the RSGB. By making it a portable contest all clubs can select the best available site in their area thereby allowing all clubs to compete on as near an equal footing as possible.

Against this premise I recommend that consideration be given to bringing the rules up to date. In revising the rules, every effort should be made to reduce the amount of inspection required to enforce the rules. As a starting point, this club suggests the following amendments:

1. Power. To be within the terms of the licence, possibly with the contest divided into high and low power sections.

* Page 527, August issue : East Worcestershire : 1040 points (single station entry). The winner achieved 1208 points and 2nd place was held with 1023 points.

2. No restrictions on aerials other than those imposed by the licence (a quad gives as much gain as a 3 element beam).
3. Station to be erected on the day of the contest (very many people work a five day week and much " sorting " of equipment takes place on site before starting time).
4. Operation should be permitted from any form of shelter. These days, many tents can also be described as caravans, extensions to motor caravans or extensions to cars.
5. The scoring system should be modified possibly along the lines of the 7 Mc/s DX contest. On the h.f. bands, G contacts should not count for points but double points for portable stations contacted and commonwealth contacts.

We trust that serious consideration will be given to these suggestions. In this area there is overwhelming support for the first two. The other suggestions have not been discussed widely.

NFD is a good contest but needs to be improved to make it a fair contest. This club has decided that we do not intend to sit up all night fiddling around with a 10 watt transmitter on the h.f. bands without a hope of doing well, nor do we intend to make false declarations.

One final comment, I do not think the QRM would be any worse than during the recent contest.

R. W. NOLAN, G3KWK
Chairman, East Worcestershire Amateur Radio Group
Redditch, Worcs.

QRA Locators

Congratulations to G3JKV on discovering the Georef system (June issue, p. 399). The attractions are obvious and I give it my full support. I consider that the present moment is opportune for a change as RSGB Headquarters are out of stock of QRA Locator Maps (and the Belgian variety is not very good anyway).

I have yet to meet anyone who likes the QRA system as a system. I do not know who evolved it, but I would like to congratulate him as the most successful practical joker of recent times. The joke has gone far enough; we are not in the Common Market yet, let's go it alone and bring sanity to the situation while we have the chance.

BRIAN ARMSTRONG, G3EDD
Great Wilbraham,
Cambridge.

Band Planning

For years now there has been a Gentleman's agreement that s.s.b. stations work at the top end of 80m: 3·7 to 3·8 Mc/s. It seems recently they are creeping lower and lower down the band especially on Sunday mornings. Some of the trouble seems to be that s.s.b. stations come on to give G2MI a report after reading the news on s.s.b. They then only move a few kc/s away and start up a net.

Several Sundays these nets have caused splashing over G8ML while he has been reading the news. Why these s.s.b.'ers need to stay in the lower end I can't understand because on checking between 3·7 and 3·8 I find there is plenty of space. The a.m. Chaps have little enough space between 3·6 and 3·7 Mc/s; with a Buzzysaw Carrier that is always on 3625 spreading 20 kc/s and Scheveningen Radio on 3670 kc/s. *So what about this gentleman's agreement Chaps?*

Perhaps some of the newly licensed amateurs don't know about this agreement but the old hands do.

Perhaps s.s.b. could be included in the Band Plan

Don't think I have anything against s.s.b.—I haven't. I intend to go s.s.b. myself soon but you will not find me lower than 3·7 unless there is a very good reason, any more than you would find me on *a.m.* in the *c.w. end* of the band.

J. E. BOWDEN, G2AYQ
St. Agnes, Cornwall.

I put forward the suggestion that the old custom of allocating the 3·5-3·6 section of 80m for c.w. be discontinued.

Otherwise—as I see it—we will lose it to " other services." And we deserve to. 80 is, to most of us, a daylight band, and the most important. Yet I find that only on rare occasions the odd c.w. stations using that large portion, while the a.m. stations are crowded into 3·6-3·7!

It would be no hardship to the c.w. boys to share the whole of the band.

If we do not make better use of our precious frequencies no one can blame " other services " for moving in and taking possession.

I do not wish to go against tradition—but let's be sensible.

It would be interesting to have other readers views on this subject.

HECTOR COLE, G3OHK

P.S.—I think the free adverts for members a good idea.
Seaton, Workington,
Cumberland.

The recent references to the Intruder Watch prompts me to suggest that before we start trying to sort out " Outsiders, " we try to set our own house in order. It is my experience that, on 40m at least, one suffers more from " phone stations " both a.m. and s.s.b. consistently operating below 7050 kc/s, than one does from teleprinters on 20m. As I understand it, the European Band Plan, a Gentleman's agreement, suggests that c.w. be used from 7000 to 7100, and that Phone be used from 7040 to 7100. The percentage of c.w. stations operating above 7050 is very small considering. What ever one's feelings on the plan, up to now most stations/operators have acted like Gentlemen, and kept within the limits of the plan. If these Ungentleman like operators do not agree, at least go about things in a gentleman like way, and try to have the plan altered. Personally, I think that the plan as it stands is quite adequate.

I notice that the number of advertisements appearing in the August BULLETIN has increased somewhat. Could it have anything to do with cost per word?

Is the reason for the non-appearance of " Letters . . . " due to NFD 67 results? If so, I fail to see why. I'm sure that most people regard this page as being just as important as other articles. How else can we get to know what the chap in the other part of the UK thinks, we cannot all get to the AGM, and that is only an annual event.

E. H. ROSS, GM3LWS
Glenrothes, Fife.

[*Fair comment on " Letters . . ." Mr Ross, but unfortunately over the past month or two we had been contemplating moving the editorial dept. to Coventry . . .*]

Half-Baked Hams?

In recent issues of the BULLETIN there have been articles from the PRO of the RSGB emphasizing the necessity for projecting a favourable image of Amateur Radio.

With the same end in view, can we not resist the infiltration of this dreadful word " Ham "? In the past, British magazines devoted to radio matters have avoided it, but the word is now beginning to creep in. A report on the wireless the other morning used it. It has appeared even in technical articles in the BULLETIN recently.

I feel it is damaging to our image that we should be referred to as " Hams." After all, a ham actor, or a ham-handed person is one who is clumsy, or inexperienced, or inept in some way. One can imagine what the general public makes of " Radio Ham," particularly when there is TVI in the neighbourhood—probably caused by a sewing machine or an electric drill—obviously, the inept " Ham "!

One or two people to whom I have spoken about this take the attitude that it is no use trying to avoid it. I think it is. If we British amateurs refrain from referring to ourselves as " Hams " and point out to people who use the word to us that it is an unpopular one, we need never have it inflicted upon us.

J. R. ROBINSON, G3SAX

(*We wholeheartedly endorse Mr. Robinson's views. The word "Ham" has been used in the* BULLETIN, *but only in a lighthearted vein or where we must admit its existence (Mr. Robinson has found five ways of using it in his letter!). We have a standing rule to substitute " amateur."*

RAE Instruction Centres

COURSES in Preparation for the City and Guilds of London Institute Radio Amateurs' Examination will be held at the following centres during the session beginning in September 1967.

Aldridge, Staffs. Aldridge Evening Institute, Tynings Lane, Aldridge, Staffs. Fridays, 7.30 p.m. commencing 15 September. Lecturer will be N. H. Hyde, G3PJM.

Barry, Glamorgan. College of Further Education, Colcot Road, Barry. Enrolment 6.30-8 p.m. during the week beginning 4 September. Fees: 10s. for ages 16-18, 30s. for ages over 18, and free for ages under 16. Tuesdays (Theory), Thursdays (Morse Code and practical), 7.30-9.30 p.m.

Beckenham, Kent. Beckenham Evening Education Centre, 28 Beckenham Road, Beckenham, Kent. Enrolment on 28 September. Thursdays, 7-9 p.m. A Morse class will be available if required. Further details from M. D. Bass, B.Sc., 42 Clevedon Road, London, SE20.

Boreham Wood, Herts. Boreham Wood College of Further Education, Elstree Way, Boreham Wood, Hertfordshire. Wednesdays, 7-9 p.m. commencing 27 September. Lecturer is G. Benbow. Further details from K. Staple, Boreham Wood College.

Brighton, Sussex. Brighton Technical College, Engineering Dept., Richmond Terrace, Brighton 1. Tuesdays (RAE), Thursdays (Morse), 6.30-8.45 p.m.

Broxbourne, Herts. East Herts. College of Further Education, Turnford, Broxbourne, Herts. Enrolment during evenings after 11 September, Wednesdays and Thursdays, 7-9.30 p.m.

Chatham, Kent. Medway College of Technology, Fort Horsted, Chatham, Kent. A course will be arranged if sufficient applications are received. Details from E. Goodman, Head of Electrical Engineering Dept., Medway College.

Colchester, Essex. North East Technical College and School of Art, Sheepen Road, Colchester, Essex. Enrolment 11-13 September. Tuesdays, 6.30 p.m., commencing on 19 September. Lecturer is A. J. Smith, G3UKJ.

Corbridge, Northumberland. Corbridge County School, Corbridge, Northumberland. Commencing in September. Full details from V. Allison, G3TNX, 14 Silvendale Drive, Winlaton, Co. Durham.

Erith, Kent. Erith Technical College, Erith Road, Kent. Enrolment 12-14 September, 6.30-8.30 p.m.

Glasgow. Allan Glens School, Cathedral Street, Glasgow, C.1. Enrolment 4-7 September, 7 p.m. Fee is 30s.. Tuesdays (Theory), Thursdays (Morse instruction and licence regulations), 7-9.30 p.m., commencing 12 September. Lecturers will be A. Fraser, GM3AXX and D. Rossi.

Gosforth, Northumberland. Gosforth Evening Institute, Near Newcastle on Tyne, Northumberland. Provided sufficient applications are received, E. Chicken, C. Eng. AMIERE, G3BIK, will be conducting a course covering theory and Morse. Details from G3BIK, 52 Marlborough Avenue, Grange Park, Gosforth, Newcastle on Tyne 3.

Harlow, Essex. E. P. Essery, G3KFE, is prepared to conduct an RAE course in Harlow. Details from G3KFE, 17 Ascot Close, Parsonage Lane, Bishops Stortford, Herts.

Ilford, Essex. Ilford Literary Institute (County School for Girls), Cranbrook Road (adjacent to Gants Hill Station). Enrolment 7 September, 8.30 p.m. Fees: Adults, RAE 40s., Morse 32s.; under 21: RAE 25s., Morse 20s. Wednesdays, 7.15-9.15 p.m., commencing 20 September. Further details from W. G. Hall, G8JM, 48 Hawkdene, North Chingford, London E4. (Please enclose an s.a.e.).

Lichfield, Staffs. Lichfield School of Arts and Evening Institute, Lichfield, Staffs. Enrolment during first week of September. Lecturer will be J. H. Beamand, G3DZT.

London

E4. Chingford Community Centre, Simmons Lane, Chingford, E4. Enrolment during week commencing 18 September. Fee: 30s. plus affiliation to centre. Applicants under 14 can be accommodated, with a reduced fee. Mondays, 7.30-9.30 p.m., commencing 25 September.

E17. Marhouse Youth Centre, Walthamstow, E17. Details from K. L. Smith, G3JIX, 82 Granville Road, Walthamstow, London, E17.

N7. Holloway Evening Institute, Montem School, Hornsey Road, Holloway, London N7 (Grafton Radio Society). Enrolment 18-22 September, 7-9 p.m. Fees: one class each week (RAE or Morse) 30s.; two classes (RAE and Morse) 40s. Mondays (RAE), 7-10 p.m., Wednesdays (Morse) 7.30-9.30 p.m., courses commencing 25 September. Instructor will be R. H. Smart, G3MMC.

N12. Finchley County School, High Road, Finchley, N12. Enrolment 11-14 September, 6.30-9 p.m. Wednesdays (RAE), 7.30-9.30 p.m., Thursdays (Morse) 7-9 p.m. Details from E. D. D. Turpin, G3MNK, 2 The Rye, Eaton Bray, Dunstable, Bedfordshire.

SE5. Kennington School, Cormont Road, Kennington, SE5. Thursdays, 7.30-9.30 p.m. commencing 14 September. Instructor will be B. R. Meredith, G2CYU.

Loughborough, Leics. Loughborough Technical College, Radmor, Loughborough, Leicestershire. Fee: 42s. 6d. Tuesdays (Morse), 6-7 p.m. (RAE), 7-9 p.m., commencing 19 September. Lecturer will be D. R. Doughty, G3FLS.

Lowestoft, East Suffolk. Lowestoft College of Further Education, St. Peter's Street, Lowestoft. A course will be arranged if sufficient applications are received. Details from A. F. Ward at the college address.

Northampton. Northampton College of Technology, St. Georges Avenue, Northampton. Details from A. Parthenis at the college address.

Northwood, Middlesex. Northwood School, Potter Street, Northwood. Enrolment 12-14 September, 6.30-8.30 p.m. Mondays 7.15-9.15 p.m. Instructor will be H. Hardy.

Port Talbot, Glamorgan. College of Further Education, Port Talbot, Glam. Enrolment, 4 September.

Sheffield, Yorks. Western Road Evening School, Sheffield. Commencing 20 September, 7 p.m. Details from J. Bell, G3JON, 25 Edale Road, Sheffield, 11 (Telephone 61281).

Stafford. College of Further Education, Tenterbanks, Stafford. Mondays and Fridays, commencing 25 September. Lecturer will be K. Cunningham, G3PBW.

Stockport, Lancs. Avondale Evening Centre, St. Lesmo Road, Stockport, Lancs. Details from G3FYE, 6 Ross Avenue, Davenport, Stockport, Lancs.

Westfield, Bedfordshire. Westfield Further Education Centre, Bedford. Details from J. R. Clarke, 12 Robin Hill, Brickhill, Bedford.

Weston-super-Mare, Somerset. Weston-super-Mare Technical College. A course will commence in September.

Weybridge, Surrey. Brooklands County Technical College, Heath Road, Weybridge. Enrolment 11, 12 September. Mondays, 6.30-9 p.m., commencing 18 September. Details from J. E. Lacey, c/o Mechanical and Electrical Engineering Dept. or telephone Byfleet 46485.

Radio Amateur Emergency Network News

By S. W. LAW, G3PAZ*

WHILST comfortably drowsing in that deckchair in the garden, or having been driven indoors by a sudden shower, why not give a thought to the characteristics and hazards of the area covered by your RAEN Group. Each area has its own particular types of geographical and other special hazards, and a while spent in serious consideration of these could pay dividends in the unfortunate event of a sudden call-out. Railway cuttings and embankments are all too vulnerable to a sudden cloudburst which might easily result in a landslide and consequent derailment. The local airport is another obvious danger point. Possibly there are a number of other hazards peculiar to your own area which will well repay study. The point at issue, of course, is whether you are certain that your Group can speedily set up a communications chain from these points to your base or control stations. There may well be land configurations that will make some sort of relay set-up essential, but it is a little late in the day if you only discover this at the time of an emergency call-out. Given a fine week-end, why not make a social occasion with a picnic for the families and combine "business" with pleasure by having a mobile or portable check-up on the terrain. One *could* call up a special exercise for the purpose, of course, but the other method could give the necessary information in a more " popular " way.

RAIBC

We are delighted to hear that applications are being received from members of the Radio Amateurs Invalid and Bedfast Club who feel that their enforced "free time" could be put to good use in the RAEN framework. When we remember that many of the RAIBC members hold transmitting licences and the SWLs spend much of their time at their " rigs," the mutual advantages to be gained are obvious, Any controllers who have such applications passed to them might give very serious consideration to the advantages to be gained from the co-operation of those who, through no fault of their own, have time on their hands whilst the more fortunate of us are busy at work.

There is, of course, the other side of the coin. Whatever may be said about RAEN personnel in certain quarters (we are not deaf to the armchair critics!) the fact remains that a call-out can be a tough time even for those in the best of health, and even if one is not out and about during an emergency, the strain of a prolonged session at the " rig " can tell on the best of us. Contest types, please confirm! So, with the best will in the world, a good deal of thought should be given to the problem of how best to integrate these willing and technically capable folk into our organisation. There should be a job for all who wish to employ their hard-won skill in helping the User Services to allay the anguish of disaster victims with all possible speed, and we should seriously consider how to achieve this.

Ready?

It is a human failing not to be able to see the wood for the trees. May we, therefore, take the liberty of stating what should be the obvious? If you are called out nobody can say for how long you will be away, and should you be sent to the incident site you are likely to be rather busy. Needless to say, your Controller should see to it that you are relieved after a reasonable time (always assuming that somebody is available), but it is up to you to see that you are " kitted up " for a spell. To try to work in discomfort may be very " noble " but it's not very sensible. It is fairly certain that the weather will be unpleasant; life is like that. You will also get hungry and thirsty. Well, it doesn't take a few moments to fill a flask and grab a packet of biscuits—and you'll be a better operator if you are not beset by the pangs. Don't fondly imagine that you can rely on the User Service to look after *your* " creature comforts "—they will be far too busy with the work in hand, and in any case they are relying on you to look after your side of things. Have a little think about this and make sure that you don't get caught unprepared if " it does happen "—it will!

*11 Chisholm Road, Croydon, Surrey, CRO 6UQ.

Don't Argue

Let's get this straight—we undertake to pass emergency traffic for the User Services. The content of the message is no concern of ours, and provided that the message is properly submitted by an authorised person in a reasonably legible form it is our job to see that it reaches its destination correctly and as fast as possible. By all means check that you have the message down right before it is sent, but once you have, don't think you know better than the sender and transmit your version of it! Medical terms in particular may look a trifle odd to us, but " amateur " jargon might well be incomprehensible to a medical man.

Watching Your Interests

The RAEN Committee met once again on 19 August at RSGB Headquarters and in view of the holiday season there was a most gratifying attendance. The five-hour session was very fully occupied with matters appertaining to our particular interests, including one or two somewhat knotty points. All those present eventually departed well satisfied that RAEN is very much alive.

Keep Cool

How is your cooling system? On the car, we mean. The modern car battery is only intended to be a " floating " device, with an occasional big punch for starting the engine (pause for thought!). When your mobile is " static " you will most certainly have to run your engine to keep the battery volts up after a while. Unfortunately cars are designed to rush through the air (been in any good traffic blocks lately?). So it might be as well to flush out that cooling system sometime and have a look at the fan belt. Don't say we didn't remind you!

Off-Channel?

Has your Group got a check oscillator with which to line up all your rigs? Don't fondly imagine that just because you all use the same crystals they will bring you up on the spot frequency—just like that! Get together for a " tweaking " session sometime—you may get a shock.

RAEN at Woburn

Since we mentioned the possible RAEN get-together at Woburn in last month's column, we hear that the Manchester Independent Group will be bringing down their Communications Trailer Unit for use as a RAEN talk-in station. This should be well worth a visit so put it down in your diary *now*—you are going, we hope?

Raynet Contest

Having published the rules for the 1967 Raynet Contest we can only sit back and remind you that it's your show. So let's see a record entry this year, shall we? See you down the Log!

CONTEST NEWS — RESULTS—REPORTS—RULES

Fourth 144 Mc/s Contest (Portable) 2 July, 1967

Position	Portable Call-sign	Points	QSO	QTH	Receiver Input	Transmitter Output	Power	Aerial
1	G3EFX	33086	115	8 N Brighton	2N3819	320	25	10 ele Yagi
2	G3HBW	24493	76	8 SW Dorchester	2N3819	320	25	8/8 slot
3	GW3LEW	24401	54	10 N Bridgend	TW Comm	3/10	10	7 ele Yagi
4	GW3RUF	24181	87	Summit Snowdon	6DS4	320	25	10 ele Yagi
5	G3FRV	23353	95	24 NW Bognor	6CW4	7/40	25	10 ele Yagi
6	GW3OXD	22218	97	3 N New Radnor	CC Conv	320	20	10 ele Yagi
7	GW3BA	20834	106	5 SE Welshpool	GM0290	640	25	10 ele Yagi
8	G3NJF	20462	69	Claxby N. Lincs.	6CW4	640	24	6/6
9	G3ORL	20432	74	6 SW Midhurst	GM0290	320	25	10 ele Yagi
10	G3RXX	19520	97	5 E Ludlow	2N3819	320	25	10 ele Yagi
11	G3NUE	19467	88	22 SW Hereford	2N1742	320	25	10/10
12	GW3OIW	18028	77	8 W Mold	417A	320	15	8 ele Yagi
13	G3OBD	17975	92	8 E Ludlow	2N8319	320	22	10 ele Yagi
14	GW3KMS	17677	82	8 W Wrexham	6CW4	320	15	4/4
15	G3JEQ	16950	70	12 SW Newbury	6CW4	4/7	10	6/6
16	G4JJ	16102	70	14 E Buxton	—	310	12	10 ele Yagi
17	G3XC	15142	36	St. Agnes Beacon	6CW4	320	20	6 ele Yagi
18	G5PI	13980	60	18 E Leicester	EC88	320	25	6 ele Yagi
19	G3TEK	12855	60	11 SW Newbury	TW Comm	TW Comm	10	4 ele Yagi
20	G3OUL	12759	63	3 NE Wells	2N3819	320	20	10 ele Yagi
21	G3RCV	12411	44	7 N Brighton	—	320	21	5 ele Yagi
22	G3LTY	12294	52	6 W Canterbury	6DS4	310	12	4/4
23	GW2HIN	11587	46	5 N Pontypool	TW Comm	TW Comm	12	6 ele Yagi
24	GW3ITZ	10912	64	5 SW Flint	6CW4	310	10	8/8
25	G3LHA	9581	49	12 E Rugby	6ER5	310	20	3 ele Yagi
26	G3FD	8591	36	8 NE Luton	—	320	18	8 ele Yagi
27	G5HZ	7950	50	Nettlebed Oxon	—	310	15	6/6
28	G3LLE	7785	41	9 NW Sheffield	6DS4	310	10	10 ele Yagi
29	G3VRW	7606	36	4 S Burnley	AF139	TT15	20	8/8
30	G3ERD	7233	37	13 NW Derby	6CW4	310	10	10 ele Yagi
31	G3CMH	7137	37	—	—	—		(No Cover Sheet)
32	G3TND	7096	36	5 S Bristol	6CW4	310	15	5/5
33	G3MA	6223	43	3 NW Gloucester	6J6	832	18	4 ele Yagi
34	G3PUO	6135	26	10 N Millom	6CW4	320	25	8 ele Yagi
35	G3NKL	6110	39	6 W Wigan	—	—		(No Cover Sheet)
36	G3RHU	5520	27	5 SW Royston	6CW4	6J6	4	8/8
37	G2WS	5488	27	4 NE Cheddar	—	2/6	9	5 ele Yagi
38	G3BFD	4216	40	4 E Tatsfield	E88CC	310	12	6/6
39	G3WHK	4170	52	2 SE Banstead	GM0378	310	12	8 ele Yagi
40	G3UVU	4128	29	10 E Thirsk	6CW4	310	15	6/6
41	GM3EGW	2010	10	7 E Kinross	—	310	12	8 ele Yagi
42	G3JDM	1660	12	12 SW Gailey	6CW4	832	15	5 ele Yagi
43	G3WJJ	1621	14	Win Green	TW Comm	TW Comm	15	5 Yagi
44	G3MWZ	1029	9	8 N Horncastle	—	—	5	4 ele Yagi

Forty-four portable stations took part in this contest on 2 July, the last 2m portable contest of 1967, compared with 37 in 1965 and 43 in 1966. Of these 35 were G, eight were GW and one GM.

The leading station was G3EFX/P operated by G3POI, G3SHK and G3MED from Ditchling Beacon near Brighton, Sussex, some 800 feet a.s.l. Their score of over 33,000, which works out at about 280 points per QSO, was way ahead of the runner-up, G3HBW/P who achieved nearly 25,000 points from Hardy's Monument in Dorset, was operated by G3HBW and G3WDX, and shows a points per km score of about 320. Congratulations to you all.

Subject to Council approval, a cup will be awarded to the winners and certificate of merit to the runners-up.

As a matter of possible interest to future entrants it would appear that the strategy of G3EFX was to concentrate on the EU during the first couple of hours or so and pick up the G later. Their log shows 11 G, 12 PA0, five ON and five F stations between 10.00 and 12.00 while G3HBW worked eight F and one PA0 during the same period. Scores during that time were 9700 and 8300 respectively although Arnold picked up a nice 1200 point contact with F9DM at 10.50 which is the best DX recorded during the contest.

Conditions were a little above average although not to be compared with the opening during the 1965 contest. C.w. activity seemed as low as usual and only two complaints were received of grossly overmodulated portable stations. There were few comments about the rules for, and the timing of, the Contest and so it is assumed that a reasonable compromise has now been reached, but you can't please all of the people all of the time can you?

QRA Locators

Whatever may be your views on the use of QRA Locators it would be very much appreciated by the contestants if you would at least have your own noted for transmission if requested and indeed, if required by the rules of the contest. Several comments were made about non-availability of, or incorrectness of, QRA locations passed, but with an EU opening during the contest, QRA locators were highly to be recommended.

Comments from Letters

" Not sure if we have won this time. If not, it might be " SSSSHHH you know who " or " they " or again perhaps " that lot." (G3EFX). But you see Clive it was " those " after all.

" Why not a simple scoring system? The days of s.e.o. rigs and counting up contacts by mile really have passed." (G3FRV) Suits me Ron—I have just spent about a week on these logs.

" A decimal multiplier could be used for every 100 ft. height giving the stations at lower altitude a better chance." (G3NJF). Good idea, but see G3FRV's comment above.

" We wasted rather a lot of time trying to extract QTH from Continentals." (G3ORL). Point taken Doug. Matter will be referred to V.H.F. Contests Committee.

(Continued on next page)

" What about a 70cm Field Day next season? " Comments on the suggestion would be appreciated. (G3FD).

" Due to an intermittent PE generator apologies to those stations who might have called in vain." (G3PUO). Accepted Les, but I spent a long time on you!

" The double requirements of QRA and QTH is surely absurd." (G2WS). But see comments above on rules, last sentence Bill.

" Drastic lack of signals mid afternoon and QRM from local sheep." (G3UVD). Not sorted from the goats?

" At 10.00 GMT on the day of the contest I decided I would have a bash . . . collected up the bits and lifted the 24V 85 Ah battery to top of the hill and unruffled and unruptured I eventually did get on." (GM3EGW).

General

Requests for logs and cover sheets have been passed on to the appropriate authority as have the photos from G3MWZ and A5082.

Check and listener logs have been received from G2DHV, G3WGU, G3KPJ, G3DAH, A5032, A5082, A3942, A5124, A4871, BRS28005, BRS26234 and BRS15744. Many thanks.

A. H. D.

First 1296 Mc/s Contest 1967

Position	Call	Score	QSOs	QTH	Final Stage	Input	Receiver	Aerial
1	G8ARL/P	2691	19	Newbury	2C39A	18	K6AXN (Transistorized)	3 ft. dish
2	G3NNG/P	2052	21	Uffington	2C39A	10	1N416B Mixer	6 ft. dish at 10 ft.
3	G3MCS	1947	22	Aylesbury	3CX100	30	K6AXN	3 ft. wire dish at 40 ft.
4	G3EFX/A	1907	21	Woodcote	DET24	15	1N21 Mixer	4 ft. dish at 150 ft. a.g.l.
5	G3FP	1460	19	Croydon	2C39A	20-80	Radial Cavity	3 ft. dish at 34 ft.
6	G3GWL	1408	13	Bletchley	2C39A	40	Paramp and Trough Line	4 ft. dish at 28 ft.
7	G8AEJ	1371	21	Croydon	2C39	50	Radial Cavity	3 ft. dish
8	G3OBD/P	1328	10	Newbury	2C39A	24	Radial Cavity	4 ft. dish at 10 ft.
9	G3OXD/A	940	9	Dudley	DET24	15	K6AXN	Trough
10	G5FK	926	14	Ruislip	2C39A	—	G3RPE/K6AXN	18 in. and 6 ft. dishes
11	G8AJU	878	16	Ruislip	2C39A	17	K6AXN	8/8 at 25 ft.
12	G8AGM	723	9	High Wycombe	MA4060B	6	K6AXN (Transistorized)	8 ele stack at 44 ft.
13	G2RD/A	610	9	Caterham	TD100	5	Crystal mixer	3 ft. dish
14	G3LHA/P	605	5	Rugby	2C39 (P.A.)	20	K6AXN	Trough at 22 ft.
15	G2RD	340	5	Wallington	TD100	5	Crystal mixer	3 ft. dish
16	G3CBU	316	4	Basingstoke	3CX100	—	K6AXN	8/8 at 20 ft.
17	G3TND	270	3	Bristol	2C39A	45	Radial Cavity	4 ft. dish
18	G3PWJ	6	1	Birmingham	BAY66	1	K6AXN	8/8 at 43 ft.

There were 18 entries submitted for this contest, and among these were logs from four portable stations. A check log was received from G8AOD.

From views expressed it would appear that the length of 24 hours was quite justified, as it enabled repairs and modifications to be made during the contest. A suggestion was made, however, that the 70cm contest could be held prior to the 23cm event to permit the exchange of views, and preference was also expressed for a longer period between the contests. G3NNG pointed out his view that more contacts could have been made if G8—3 calls were allowed to use c.w. (a wish shared by many B Licence holders).

From the logs received it appears that most of the activity is in the south of England. The farthest contact both ways was made between G3OXD/A and G3MCS, a distance of 125 km.

Equipment

The two popular choices of converter were the K6AXN and the radial cavity which appeared in *QST* in September 1959. Two of the K6AXN converters used employed transistor crystal multiplier chains and transistor i.f. amplifiers. G3GWL used a parametric amplifier in front of a trough line converter. On the transmitting side power input varied within the limits 1 to 80 watts. The 2C39A tripler was the popular choice of transmitter final stage. G3LHA/P used a 2C39A p.a. with 20 watts input driven by a 2C39A tripler. G3AGM and G3PWJ used varactor diode triplers. G3PWJ used a QQVO3-10 on 2m feeding a BAY66 tripling to 70cm and feeding another BAY66 to reach 23cm with 1 watt output. The most common form of aerial was the 3 ft. dish at varying heights from 10 ft. above ground level. G3EFX/A used a 4 ft. dish 150 ft. above ground, fed by 150 ft. of nitrogen-filled co-ax.

Awards

Congratulations go to the leading stations, especially the winner G8ARL/P, who will receive a miniature cup. G3NNG/P will receive a certificate of merit as runner-up. These awards are, of course, subject to Council approval.

B. W. G.

Stratford-on-Avon D/F Qualifying Event

Fourteen teams lined up for the fourth qualifying event of the year on 30 July, near Broadway in the Cotswolds. Although the weather was threatening, it managed to produce only a few spots of rain during the contest. Transmitter A was hidden in a wood on a steep slope four and a half miles from the start, and successive competitors wore a clear path through the undergrowth. Transmitter B, about seven miles from the start, was in thick bushes on a disused railway embankment, between two dismantled bridges. One of these spanned a stream, and as most of the competitors chose to approach from that direction they were faced with the problem of keeping their feet dry.

Eric Mollart's guardian angel was again hard at work, and he was able to find transmitter B one minute before the second transmission. Brian Mahoney was hot on his heels.

Unfortunately Mr D. A. Findlay of the H.F. Contests Committee was unable to attend because of illness. We wish him a speedy recovery, and the organisers would like to assure him that there were no complaints of unfair practices in his absence.

Position	Name	Club	Time of Arrival A	Time of Arrival B
1	E. Mollart	Oxford	14.34	13.59
2	B. Mahoney	Rugby	14.47	14.34
3	M. Hawkins	Oxford	15.15	14.14
4	W. North	Chiltern	15.15½	14.30
5	T. Gage	Oxford	14.31½	15.16
6	G. Peck	High Wycombe	14.35	15.32
7	I. Butson	Oxford	15.51	14.50
8	D. Newman	Rugby	15.54	14.32
9	R. Pearce Boby	Oxford	16.09	14.49
10	I. Jackson	Rugby	15.33	16.19
11	P. Tyler	Oxford	15.36	16.29
12	J. Mordaunt			14.51
13	D. Nasey		15.06	
14	E. Treloggen	Oxford	15.37	

144/432 Mc/s Winter Cumulative Activity Contests 1967

These are the amended rules for the Winter contests.

1. Rules. The General rules for RSGB contests published in the January 1967 issue of the RSGB BULLETIN will apply except as superseded by the rules of this contest.

2. Contacts. (i) A station may be contacted once during each activity period.

(ii) Contacts may be made on all permitted modes except A2 (m.c.w.).

3. Only four of the seven activity periods will count towards the contest. Entrants transmitting during more than four activity periods may choose their best four results.

4. Eligible Entrants. Single operator, fixed stations only.

5. Scoring will be on the basis of one point per km.

6. Contest Exchanges. (*a*) RST or RS reports followed by serial number. Serial numbers advance throughout the activity periods.

(*b*) Location information.

(i) 144 Mc/s. Only QRA locators are required on the logs for the purposes of scoring. However, contestants are reminded that they may exchange any other type of location information if they wish.

(ii) 432 Mc/s. QRA locators or a distance and bearing from a town identifiable without ambiguity on the Ordnance Survey " Ten-mile " map.

7. Entries. (i) Should be submitted on RSGB Contest Log Sheets. QRA locators should be entered in column 5. In the 432 Mc/s event columns 6 and 7 may be used for the " Ten-mile " map locations, if used.

(ii) Must be post-marked not later than 14 days following the last activity period.

(iii) The cover sheet must be made out in accordance with the General Rules.

8. Awards. At the discretion of Council, certificates of merit will be awarded to the winners of the two bands.

Cumulative Activity Contest 144 Mc/s (Winter) 1967

Duration—19.30-21.00 GMT

Activity Period	Date	Mode
1	9 September	Phone only
2	23 September	C.W. only
3	7 October	Phone only
4	21 October	C.W. only
5	4 November	Phone only
6	18 November	C.W. only
7	9 December	Phone only

Cumulative Activity Contest 432 Mc/s (Winter) 1967

Duration—21.00-22.30 GMT. All modes may be used (see *Contacts*)

Activity Period	Date	Activity Period	Date
1	9 September	5	4 November
2	23 September	6	18 November
3	7 October	7	9 December
4	21 October		

Second 1296 Mc/s Contest (Open) 1967

1. Date and Time: 18.00 GMT on Saturday, 7 October to 18.00 GMT on Sunday, 8 October, 1967.

2. The General Rules for RSGB contests as published in the January 1967 issue of the BULLETIN will apply except where superseded by the rules of this contest.

3. Crossband contacts to any other v.h.f. or u.h.f. band may be made as long as one station is transmitting on the 23cm band. Only *one* crossband contact may be made with each station. Crossband contacts must be clearly marked.

4. Contacts may be made on any permitted mode between 1296 and 1298 Mc/s.

5. Scoring will be on the basis of one point per kilometre for two way contacts on the 23cm band and half points may be claimed for crossband contacts.

6. Contest exchanges:

(*a*) RST or RS reports followed by serial number.

(*b*) QTH or QRA. The QTH must be identifiable on the ordnance survey " Ten-mile " map.

7. Logs should be submitted on RSGB Contest Log sheets. QTH in column 5. QRA in Column 6. Operators call-sign, sections B/C in column 7. Points claimed.

8. Sections: A—Fixed stations, single operator. Log keepers do not count as operators.
B—Club stations, A stations and fixed stations (multi-op).
C—Portable stations.

9. Entries:

(*a*) The cover sheet must be made out and signed.

(*b*) Entries must be postmarked not later than 15 days following the contest.

10. The entry should *not* be sent to RSGB HQ, but direct to the adjudicator of the contest at the address below:

V.H.F./U.H.F. Contests Committee,
20 Pembury Road,
Bexleyheath, Kent.

Those requiring acknowledgement of receipt of entry should enclose a stamped addressed postcard.

11. At the discretion of Council, awards will be made in each section to the winner and awards for the runner-up in each section will be made if there are ten or more entries in the section.

Third 432 Mc/s Contest (Open) 1967

1. **Date and Time:** 18.00 GMT on Saturday, 14 October, to 18.00 GMT on Sunday, 15 October, 1967.

2. The **General Rules** for RSGB contests will apply except where superseded by the rules of this contest.

3. Stations may operate from more than one site in sections B and C, but if this is done they must clearly indicate to stations that they contact that they have changed locations. If a station is worked from more than one site, only one contact (the best) may be claimed for points.

4. **Contacts** may be made on any permitted mode except A2 (m.c.w.) on frequencies between 432 and 434 Mc/s.

5. **Scoring:** One point per kilometre.

6. **Contest Exchanges:** (*a*) RST or RS reports followed by serial number.
(*b*) Location information: *Both* QTH and QRA must be sent.

7. **Sections:** A—Fixed Stations, single operator. Log keepers do not count as operators.
B—Club stations, /A stations and fixed stations (multi-op).
C—Portable stations.

8. **Logs** should be submitted on RSGB contest log sheets. QTH in column 5, QRA in column 6. Operator's call-sign, sections B and C, column 7. Points claimed.

9. **Entries:** (*a*) The cover sheet must be made out and signed.
(*b*) Entries must be postmarked not later than 15 days following the contest.

10. The entry should *not* be sent to RSGB HQ but direct to the adjudicator of the contest at the address given below:

V.H.F./U.H.F. Contests Committee,
20 Pembury Road,
Bexleyheath, Kent.

Those wishing for acknowledgement of receipt of entry should enclose a stamped addressed postcard.

11. At the discretion of Council, awards will be made in each section to the winner and awards for the runner up in each section will be made if there are ten or more entries in the section.

Correction to 7 Mc/s DX Contest Rules

In section 6 of the rules, the first sentence under the heading " Bonus Points " should read: " **British Isles Stations.** A bonus of 20 points may be claimed for the first contact with each new *country*." The rules appeared on page 408 in the June 1967 issue of the BULLETIN.

Third 144 Mc/s Contest (Portable) 1967

It may be of interest to members that the aerial used by G3DTB in the contest held on 7 May, was only a dipole mounted on a hand held transceiver, and not a five element beam as shown in the results table. G3DTB was placed 35th from a total entry of 39.

RSGB Slow Morse Practice Transmissions

The following Slow Morse Practice transmissions are sponsored by the RSGB. Alterations and additions to this list should be sent to the Honorary Organizer, M. McBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex.

Clock Time	Call-sign	Mc/s	Town
Sundays			
09.30 †	G3KZZ / G3TNF	1·920	South Shields, Co. Durham / Gateshead
09.30	G3HZL	1·940	Isleworth, Middlesex
09.30	G3TYB	28·400	Ashford, Kent.
09.45	G3USK	1·975	Mablethorpe, Lincs.
10.00	G2FXA	437·400 to North	Stockton-on-Tees
10.00	G3TTK	1·860	Coalville, Leics.
10.15	G3CGD	1·875	Cheltenham
10.30	G2FXA	437·400 to South	Stockton-on-Tees
10.30	G3SFO	1·850	Doncaster, Yorks.
11.00	G3PFZ	1·915	Liverpool
11.00	G2FXA	1·900	Stockton-on-Tees
11.00	G3PFZ	1·915	Liverpool
12.00	G3VNC	1·825	Hertford
12.00	GM3HBY	1·832	Glasgow
12.00	G3SVD	1·870	Reading, Berks.
12.00	G3HVI	1·890	Stoke-on-Trent
12.00	G3GNS	1·910	Weston-super-Mare
12.00	G3TLH	1·960	Wakefield, Yorks.
14.30	G3UGF	1·844	Halifax, Yorks.
17.30	G3TNF	1·920	Gateshead
20.30	G3WFC	1·915	Brentwood, Essex
20.45	G3IFF	1·992	Havant, Hants.
Mondays			
17.30	G3TNF	1·920	Gateshead
18.30	GW3UMB	1·880	Colwyn Bay
18.00	G3SWR	1·980	Middlesbro', Yorks.
18.30	G3NCZ	1·920	Blackburn, Lancs.
19.00	G3WGU	1·880	Bispham, Lancs.
19.00 †	GC4LI / GC2FMV	3·500	Jersey, C.I.
19.00	G3NNW	433·080	Rochdale, Lancs.
19.30	G3CZA	1·970	Ely, Cambs.
20.00	G3USK	1·975	Mablethorpe, Lincs.
20.00	G3KAN	1·990	Northampton
20.00	G3IBJ	1·910	Southampton, Hants.
20.00	GI3JEX	1·860	Belfast
20.15	G3SAZ	1·845	Ashford, Middx.
20.30	G3TOF	1·915	Harlow, Essex
20.45	G3IFF	1·992	Havant, Hants.
21.30	G3SVD	1·870	Reading, Berks.
Tuesdays			
17.30	G3TNF	1·920	Gateshead
19.00	G3UPA	1·850	Sutton Coldfield, Warks.
19.00	G3PXX	1·875	Neston, Wirral
19.30	G5UF	1·970	Dorchester, Dorset
19.30	G3SWP	1·850	Doncaster, Yorks.
19.30	G3WGU	433·500 to South-east	Bispham, Lancs.
20.00	G3FWW	1·880	Burnham-on-Sea, Soms.
20.00	G3TPV	1·910	Hythe, Hants.
20.00	GM3UWX	3·590	Blshopton, Renfrewshire
20.15	G3UIJ	1·845	Whitton Middlx.
20.30	G2ABC	1·915	Woodford, Essex
20.45	G3IFF	1·992	Havant, Hants.
21.30	G2ABC	144·060 / 144·750	Woodford, Essex
22.00	G3HZM	1·925	Manchester

Clock Time	Call-sign	Mc/s	Town
Wednesdays			
17.30	G3TNF	1·920	Gateshead
18.30	G2FXA	1·900	Stockton-on-Tees
19.00	G3NNW	433·080	Rochdale, Lancs.
19.30	GM3HBY	1·832	Glasgow
19.30	G3WGU	433·500 to South-East	Bispham, Lancs.
19.30	G3UJD	1·825	Farnborough, Hants.
20.00	G8QU	1·970	London N22
20.30	G3HZL	1·845	Isleworth, Middx.
20.30	G3KGU	1·915	Theydon Bois, Essex
20.30	G3SJE	1·870	Harrow, Middlesex
20.45	G3IFF	1·992	Havant, Hants.
21.00	G3HVI	1·890	Stoke-on-Trent
21.00	G8RIS	1·980	Cromer, Norfolk
Thursdays			
17.30	G3TNF	1·920	Gateshead
18.00	G5SWR	1·980	Middlesbro', Yorks.
18.30	GW3UMB	1·880	Colwyn Bay
18.30	G3NC	1·968	Swindon
19.00	G3LGK	434·326 to South-West	Ilkeston, Derbys.
19.00	G3WGU	1·880	Bispham, Lancs.
19.30	G3GNS	1·910	Weston-super-Mare
19.45	G3LGK	434·326 to South-East	Ilkeston, Derbys.
20.00	GI3JEX	1·860	Belfast
20.30	G3LGK	434·326 to North-West	Ilkeston, Derbys.
20.45	G3IFF	1·992	Havant, Hants.
21.00 †	G3ROE / G8TIQ	1·915	Harlow, Essex
Fridays			
17.30	G3TNF	1·920	Gateshead
18.30	G3NCZ	1·920	Blackburn, Lancs.
19.30	G3PQF	1·825	Farnborough, Hants.
19.30	G5UF	1·970	Dorchester, Dorset
20.00	G3WKV	1·915	Ilford
20.15	G3SAZ	1·845	Ashford, Middx.
20.45	G3IFF	1·992	Havant, Hants.
21.00	G3RIS	1·980	Cromer, Norfolk
21.30 †	G3UCZ / G3SUU	1·915	Pudsey, Yorks. / Bradford, Yorks.
21.30	G3JCS	144·525	Caversham, Berks.
Saturdays			
08.30	G3WCS	1·980	Liverpool
10.00	G3TTK	1·860	Coalville, Leics.
12.30	G3WCS	1·980	Liverpool
13.00	G2FXA	1·900	Stockton-on-Tees
14.00 †	GC4LI / GC2FMV	3.600	Jersey, C.I.
17.30	G3TNF	1·980	Gateshead
20.00	G3KPO	1·980	Peterborough
20.30 †	G3TLJ / G3UXI	1·925	Roydon, Essex / Harlow, Essex
20.45	G3IFF	1·992	Havant, Hants.

† Alternately

Channel Islands, Northern Ireland, Scotland and Wales are inadequately covered by this service to the SWL. The Honorary Organizer would be pleased to hear from any member in these areas or any other part of the British Isles, who would be willing to make regular Slow Morse Practice Transmissions.

MOBILE RALLIES

Sunday, 10 September, 1967

RSGB Woburn Abbey Rally

Woburn Abbey, Beds. (see page 593)

23-24 September, 1967

Scottish Mobile Rally and Region 14 ORM

Culzean Castle, Ayrshire.
See page 585 for details.

Sunday, 24 September, 1967

Harlow Mobile Rally

National Grid Reference TL506080.
Talk-in stations: from 10.30 a.m. on Top Band, with the possibility of a 2m station.

G3ERN is arranging fine weather for the event, which will include the usual attractions of Junk Sales and associated exhibits!

CLUBROOM

A Monthly Survey of Club and Group Activities

For further information on membership or the activities of a particular club, application should be made to the person whose call-sign is indicated at the end of the item. Full addresses may be obtained from the RSGB Amateur Radio Call Book.

Grafton Field Day, 1967. Londoners out for a stroll in the sunshine on Hampstead Heath on Sunday, 2 July, were amazed to find what appeared to be some sort of communications centre on top of Tumulus Hill—there were masts, wires and tents and strange pieces of equipment all over the place. The explanation—it was the Grafton Radio Society's Annual Field Day.

There were no less than four stations in operation, with G3ONS, G3THQ and G3VUE having loaned call-signs and equipment for 160m, 4m and 2m respectively. The fourth station used the Society's own call-sign, G3AFT and its newly-acquired club rig, a KW2000A powered by a petrol generator. Each station had its own tent, except for G3ONS/P which shared a tent and table with that essential part of any Field Day, the tea makers. However, the gurgle of the kettle and the rattle of the tea-cups didn't prevent that station from having a very successful day, part of the time on a half-wave, and subsequently on an extended mobile whip. On 4m G3THQ/P found that most v.h.f. addicts had emigrated to 2m for a contest, but a number of contacts were made, and the four-element Yagi certainly attracted a lot of attention, but not so much perhaps as the six-over-six being used by G3VUE/P on 2m—this station found plenty of activity owing to the contest, but was unfortunately beset with some obscure transmitter fault, hitherto unknown. However, quite a number of contacts were made, including PA0 and ON4. G3AFT/P found DX non-existent on the h.f. bands, but the trap dipole produced plenty of inter-G contacts on 80m, while the higher frequency bands were open only for short-skip working around the Continent.

There was no shortage of operators, G2CJN, G3MFO, G3ONS, G3SIL, G3THQ, G3VUE and G3VYF all taking part—the logging being ably handled by a number of G8s and SWLs. The tents and furniture, together with a tent erection crew, were provided by the 66th North London Scout Troop, with whom Grafton now has connections.

At about 7 p.m. the chug-chug of the generator died away (in middle of a QSO of course!), the masts were gently lowered, the tents packed away, and in a short while Tumulus Hill returned to normal after what was a very successful and enjoyable day. But already there is talk of next year—gentle murmurings—" . . . pity . . . pack up at dusk . . . DX starts coming in . . . next year . . . two days . . . all night . . . generator . . . lights . . . DX . . . DX . . . DX . . . "—so who knows, perhaps next year's report will start " Londoners taking a moonlight stroll across Hampstead Heath in the wee small hours were amazed to find . . . "—but we'd better leave that till next year.

G3VYF operating G3AFT/P during Grafton Field Day.

Addiscombe ARC introduced, this month, a review of members' ex-government receivers, starting with the AR88. To be dealt with in future issues of *Spurious Emissions* will be the 19 Set, 52 Set and R1116A receivers. These reports should provide an interesting guide to any budding SWL looking for a cheap and cheerful (hardly so with the AR88!) entry to the amateur bands. *G3VYI.*

Basingstoke ARC will be entering its sixth year on 16 September and will be celebrating with the AGM. The following weekend the Club will exhibit at the local Arts and Craft exhibition in the Town Hall. The club station G3TCR will be active on all bands from 160m to 2m excluding 4m. *G3CBU.*

Belfast YMCA RC recently acquired an interesting collection of newspaper cuttings and photographs covering many of its activities dating back to 1923. They are now compiling a history scrapbook of the club, GI6YM and any information would be welcomed by GI3UFH. The winter programme commences with the AGM on 13 September and prospective members will be more than welcome any Wednesday or Saturday night. *GI3IVJ.*

Bromsgrove and District ARC recently visited the Worcestershire ARC Mobile Rally. During the event, club chairman G2CLN won the Top-Band mobile prize. Congratulations also due to Robin Bantock, now G3WNT for collecting his ticket. At the meeting on 8 September John Bratby, G3GVA, will talk on Project 66. *G3VGG.*

Cambridge and District ARC received a shock—financial not electrical—when the Eastern Electricity Board sent in its account for current used. The funds would have been well in the " red," but for the members who rallied round to support a " Bring and Buy " Sale, the proceeds of which wiped out the deficit and left a balance to the delight of the harassed Treasurer. *G5BQ.*

Civil Service RS will meet on Tuesday, 7 November when a special lecture will be given by Mr T. N. Morrison, New Zealand member of the International Communications Committee. Entitled " History of International Communication " this lecture will cover modern communication systems as we know them today starting with the laying of the first Atlantic cable. The meeting will commence at 6.30 p.m. at the Society's usual venue at the Science Museum, South Kensington. It is hoped as many people as possible will attend, whether or not they belong to any particular club. *G3KGM.*

Cornish RAC met in August when W. J. Colclough, G3XC, presented an interesting talk on the use of Private Mobile Radio. Members were surprised to learn how complex systems could become. On Sunday, 6 August the club manned an exhibition station at Ladock, New Truro on behalf of the County Scout Association. Looking towards the future, at the September meeting, G3OCB will give a descriptive talk on transistors and how they work. *G3OCB.*

Crawley ARC has been active recently preparing a new shack for the issue of G3WSC as the club call-sign. The usual preparation for V.H.F. NFD is under way and the change in rules this year are being taken advantage of by the entry of two stations. The 1968 Annual Dinner has been arranged for Friday, 23 February when it is hoped once again they will be joined by many old acquaintances. *G3FRV.*

Cray Valley RS made up a party to visit the first RSGB Mobile rally this year at Gilwell Park. (See page 592 for report). Four cars with families made up the convoy and as *they* say, a good time was had by all. Also mentioned in *QUA*—the Newsletter of the CVRS—are some interesting products dating back to 1923. How about this, a 50 ft. " Eiffel Tower " mast at £3 10s.! Or this ad from Pitmans Radio Year Book 1923.

" R.F. and H. Radio Sets give you the Dutch Concerts, Marconi Concerts, British Broadcasting and a vast amount of interesting information, weather reports, Eiffel Tower, Time Signals, Ships at Sea, etc. A Complete Outfit comprising: one 2 valve all-on or self contained Wireless Outfit in polished cabinet an improved Tuning Instrument with a waveguide range of 300 to 3000 metres, a High Tension Battery, an Accumu-

lator, an Aerial, complete with spreaders and insulators and one pair of headphones for the inclusive price of 21 Gns. And even a child can work it." *G3VLX.*

Derby and District ARS lead its newsletter with a feature on its membership. We are sure that not many clubs can quote a membership of 135 with 558 on the nominal roll. The total membership for the year ended 31 December 1966 was 174, 77 of these being licensed. At the present time the number of licensed members is 65. It can be seen that a good number of subscriptions are overdue. The success of any society regardless of size depends on a regular income.

Dorking and District RS report that after a great deal of effort by certain members, its ex-GPO van is now fully operational and it is hoped to be used to its full capacity in the coming months. Preparations are being made to ensure that the V.H.F. NFD in September will be a very successful venture. With the recent gift to the club of an LG300, it is hoped to equip the van and foster interest in c.w. At present, concern has been expressed over the strong bias within the club towards u.h.f. events and it is hoped this h.f. equipment will ease the matter. *G3MBK.*

Edgware and District RS have been closed during August with many members on holiday, but meetings will resume on 11 and 25 September. *G3FKI.*

RS of Harrow recently enjoyed lectures of topical interest. Two of the more recent were by G3CLF on solid state circuits including frequency dividers and an interesting form of s.w.r. bridge, using ferrite transformers. Another lecture was given by G3LWM whose talk was on RAEN and ended with a discussion for a possible network in the Greater London area. *G3JVM.*

Hereford ARS has been in existence for three months now and since its inception has grown to 35 fully paid up members. This is the first time for about 15 years that an amateur club has existed in Hereford and the society is naturally pleased with its growth. They meet on the First Friday each month at the Holmer Scouts Headquarters, Holmer Road, Hereford at 7.30 p.m. and will of course more than welcome any prospective members or visitors. *G3RJB.*

Ipswich RC has been quietly ticking over these last few months, working its way through a comprehensive programme of lectures. A big draw is expected to be a visit to the local brewery which will no doubt be remembered—that is by those still capable of remembering! *G3UJR.*

Manchester and District RS entertained members of the Northern Heights RS at a hamfest in the Chadderton Arms Hotel on Wednesday, 26 July. More than 40 members of the two societies had a most enjoyable evening. On Saturday, 16 September the club will be operating an h.f. bands exhibition station at a Jamboree commemorating the Diamond Jubilee of the Middleton Boy Scout Group using the call GB3MID. *G3TJX.*

Midland ARS met during August, when a Mullard film was presented. On 19 September and for the Challenge Cup a constructional contest has been arranged. Members have only just under a week to complete *that* revolutionary piece of equipment so how about it! Having a go? *G6CC.*

Northern Heights ARS put in a fair amount of time into the organisation of the local Jamboree on the Air on behalf of the Keighley Scout Group last month. Back on home territory the group also enjoyed what was apparently an excellent lecture entitled " Modern Communications in Industry." *G3MDW.*

Plymouth RC report a continued interest in v.h.f. technique and has recently added 2m equipment to the club station. It also hoped to put in an entry into this year's V.H.F. NFD held last 2-3 September. Although still suffering a little from the " summer lull " attendances are improving and a full programme of activities is planned. Of interest to most club members will be a lecture prepared by two old timers on wireless between 1902 and 1967. *G3SGV.*

Purley and District RC held its usual *natter nite* on 7 July and was well attended. RTTY was the subject of a talk given by Doug Davis, G3PAQ to 40 or so members present. Despite the holiday season both club nets, one on Top Band, the other on 70·32 Mc/s, received good support from the membership. Prospective members are invited to call in either on 1980 kc/s. Sundays or Wednesday evenings on four at 8.30 p.m. *G3FTQ.*

Reigate ATS are highly delighted with the fifth position obtained in NFD this year and a lot of merry making (!) went on at the August meeting as a result. Coupled with third position in the Affiliated Societies' Contest early this year the society is more than justified with its merriment. Further effort is being mounted for this year's V.H.F. NFD with entries on 70, 144, 432 and 1296 Mc/s. The object? beating Crawley ARC, their greatest rivals! *G3NKS.*

Wilf Whitehouse, G3SKB, Phil Connolly, G3OFH and Martin Head, G2ADW discussing a few points with Bill Bailey, G2AB, who had earlier talked on the early days of Radio Communication to the Verulam Club.

(Photo by Paul Fletcher)

Among the very many useful comments and contributions in the **Saltash and District ARC's** *Tamar Pegasus* was a simple d.c. to a.c. inverter giving 20W of mains power from 12 volts. Basically the circuit is a mains transformer with two 6 volt windings coupled with the base and collector of a single OC35 transistor adding, of course, three resistors, a capacitor and diode! No indication is given of the operating frequency although it is thought it will be low. Further information can no doubt be obtained by sending a s.a.e. to the Saltash Group, c/o I. Dawe, G3SPI, 345 Crownhill Road, Plymouth.

Spen Valley ARS held its AGM on 29 June when the following officers were elected: President—G6LD, Chairman—G3PXF, Vice Chairman—G3HPD, Secretary—N. Pride and Assistant Secretary—G3JQC. The next meeting is on 21 September when an RSGB audio-visual lecture will be presented. *G3JQC.*

Stratford upon Avon and District RC are re-starting regular fortnightly meetings this Autumn on 8 September at Hall's Croft. It is hoped to arrange a programme which will suit all interests, including a talk on the Electron Microscope on the one hand and simple theory for the SWL on the other. *G3RPJ.*

Surrey RCC now hold the unique position of being the first and only club to have won both National Field Day and V.H.F. NFD. They came top in the former this year and the latter in 1963. At a later meeting, a serious discussion was made as to the possibility of the Group producing an OSCAR package for launching. Although in its early days yet enquiries are being made. *G3KGA.*

Swindon and District ARC held a very successful mobile evening on White Horse Hill, Uffington, Berks, on 19 July. Despite the inclement weather 12 mobiles from Reading, Chippenham, Harwell and Salisbury attended. *G3JAP.*

Thames Valley ARTS has now—after several months of temporary accommodation—settled in to its new permanent meeting place, the " Cardinal Wolsey " at Hampton Court, opposite the Green. Meetings now take place on the first Wednesday of the month at 8.30 p.m. *G3JKA.*

Wolverhampton ARS met on 7 August when the Sommerkamp FL200B transmitter and FR100B receiver were demonstrated to the society by Roger Jennings, G3SOE. The general impression was that these units performed well with several contacts being made on 14 and 21 Mc/s using a rather poor aerial. *G3UBX.*

Worthing and District ARC have now obtained the club call G3WOR or G3 Whiskey Or Rum! This was first used during the third 4m Portable Contest on 23 July. During this contest the club qualified for the FMD award by working the required 26 counties and three countries, the best contacts being Cumberland and EI2. *G3LQI.*

(Continued on page 611)

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the first of the month preceding publication. A.R.s and club secretaries are reminded that the information submitted must include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Standing instructions cannot be accepted.

REGION 1

Ainsdale (ARS).—6, 20 September, 4 October, 8 p.m., 77 Clifton Road, Southport.

Allerton (Liverpool) (SRHS).—Thursdays, 8 p.m., 3rd Allerton Scout Group Headquarters, Church Road, Woolton, Liverpool.

Ashton under Lyne (AUL & DARS).—Fridays, 7 p.m., Rooms F52 and F53, Ashton College, Beaufort Road.

Blackburn (ELARC).—7 September ("Technical Topics," by G3JZO), 5 October, Mullard Film Show. 7.30 p.m., YMCA, Limbrick.

Blackpool (B & FARS).—Mondays, 8 p.m., Pontins Holiday Camp, Squires Gate. Morse tuition from 7.30 p.m.

Bury (B & RRS).—12 September, 10 October, 8 p.m. Old Boars Head Hotel, Crompton Street (private room).

Chester (C & DARS).—Tuesdays, 12 September (The Orkney Expedition Story), 19 September (Talk by G3CSG), 26 September ("Receivers and their faults," by G3EWZ), 3 October (Net Night—Top Band), 8 p.m., YMCA.

Crewe & District.—2 October, 8 p.m., 80 Albert Street.

Eccles (E & DRC).—Tuesdays, 8 p.m., Patricroft Congregational Schools, Shakespeare Crescent, Patricroft. Every Thursday Club Top Band net 20.30 hours.

Liverpool (L & DARS).—Tuesdays, 8 p.m., Conservative Association Rooms, Church Road, Wavertree.

(NLRC).—15 September ("Moon Bounce" by G3HCJ), 29 September (Junk Sale), Landbury House, 13 Crosby Road South, Liverpool 22.

UoLARS.—No more meetings until October owing to examinations.

Macclesfield (M & DRS).—12, 26 September, 10 October, 8 p.m., The George Hotel, Jordangate.

Manchester (M & DARS).—Wednesdays, 7.30 p.m., 203 Droylsden Road, Newton Heath, Manchester, 10.

(SMRC).—Fridays, 7.45 p.m., Rackhouse Community Centre, Daine Avenue, Northenden.

Morecambe.—6 September, 4 October, 125 Regent Road.

North West V.H.F. Group.—Tuesdays, 8 p.m., Club Headquarters, Chapeltown Street. Manchester, 4. 12 September, Visit by Regional Representative, G2AMV.

Preston (PARS).—7, 21 September, 5 October, 7.30 p.m. "Windsor Castle" (private room), St. Paul's Square.

St. Helens (SES).—5, 19 September, 3 October, 7.30 p.m., I.V.S. Centre, 55 College Street.

Southport (SRS).—Wednesdays, 8 p.m., and Sundays, 2.30 p.m., The Esplanade. 19 September, Visit to Southport Telephone Exchange, 8 p.m. 12 October, Visit to British Rail—Edge Hill 7.30 p.m.

(73 S.S.B. Society).—Tuesdays, 8 p.m. (all commencing with a talk on part of the RAE Syllabus), 73 Avondale Road North, Southport.

Stockport.—6 September ("Receivers," by G4HR), 20 September ("Industrial Photography," by Fred Lane), 4 October, Royal Oak Hotel, Castle Street, Edgeley.

Warrington—Culcheth (CARC).—Fridays, 7.30 p.m., The Harrow Inn, Culcheth.

Wirral (WARS).—6, 20 September, 4 October, 8 p.m., Harding House, Park Road West, Claughton, Birkenhead.

REGION 2

Barnsley (B & DARC).—8 September (AGM), 7.30 p.m., King George Hotel, Peel Street.

REGION 3

Birmingham (Bournville).—Every Friday evening, 8 p.m.

(MARS).—Third Tuesday in the month, 7.45 p.m., Midland Institute.

(South).—Third Wednesday in the month, 8 p.m., Scout Hut, Pershore Road.

Bromsgrove (B & DARC).—Second Friday in the month, 8 p.m., Co-op Hall.

Cannock (CCARS).—First Thursday in the month, Bridgtown Social Club, Walsall Road, Cannock.

Dudley (DARC).—8 September, 22 September, 8 p.m., Art Gallery, Dudley.

Hereford (HARS).—First Friday of every month, 7.30 p.m., Holmer Scout Group HQ, Holmer Road, Hereford.

Mid-Warwickshire (MWARS).—Every Monday evening, 7 Regent Grove, Leamington Spa.

Nuneaton (NARS).—Meetings fortnightly, Anchor Inn, Hartshill.

Salop (SARS).—9 September (Shrewsbury Carnival, h.f. station operating), 14 September (Sale of Surplus Equipment), 28 September (Members lecture), Old Post Office Hotel, Milk Street, Shrewsbury.

Stourbridge (STARS).—12 September ("Mobile Operation," by B. Palmer G5PP), The Library, Longlands School, Stourbridge.

Stratford (S-u-A & DRC).—Every Thursday Evening, 8 p.m., Halls Croft, Old Town.

Sutton Coldfield (SCRS).—11 September, 27 September, The Fox, Walmley.

Wolverhampton (WARS).—18 September (Discussion, "What do you want from a radio club."), 1 October (AGM), Nechells Cottage, 8 p.m.

Worcester (W & DARC).—Informal meeting each Saturday, 8 p.m., 35 Perdiswell Park, Droitwich Road, Worcester.

REGION 4

Burton-on-Trent (B-o-T & DARS).—10 September (D/F Contest—Start at Centre of Memorial Grounds, Burton. NGR SK 226250, 3 p.m.-5 p.m.), 20 September (D/F Practice—seven mile radius of centre of Netherseal, start at NGR SK 128270. 7 p.m.-9 p.m. Call-sign G3NFC/P on 1910 kc/s).

Derby (D & DARS).—6 September (Surplus Sale), 13 September (Practical Experiment), 20 September (Colour TV—Part IV), 27 September (For the Beginner—G. P. Miles, G3TOV), 23-30 September (Exhibition—Central Hall, Derby), 30 September (Annual trip to London), 1 October (President's Trophy Contest), 7.30 p.m., Room 4, 119 Green Lane, Derby.

Grimsby (GARS).—7 September (Junk Sale), 7.30 p.m., Grimsby Model Engineers Club Room, Fletchers Yard, Wellowgate, Grimsby.

Leicester (LRS).—Mondays, 7.30 p.m., Sundays, 10.30 a.m., Club Room, Gilroes Estate Cottage, Groby Road, Leicester.

Loughborough (LARC).—8 September (Surplus equipment Sale), 15 September (Construction Night—2m and 70cm converters), 22 September (Night on the air), 29 September (Mobile night out), 7.30 p.m., Club Room, Bleach Yard, Wards End, Loughborough.

Melton Mowbray (MMARS).—14 September (AGM), 7.30 p.m., St. John Ambulance Hall, Asfordby Hill, Melton Mowbray.

Newark (NSWC).—Mondays, Thursdays, 7.30 p.m., The Guildhall, Guildhall Street, Newark.

Nottingham (ARCN).—Tuesdays, Thursdays, 7.30 p.m., Room 3, Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham.

Peterborough (P & DARS).—Fridays (Informal), 8 p.m., Old Windmill, behind The Peacock Inn, London Road (opposite Murkitts Garage).

Worksop (NNARS).—Tuesdays (RAE Class), Thursdays (Lecture Night), 7.30 p.m., Club Room, 13 Gateford Road, Worksop.

REGION 5

Bedford (B & DARC).—Two meetings each month. Dates and other details from Ken Hatton, G3VBA, 49 The Briars, Kempston, Bedford.

Cambridge (C & DARC).—8 September (Informal), 15 September (Exhibition of Work by Junior Section), 22 September (Informal), 29 September (Grand Junk Sale), Fridays, 7.30 p.m., Club Headquarters, Corporation Yard, Victoria Road, Cambridge.

Luton (L & DARS).—Tuesdays, 8 p.m., ATC Headquarters, Crescent Road, Luton, Bedfordshire.

March (M & DARS).—Tuesdays, 7.30 p.m., at Old Police Headquarters, High Street, March, Isle of Ely.

Royston (R & DARC).—Wednesdays, 8 p.m., Manor House Social Club, Melbourn Street, Royston, Hertfordshire.

Shefford (S & DARS).—7 September ("Demonstration of Model Control Equipment," by Mr Hudson), 14 September ("Transistor Converters," by G3RXW), 21 September ("History of Radio," by Dr Williams), 28 September ("Top-Band Transceiver," by G3UQP). Thursdays 7.45 p.m. (Morse Classes), Meetings 8 p.m., Church Hall, High Street, Shefford, Bedfordshire.

REGION 6

Cheltenham RSGB Group.—First Thursday each month, 8 p.m., Great Western Hotel, Clarence Street, Cheltenham.

REGION 7

Acton, Brentford and Chiswick (ABCRC).—19 September (The Lafayette KT340), 7.30 p.m., Chiswick Trades and Social Club, 66 High Road, Chiswick.

Addiscombe (AARC).—12 September (Natter Night), 26 September (Junk Sale), 7.30 p.m., 158 Lower Addiscombe Road, (Toc H. Hall).

Ashford (Middlesex) Echelford (ARS).—14, 28 September, 7.30 p.m., St Martin's Court, Kingston Crescent, Ashford.

Bexleyheath (NKRS).—14 September (Film Show), 28 September (Your questions answered), 8 p.m., Congregational Church Hall, Chapel Road, Bexleyheath.

Chingford (SRC).—Fridays except first in month 8 p.m., Friday Hill House, Simmons Lane, Chingford, E4.

Chingford.—Alternate Fridays Ring SIL 5642.

Croydon (SRCC).—21 September, 7.30 p.m., Blue Anchor, South End.

Dorking (D & DRS).—12 September, 8 p.m., Wheatsheaf, 26 September, 8 p.m., Star & Garter, Dorking.

Ealing (E & DARS).—Tuesdays 7.30 p.m., Northfields Community Centre, Northcroft Road, Ealing W13.

East Ham.—First and last Thursdays, 7.30 p.m., 12 Leigh High Road, East Ham.

East London.—17 September ("Three-Legged Monsters," by Charles Meadows, G3RVV), 3 p.m., Wanstead House, The Green, E11.

East Molesey (TVARTS).—First Wednesday, 7.30 p.m., Prince of Wales, Bridge Road, East Molesey.

Edgware & Hendon (EADRS).—11, 25 September, 8 p.m., John Keble Hall, Church Close, Deans Lane, Edgware.

Gravesend (GRS).—Third Wednesday each month, 8 p.m., RAFTA Club, Overcliff Road.

Guildford (G & DRS).—8 September (Talk by G3JUL). 22 September (Talk by G3LXP/M), 8 p.m., Guildford Engineering Society in Stoke Park.

Harlow (DRS).—Tuesdays and Thursdays, 7.30 p.m., Mark Hall Barn, First Avenue.

Harrow (RSH).—Fridays, 8 September (lecture by KW or Daystrom Ltd.), 15 September (Practical Night), 22 September (Lecture), 29 September (Practical), 8 p.m., Roxeth Manor School, Eastcote Lane.

Havering (H & DARC).—13, 27 September, 7.30 p.m., Romford.

Holloway (GRS).—Wednesdays and Fridays, 7.30 p.m., Montem School, Hornsey Road.

Hounslow (HADRS).—18 September, Canteen, Mogden Main Drainage Department, Mogden Works, Isleworth.

Ilford.—Thursdays, 8 p.m., 103 Heath Road, Chadwell Heath, Romford.

Kingston (K & DARS).—Second Wednesday each month, 8 p.m., YMCA, Eden Street.

Leyton and Walthamstow.—Tuesdays, 7.30 p.m., Leyton Senior Institute, Essex Road, London, E10.

London U.H.F. Group.—First Thursday in each month, 7.30 p.m., White Hall Hotel, Bloomsbury Square, Holborn.

Loughton.—8, 22 September, 7.30 p.m., Loughton Hall (Nr. Debden Station).

Maidenhead (M & DARC).—19 September, 7.30 p.m., Victoria Hall, Cox Green, Maidenhead.

New Cross.—Wednesday and Friday, 8 p.m., 225 New Cross Road, London, SE14.

Norwood & South London (CP & DRS).—16 September (W1BB tape talk with slides), 8 p.m., CD Centre, Woodyates Road, SW12.

Paddington (P & DARS).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2a Warwick Crescent, W2.

Purley (P & DRC).—15 September, 8 p.m., Railwaymen's Hall, Side Entrance, 58 Whyteleafe Road, Purley.

Reigate (RATS).—13 September (Sale of surplus equipment), 7.30 p.m., George and Dragon, Cromwell Road, Redhill.

Romford (R & DRS).—Tuesdays, 8.15 p.m., RAFTA House, 18 Carlton Road.

Science Museum (CSRS).—3 October (Lecture and Demonstration on Hi-Fi by West & Clifford), 6.30 p.m., Science Museum, South Kensington.

Scouts (SARS).—21 September (Club Meeting), 7.30 p.m., Baden Powell House, Queensgate, South Kensington, SW7.

Sidcup (CVRS).—7 September (Mr I. Lever talks on Digital Measurement), 7.30 p.m., Church Hall, Court Road, New Eltham. 21 September (Natter Night) at All Saints Church Hall, Berta Road.
Slough (SDR Group).—First Wednesday every month, 8 p.m., United Services Club, Wellington Street.
South London Mobile Club.—9, 23 September, 7.30 p.m., Clapham Manor Baths, SW4.
Southgate & District.—8 September, 7.30 p.m., Parkwood Girls' School (behind Wood Green Town Hall).
St. Albans (Verulam ARC).—20 September ("Optical Communications," by Ian Turner, G3DGN), 7.30 p.m., Cavalier Hall, Watford Road, St. Albans.
Sutton & Cheam (SCRS).—19 September, 8 p.m., The Harrow Inn, High Street, Cheam.
Welwyn (Mid Herts ARS).—14 September (Radio Amateur Emergency Network by G3LWM & G3NRB), Welwyn Civic Centre, Welwyn Garden City.
Wimbledon (W & DRS).—8 September (Film Show), St. Johns Ambulance Hall, Kingston Road, Merton.
Wembley (GECARS).—Every Thursday, 7 p.m. This Club is open to non-GEC Employees by invitation. Telephone ARNold 1262 first. Sports Club, St. Augustin Avenue, North Wembley.

REGION 8

Crawley (CARC).—6 September ("Lasers," by J. Smith of Mullard Research Laboratories), 8 p.m., Trinity Congregational Church Hall, Ifield. 20 September (Informal), for details contact G3FRV. 27 September—Visit to RSGB Exhibition at the New Horticultural Hall.
Worthing (W & DARC).—12 September (AGM and Lucky ticket draw for Club gear).

REGION 9

Bristol RSGB Group.—Friday, 29 September, 7.15 p.m., Transport House, Victoria Street, Bristol 1.
(BARC).—Mondays and Thursdays, 7.30 p.m., 43 Ducie Road, Barton Hill, Bristol 5.
Burnham-on-Sea (B-o-SARS).—Second Tuesday in each month, 8 p.m., Crown Hotel, Oxford Street, Burnham-on-Sea.
Cornwall (CRAC).—First Thursday in each month, 7.30 p.m., Staff Recreation Hall, SWEB Headquarters, Pool, Nr. Camborne.
(CRAC V.H.F. Group).—Third Thursday in each month, 7.30 p.m., The Coach and Horses, Pydor Street, Truro.
Exeter.—First Tuesday in each month, 7.30 p.m., George and Dragon Inn, Blackboy Road, Exeter.
Plymouth (PRC).—Tuesdays, 7.30 p.m., Virginia House, Bretonside, Plymouth.
Saltash (S & DRAC).—Alternate Tuesdays, 7.30 p.m., Burraton Toc H Hall, Warraton Road, Saltash.
South Dorset (SDRS).—First Friday in each month, 7.30 p.m., Labour Rooms, West Walks, Dorchester.
Taunton.—Alternate Thursdays, 7 p.m., Lecture Theatre Taunton Technical College.
Torquay (TARS).—Last Saturday in each month, 7.30 p.m., Club Headquarters, Belgrave Road, Torquay.
Wells (WARS).—Mondays from 8 p.m., EMIE (Wells) Sports and Social Club, Chamberlain Street, Wells, Somerset.
Weston-super-Mare.—First Friday in each month, 7.30 p.m., WsM Technical College.
Yeovil (YARC).—Wednesdays, 7.30 p.m., Park Lodge, The Park, Yeovil.

REGION 10

Blackwood (ARC).—Fridays (Lecture programme with section devoted to RAE) 7.30 p.m., Blanche Cottage, off High St., Blackwood, Mon.
Cardiff (RSGB Group).—11 September. Arrangements for ORM and V.H.F. NFD. 7.30 p.m., TA Centre, Park Street, Cardiff.
Cardiff. Saturday, 16 September (ORM), 1 p.m., University College, Park Place Cardiff. See displayed Notice.
Pembroke (ARC).—Last Friday of month, 8 p.m., Defensible Barracks, Pembroke Dock.

REGION 13

Edinburgh (LRS).—14 September (Presidential Address, by A. R McWalter, GM3TSZ), 28 September (to be announced), 7.30 p.m., YMCA, 14 South St. Andrew Street, Edinburgh.

REGION 14

Ayrshire (AARG).—6, 20 September, 7.30 p.m., Seaforth House, Seaforth Road, Ayr.
Auchenharvie (A & DARS).—7, 12, 14, 19, 21, 26, 28 September, 7.30 p.m., Auchenharvie Community Centre, Stevenston.
Glasgow University (GURC).—8 September (Club Night), 22 September (Workshop Night), 7.30 p.m., Engineering North Building, University of Glasgow.
Lowland Royal Signals (ARC).—12, 19, 26 September, 7.30 p.m., 21 Jardine Street, Glasgow.
Greenock (G & DARC).—8, 22 September, 7.30 p.m. Arts' Guild, Campbell Street, Greenock.
Mid-Lanark RSGB Group.—15 September (V.H.F. Night), 7.30 p.m., YMCA, Brandon Street, Motherwell.

REGION 15

Belfast and District RSGB Group.—Third Wednesday in each month, 8 p.m., War Memorial Building, Waring Street, Belfast.

REGION 16

Basildon (BDARS).—Details from W. Borlase, BRS 27519, 24 Claverling Gardens, W. Horndon, Brentwood, Essex.
Chelmsford (CARS).—3 October (AGM and Junk Sale), 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Colchester (CARC).—Wednesdays, during term, 7 p.m., Room 40, Colchester Technical College, Sheepen Road, Colchester. Details from G3SJO.
Great Yarmouth (GYRC).—Fridays, 7.30 p.m., 98 Market Road South, Great Yarmouth.
Ipswich (IRC).—27 September (Junk Sale), 7.30 p.m., Red Cross Headquarters, Gippeswyk Hall, Ipswich.
Norwich (NARC).—Mondays, 7.30 p.m., Old Fakenham Hall, Mansfield Lane, Norwich.

REGION 17

Basingstoke (BARC).—Third Saturday in the month, 16 September (AGM), 7 p.m., Immanuel Hall, Wote Street.
Harwell AERE (ARC).—Third Tuesday in the month, 7.30 p.m., Social Club, AERE Harwell.
Maidenhead (MDARC).—First Monday in the month (Formal), Third Tuesday in the month (Informal), 7.30 p.m., Victory Hall, Con Green.
Portsmouth (P & DRS).—Wednesday, 7.30 p.m. Room 5, Twyford Avenue Community Centre, Portsmouth.
Southampton (RSGB Group).—Second Saturday in the month, 7 p.m., Engineering Lecture Theatre, Lanchester Building, The University, Southampton.

Clubroom

(Continued from page 608)

The past two months have seen plenty of activity at **Verulam ARC** with the club participating in several local events including the provision of a station at the United Nations Association Fete, where 21 Mc/s and 1·8 Mc/s were used to good effect, and a 24-hour DX set-up using the club's Quad aerial on behalf of Kings Langley Scouts during Jamboree-on-the-air. Despite the unfavourable location of the latter station and the restriction of power to 90W p.e.p. all continents were worked, including many long QSOs with VK-land and a specially enjoyable half-hour contact with a Jamboree station in DU—Phillipines.

Despite the "extra" meeting held in July when ZD9BE talked about his experiences on Tristan da Cunha a large number of members also turned out to hear "Bill" Bailey, G2QB, talk about the fascinating early days of Amateur Radio. From the time of "bright emitters" and transmissions on 400 metres Bill entertained his audiences with many amusing anecdotes and showed a much-prized QSL in the form of a letter from the ARRL confirming what must have been one of the earliest transatlantic contacts made. Renowned for his faultless c.w., G2QB showed an unusual key of his own design using two parallel piano-key contacts; one for dots and the other for dashes, based on an early railway signalling device. Of particular interest also was Bill's 400 metre wavemeter, carefully preserved from earlier days. *G3GJX.*

Newsletters were also gratefully received from the **Echelford ARS, Guildford RS, North Kent RS, RAIBC, South Birmingham RS, Swindon and District ARC** and **Wirral ARS.**

It would assist the compiler of clubroom if reports could be typed doubled spaced and concise in content. If you use longhand please print unusual words. **Deadline** for the **October issue** *was 1 September* and for the **November issue 5 October.**

CONTESTS DIARY

9-10 September	—WAEDC (phone)
10 September	—80 Metre Field Day (see page 259, April)
16-17 September	—Scandinavian Activity Contest (C.W.)
23-24 September	—Scandinavian Activity Contest (Phone)
30 Sept.—1 Oct.	—VK/ZL/Oceania Contest (Phone)
7-8 October	—Second 1296 Mc/s Contest (Open) (see page 606)*
7-8 October	—RAEN Contest (see page 465, July 1967)
7-8 October	—VK/ZL/Oceania Contest (C.W.)
7-8 October	—WADM (C.W.)
14-15 October	—RSGB 21-28 Mc/s Telephony Contest (see page 257, April)
14-15 October	—Third 432 Mc/s Contest (Open) (see page 606)*
15 October	—D/F National Final
21-22 October	—CQ WW DX Contest (Phone)
28-29 October	—RSGB 7 Mc/s DX Contest (Phone)
11-12 November	—RSGB 7 Mc/s DX Contest (C.W.) (see page 408, June 1967)
12 November	—International OK DX Contest (C.W.)
18-19 November	—Second Top Band Contest
25-26 November	—CQ WW DX Contest (C. W.)
3 December	—Fourth 70 Mc/s Contest (C.W.)

***Qualifying contests for V.H.F./U.H.F. Listeners' Championship.**

MEMBERS' ADS

These advertisements are published free of charge for the benefit of the Society's members. The number of words is limited to 30 (not including the address), and we cannot give any guarantee that an advert will appear in any specific issue. It is essential that we receive the advertisement at RSGB Headquarters by the first of the month for the following issue, and it must be accompanied by the wrapper from the previous month's BULLETIN. The address on the wrapper must, of course, agree with that in the advertisement. We cannot accept any responsibility for mistakes, but please print or type the advertisement to minimise the chances of errors being introduced.

No trade announcements can be printed here, but these can be submitted in the usual way for Classified Advertisements.

FOR SALE

Wireless Set Canadian No. 9 Mk. 1. RX/TX 1·8 Mc/s-5 Mc/s, 75W £5. Buyer collects. Mint HRO crystal filter, complete £1, p.p. 3s. Wanted information on Wavemeter Class D No. 2 No. ZA17174/1. D. F. Stechman, G3VUT, 41 Ravensbourne Gardens, Barkingside, Ilford, Essex. (Tel.: 01-550 9300).

Solartron stabilized p.s.u. 250 or 300V, 50 mA, requires case, £4. Ceramic coil formers, 2·5 in. dia., 3·5 in. winding, 7s. 6d. Wide spaced variables, 150 pF and 250 pF, 10s. each. A. R. Williams, GM3KSU, 35 Howard Place, Edinburgh 3.

CR100, recently aligned, £13. R. Threlfall, A5467, 13 Victoria Road, Whalley Range, Manchester 16.

R107, good condition, £10 o.n.o., prefer buyer inspects and collects. T. A. Moore, G3TAM, 20 Samuel Richardson House, North End Crescent, West Kensington, London, W14.

DX100U, £50; B44 Mk.3 £5 unmodified; Home built TX, three panels rack mounted, parallel 807 p.a., pp. Mod and p.s.u. £10. L. Hickingbotham, G3HZG, 95 Oakenshaw Road, Redditch, Worcs.

B2, TX section only, five coils, £2 10s. HRO with 7-14 Mc/s and 14-28 Mc/s coils, working with manual, £5. RF24 brand new 12s. 6d. plus carriage. Full details available, J. L. Reid, GW3ANU, 28 Waterston Road, Gabalfa, Cardiff, Wales.

Relays, STC sealed 2 pole changeover, 12V-24V, 700 ohm or 24V-48V 6800 ohm. Pot cores, 25mm adjustable, wound 500mH centre tapped, suit organ. 5s. each post free. M. Mann, G8ABR, Flat 71, Queens Road, Tewkesbury, Glos.

Nine valve, double conversion RX (B7G-B9A). Plug-in coils for 14-14·35 Mc/s, product detector, b.f.o., stab. oscillator, 2W 3 ohm a.f. output, 200:1 tuning ratio. Excellent working order, with p.s.u., £10, less p.s.u. £6. V. Williams, "Nant-Y-Gleisiaid," Llanbadarn Fawr, Aberystwyth, Cards.

TY2-125 and Base, £2. QQV04-15 and Base, 10s. B2 RX, £1. 1 Mc/s crystal (large), 10s. "Echo" HS-606 Lightweight headphones, 8 ohm, unused, £2. A. R. Williams, GM3KSU, 35 Howard Place, Edinburgh 3.

Eddystone EC10 RX. Excellent condition, £38. W. V. Sutton, G3GLQ, 57 Ashfurlong Crescent, Sutton Coldfield, Warks. (Tel.: 021-354 4039).

Lafayette HA-350 RX in new condition, with crystal calibrator and handbook, £40. K. L. Pietersen, 29 Roman Road, Ilford, Essex. 01-553 3420).

KW2000, a.c. and d.c. p.s.u. available. Re-aligned. Excellent condition, £155. Delivery by arrangement. W. I. B. Walker, G3RNX, 105 Coupe Lane, Old Tupton, Nr. Chesterfield, Derbys. (Clay Cross 3326).

Panda Cub transmitter, 6AC7 v.f.o., first £19. Inclusive carriage. P. B. Briscombe, G8KU, "Roseacre," Irton, Nr. Scarborough, Yorks.

70cm converter, two grounded grid r.f. stages, i.f. 28-30 Mc/s £6. Transistorized 23cm converter (G3HBW design), i.f. 26-29 Mc/s, needs aligning £5. J. Crabbe, G3WFM, 47 Torrington Drive, Potters Bar, Herts.

Collins mechanical filter new and unused, Type F455-H31, as used in RCA AR-8516L RX. Bargain at £7. J. D. Heys, G3BDQ, 418 The Ridge, St. Leonards on Sea, Sussex.

200W s.s.b. £15! Phasing rig ideal for mobile. v.f.o. tunes 80m/20m. G3TFX, 95 Pelham Road, Bexleyheath, Kent. (CY 27640).

G4ZU Minibeam £5, FT241 crystals, channels 48 (5), 47 (1), 46 (1), 45 (2), 44 (1), 43 (1), 42 (1), 0 (1), 329 (1), 4s. each or 50s. the lot. R. C. Whelan, G3PJT, 504 City Road, Birmingham 17, Warks.

TW2 TX, d.c. p.s.u., and Two-mobile RX, complete with aerial relay £37 or will separate. R. E. Short, G3GNR, 3 Park Meadow, Princes Risborough, Bucks.

Lafayette HE30 RX with matching speaker and manual £25 o.n.o. Sound "Riviera" 2 track, 3 speed tape recorder, £15 o.n.o. J. Farrar, G3UCG, "Delamar," St. Hilary, Goldsithney, Penzance, Cornwall.

Heathkit RA1 amateur bands RX with CL1 crystal calibrator, £25. J. B. Roscoe, GM4QK, 39 Letham Road, Strathaven, Lanarkshire.

Clearance of new components, s.m. capacitors, 5 per cent resistors, 100 assorted, 10s. HRO bandspread coil, 7 Mc/s, 25s. all post paid. B. E. Gee, "Magnolia House," Ravensden, Bedford.

Minimitter Top 2-7 TX, 20W 1·8, 3·5 and 7 Mc/s £12 10s. Minimitter MR44 II Amateur Bands RX £20, TW Tobmobile RX £10 10s. R. V. Southern, G3RST, The Bungalow, Steel Cross, Crowborough, Sussex.

Codar 12/MS mobile p.s.u. and 12/RC control unit with connecting cables, brand new and never used, £8 10s. D. A. Robinson, G3UQR, 75 Mount Pleasant, Clapham, Bedford (Tel.: 53466).

EAC91, EF80, 6J5, 6K7, 6N7, 6SK7, 6SM7, 7AU7, 8D3, 10C2, 10F1, 10P13, 12A6, 12AT7, 12AU7, 12BK5, 17Z3, 19Y3, 20D1, 20F2, 20L1. 10s. for six to your selection. G. A. Jeapes, G2XZ, 165 Cambridge Road, Great Shelford, Cambridge.

BC384 RX 200-500 kc/s 1·5-18 Mc/s, 2 r.f., 3 i.f. stages, crystal filter, Internal mains p.s.u. otherwise unmodified, £15, also Tobe RX, Amateur Bands 160m to 20m, requires mains transformer and choke, offers. Dr. G. H. Ungar, 14 Burcott Road, Purley, Surrey.

Eddystone 640 RX 1·75 Mc/s to 30 Mc/s in three bands. Good working order. £15 o.n.o. Will deliver up to 50 miles. R. Birkett, 40 Blencathra Street, Keswick, Cumb.

Model 7 Avometer, good condition, £10. S. A. Dale, 30 Almond Road, Dogsthorpe, Peterborough, Northants.

G3KIV QRT. 888A, S-Meter, blocks, speaker, £75, LG300 r.f., Mod/p.s.u., aerial switch, £70, DX40U, aerial switch, £25, Mohican, £20, Labgear 3 Band quad with feeders, £15, other oddments. Buyer collects. K. E. Brockway, G3KIV, 4 Benford Road, Hoddesdon, Herts.

Selling complete station, KW Vanguard, TX 80m-10m with mike, key, filters, SWR meter, minimitter MR44 RX, 160m-10m, G8KW Trap Dipole with coax feed, £60. Buyer collects. G. W. Spriggs, G3PFE, 15 Lincoln Road, Sleaford, Lincs.

G2DAF TX £30, G2DAF RX £50, the pair £70. HRO-M with five general coverage coils, £20. German type BC221, 400 c/s mod. £10. Marconi VVM £8. Vibroplex Bug, s.a.e. for details. D. A. Shepherd, G3LCS, 35 The Crescent, Haversham Estate, Wolverton, Bucks.

REE 4m Communicator mobile TX/RX as new £50 complete. Wanted US Amplifier-converter AM913/TRC 100-225 Mc/s. E. H. Page, G3HKV, 16 Abbey Street, Crewkerne, Som.

Pye 2m 25W transmitter £15. 4 element 4m J-Beam aerial £3 10s. UM3 Mod. transformer £2. Jason Wobbulator, £8. 2m Halo 10s. 813 and base, £2, postage extra. R. W. Nolan, G3KWK, Windyridge, 186 Plymouth Road, Redditch, Worcs.

Bendix TA12 four band TX, £4. 25W mod. 500V p.s.u. for same £4 each. De Luxe Joystick aerial with Type 3 a.t.u., 70s. G. Brownlow, G3WMU, 1 Widdicombe Way, Bevendan, Brighton (Tel.: 65704).

Making Space! Advance 71 v.h.f. signal generator 18-320 Mc/s, £14. CT53 sig. gen. 9-300 Mc/s, £14. Geiger counter Type 1, £5. 19 Set, £3, post extra. S.a.e. for details. R. J. Tarr, G3PUR, 81 Rectory Gardens, Worthing, Sussex.

Valves—New QV2—100, 50s. QQVO6—40, 20s. QQVO3—10, 15s. Two 3B/240M, 7s. 6d., two 100-TH, 7s. 6d. Crystals, channels 0, 44, 52, 55, 327, 3s. each. D. A. Pilley, G3HLW, 27 Oxted Rise, Oadby, Leicester. (Oadby 4714).

Swan 350 complete with p.s.u., insured, carriage, £185. LG300 offers? or exchange Vanguard 160-10m TX, HQ170, £75. Wanted EC10 will exchange for new condition Bolex cine projector. H. Jones, Burnbank, Goosewell Hill, Eggbuckland, Nr. Plymouth, Devon.

Type 68 Set RX in good condition, with brand new valves, and circuit diagram, just painted, 50s. o.n.o. B. Parsons, 39A Redditch Road, Kings Norton, Birmingham 30, Warks.

Sell or exchange Redifon G61S Ex WD 100W TX. A component goldmine, working, only exciter and p.s.u. required, for good s.w.r. indicator or Codar AT5 or cash. G. Shankie, GM3WIG, 8 Ettrick Terrace, Hawick, Roxburghshire.

Hallicrafters SX101A Mk III, one owner, un-modified in excellent condition, £120. Viceroy Mk IIIA TX with extra half lattice filter, one owner, v.g.c., £110. S. J. Heard, G3IEW, Well House, Burgmanns Hill, Lympstone, Nr. Exmouth, Devon.

Joystick Tuner Type 3A, £2. Microphone stand, 7s. 6d. Co-ax cable 4 core, 17 yds., 7s. 6d. Microphone windshield, 10s., World Radio TV Handbook, 1967, 15s. P. Ryder, 17 Abbey Road, London, N.W.8. (01-624 2938).

Telegraph Pole with fittings, supports beam at 45 ft., £5. Constant voltage transformer 250W, 230V, £2. Remote direction indicator complete, £4. All dural for 2 element 20m beam, £5. Various mains transformers 500-0-500V, 30s. each. Wanted "Z" Match and p.e.p. meter. F. Powell, G3SEL, "Wits End," Don Lane, Lower Odcombe, Yeovil, Somerset.

BC348R RX. Excellent. External audio output stage and speaker, £15. H. E. Plant, G3TJG, 171 High Street, Chasetown, Nr. Walsall, Staffs.

Vanguard TX, 160-10m, excellent condition, l.p.f., suit RAE G3—operator, will haggle around £35. G3UOL, 11 St. Patrick's Road, Coventry, Warks. (Tel.: 26476).

Rack mounted 150W 80-10m TX for sale. TVI proof and complete with a.t.u. and l.p.f., £25. D. J. Hawkins, G3PVS, "Green Patch," Lympe Hill, West Hythe, Kent (Hythe 68266).

32 ft. Galvanized Tower, Rotator and Minibeam, perfect order, unsuitable for new site. Also commercial 2m 100W TX. Buyers collect. Offers to G. G. Gibbs, G3AAZ, Coopers Close, Harmers Green, Welwyn, Herts.

AR88LF un-modified, good condition and appearance, £25. Green 2M/20 phone/c.w. TX as new, £25. Buyers collect. Exchange either for 135 mm super Takumar. A. W. Dick, G3NQU, 82 Oaken Grange Drive, Southend on Sea, Essex.

Labgear LG50, £25, HRO with p.s.u. and 8 g.c. coils, £17 10s. Z-Match a.t.u., £5, Heathkit GD1U g.d.o., £3, all tested and working, Gelose 4/102 v.f.o., untested, £1 10s., will deliver 50 miles. M. L. Luff, G3NNP, 2 Aquila Drive, Heddon on the Wall, Newcastle on Tyne 5.

Lattice mast, 32 ft., hard weatherproofed wood, transportable in four telescoping sections. Any offer. R. W. Sawyer, G3DTB, Honeywood, The Beacon, Ilminster, Somerset.

R1155 RX including 160m with p.s.u. and Handbook. Working but slight attention on MW required. Ideal for beginner or SWL. £5 plus postage. P. F. Reilly, 62 Grantham Street, Liverpool 6.

4-125A, 832A, VR150, 6AQ4, 6AN5, 6X4, 12AU7, 12A6, 6AC7, 6SC7, 6SA7, 6SK7, 6V6G, 6SQ7, 6K25, 5U4, 2X2, EF54, TT11, PT5. Offers. R. L. Edginton, G3AGF, 8 Springfield, Ashby Gardens, Kegworth, Derby.

Minimitter with SB10 (Stateside model—a good one) 440B. Approx. 5 watts on Two Metres with matching power pack. All in good condition—the lot £65. Buyer collect. S. Jackson, G3CVG, 22 Brook Road, Morecambe WE, Lancs.

Sphinx s.s.b. TX plus Delta unit as new, £55. Carriage paid. Also AR88LF RX FB condition, £30. Buyer collects. B. R. Edwards, G3RJB, 5 Powys Walk, Newton Farm, Hereford.

Marconi Valve Voltmeter TF428B/1, £15. AVO RC Bridge No. 2, £10. ATM AP66862 TU with brand new p.s.u., £9. Electrosil 50 ohm H39 dummy load, £3. Marconi TF144G signal generator, £17. T. R. Preece, G3TRP, 28 Stoneyfield Road, Old Coulsdon, Surrey.

39 Crystals from 285 kc/s to 172 Mc/s. Will exchange the lot for three crystals. 1 kc/s, 100 kc/s and 1 Mc/s. P. J. Turner, 58A Stroud Green Road, Finsbury Park, London N4.

Collins TCS-6 receiver, £3 10s. SCR522 2m transmitter, brand new, unmodified, £3. RF24 unit, modified to 10m converter (tunable), 15s. Precision multirange meter, 20,000 ohms per volt, £4. D. W. Robinson, G3FMT, 25 Hamilton Avenue, Tolworth, Surrey.

KW2000A and p.s.u., £185. KW600 linear, £90. All as new, used for only 200 QSOs. SB34 transceiver, mint, with spare set valves, £150. Hi-Z dynamic mic. and stand, unused, £3. J. L. Barry, G3UFU, 15 Fairlawn Court, London, W4.

WANTED

One s.s.b. transmitter, 180W p.e.p. "Fernbank," King Street, East Finchley, London N2.

150W Z-Match, 10-80m., incorporating SWR meter and 80 ohm dummy load, switched, in one unit, or separate units. G. Edwards, G2UX, The Bungalow, Chapel Street, Barford, Norwich, Norfolk. NOR 38X.

RSGB Bulletin, November 1960 to June 1961. *SWM* July 1959 to August 1959 and one off June 1961. R. Howe, G3PLB, 18 Vange Hill Drive, Vange, Basildon, Essex.

All parts (excluding crystals, valves and chassis) to build the G2DAF s.s.b. TX Mk. 2 using h.f. exciter. J. J. Vella, 9HIU, Mayfair, off Ursuline Street, Guardamangis, Malta.

RSGB Bulletin for January to May 1965 inclusive. S. G. Williams, G3LQI, 79 South Street, Lancing, Sussex.

Good Morse Key required. Must be of the large heavy brass type. Name your price. I. MacDonald, GM8AVM, 8 Clarence Street, Paisley, Renfrewshire.

Good secondhand RX, having sideband detector, double conversion, filters etc., NC190 or similar welcomed. A. H. Parker, G3KH, 133 Station Road, Cropston, Nr. Leicester, Leics.

Volunteer to make up "Print-Set" receiver and Mod. kit. In or near Leeds. Leeds expenses paid. H. B. Askwith, 331 Lidgott Lane, Leeds 17, Yorks.

Top-Band a.t.u. for co-ax and single wire. B44 or similar modified for mains use. B. G. Hamilton, 907 Crumlin Road, Ballysillan, Belfast 14.

TSL Type MX3 microphone with stand, preferably in new condition. Sell or exchange Varley Bridge Megger 500V, nice condition, £15 or w.h.y. All letters answered B. Price, G3MTQ, 69 Pershore Road, Edgbastion, Birmingham 5, Warks.

Circuit diagram, information for 12V 160m mobile RX and 12V p.s.u. for 888A. G. P. Gaunt, 28 Laurel Street, Middlesbrough, Yorks.

Who's Who in Amateur Radio (USA, c. 1934), *BSWL* "Review," January 1937, September 1939 to May 1941, March 1942, "CQ2," April 1945, "Radio," July 1935, *Wireless World*, May 25, 1939. F. A. Herridge, 96 George Street, Basingstoke, Hants.

HRO RX also Mobile transistor RX. For Sale 19 Set RX/TX with two p.s.u., £4. Minimitter TX 1·8 to 7 Mc/s 24W output, £18. D. Wilkinson, 35 Street Lane, Leeds 8.

Heathkit Mohican, GC1U RX in good condition. F. W. Boulton, G3JZB, Hamden, 15 Holmcroft Road, Stafford, Staffs.

Mains transformer for CR100/B28 RX. Urgent will consider buying US RX with good transformer. H. Froggatt, G3HQH, "Moncreiff," Hague Bar Road, New Mills, Stockport, Cheshire.

G2DAF type TX and/or RX for a club station. Reasonably priced one requiring some work would be considered. Also GDO. w.h.y. K. Smith, G3JIX, 82 Granville Road, Walthamstow, London, E17.

Good amateur gear will exchange extensive model railway. Will pay up to £10 for R1475 RX with p.s.u. J. E. Waters, 15A Midmoor Road, Balham, London SW12.

"S" meter for AR88D. G. Downham, 112 Stroud Road, Gloucester.

Information and modification details to convert the P40 RX from 85-95 Mc/s to 144 Mc/s. All letters answered. H. E. Willis, 111 Laburnum Road, Strood, Kent.

J. B. LOWE

51 Wellington Street, Matlock, Derbyshire

Matlock 2817 (2430 after 6)

Let's cut out the pretty pictures this month and chunter instead. (Must be full moon again !!) Needless to say, I still peddle National and Sommerkamp, but I hate ads. which never change, don't you? If the guy can't be bothered to spend half an hour making use of his advertising space, how can he be bothered to give you any service? Incidentally, talking of Sommerkamp, deliveries of the FT-100 have improved and I have managed to work through the waiting list, so at the time of writing you can have one ex stock.

National stuff is selling well—at the price it darn' well should! One thing in particular strikes me as noteworthy—practically every NCX5 I've sold (and I've sold a few ! !) has gone to a professional. By which I mean an Amateur who is also in Communications Electronics professionally. *I* know why, *they* know why. 'Nuff said. You know, it's an awful temptation sometimes to make a quick buck. Many times people's faith in me is really touching—" No, don't bother to hook it up for me, Bill. If you say it's O.K., that's good enough for me." Man, I could rob him blind! Yes sir, squeeze that extra fiver here and there and get some bread in the bank. Good reputation—cash in on it, man! Getsmart! The answer is simple—it takes a heck of a lot of satisfied customers to build up a reputation, and only one customer with a genuine moan to destroy it! Mind you, I do occasionally boob, let's be honest, but it doesn't happen often. A real dilly the other day —I had two identical oldish a.m. rigs, one having been breathed on by John was perfect. The other was an untested trade-in (" never given me a minute's trouble, Bill, old boy.") I got 'em mixed up and a customer, helluva nice guy, walked off proudly bearing the trade in. Boy, you should have heard the 'phone later that night! And was my face red ! ! P.A. tube U/S, dud 12AU7, which he replaced and then to crown it the v.f.o. shifted 5 kc/s every time he closed the key! Oh boy! Whether or not my story was believed or not, I'll never know! And as for you, " never given me a minute's trouble, Bill, old boy "—just you wait until your HQ180 needs service! I'll larn yer ! ! By the time we've lined 'er up, she'll be about as much use as teets on a Bull ! !

In spite of the odd boob, we do manage to get bouquets from time time—heard one guy on 80 tell another that " if Bill Lowe doesn't think a certain piece of gear is suited to your needs, he just won't sell it to you." Well, now, that' a real nice compliment, but I'll sell it to you if you insist. However, it won't stop me advising against it.

Enough blah for now, let's get down to the serious business of driving a wedge between you and your wallet! Coming up—a nice (I hope!) 3 band sideband transceiver at about **£120**. Tell you more when we've had a good go at it. Also, some very reasonably priced bits of test gear—an excellent VTVM for about **£10 10s.** for example. These and other odds and ends are a result of direct contact with Japan, passing on the savings to you. I will be exhibiting these and all the other new stuff I handle at the Show later this month, to which, I should add, anyone the least bit interested in radio really should not miss. Nothing like seeing what's available on the market and if any of you drop by my little piece of it you'll get a warm welcome and an opportunity to pander to my insatiable greed.

NEW:

NCX5—NATIONAL 200—SOMMERKAMP FL-200-B —FR-100-B—FT-100—LAFAYETTE HA350—HA500— HA700—CODAR EQUIPMENT—GOTHAM QUADS & VERTICALS..
KEYS—KEYERS—MICROPHONES.
ELECTRONIQUES FRONT ENDS AND I.F. STRIPS.

SECONDHAND:

DRAKE 2B and " Q " multiplier ...	£85	0	0
GREEN TMR5	£25	0	0
EDDYSTONE 840C	£35	0	0
EDDYSTONE 750	£40	0	0
EDDYSTONE 888A	£60	0	0
HAMMARLUND HQ170A	£95	0	0
HEATHKIT RAI	£35	0	0
HEATHKIT DX100U	£45	0	0
HEATHKIT DX40U	£20	0	0
STAR SR600	£65	0	0
HRO—Complete with B.S. & G.C. coils (2 sets)	£27	10	0
MARCONI HR22	£85	0	0
MINIPHASE SSB RIG	£45	0	0
R1475	£12	10	0

AND MANY MORE

BITS & PIECES:

New headsets (high or low impedance) ...	£1	1	0
Acos Stethosets	£1	1	0

Resistors and capacitors from **1d.**
Coils, **1/6d.**, trimmers **1/6d.**, feedthroughs chassis solder **5/-** dozen, screw type **10/-** dozen.
Disc ceramics 500V 0·01 **5/-** dozen, 0·001 **3/6** dozen.
Chokes **2/6**, pots **1/6**, 12V vibrators **6d.**
Variometers **5/-**, Test gear, components, etc., etc., etc. Well worth a visit.
Service: Second to none for repairs and alignment.
Trade-ins: H.P.:
Postage—Don't forget parcel post starts at 3/6d.
A large SAE will get you the latest lists.

3 de Bandit Bill, VE8DP/G3UBO.

CLASSIFIED ADVERTISEMENTS

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 to **Sawell & Sons Ltd., 4 Ludgate Circus, London, E.C.4.** Remittances should be made payable to Sawell and Sons Ltd.

SITUATIONS VACANT

AIR FORCE DEPARTMENT

ARE YOU:

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- Aged 19 or over and of good educational standard (GCE " O " level passes in English language, Maths and Physics, City and Guilds Telecommunications Technicians Certificate or equivalent qualifications are desirable though not essential).
- Experienced in radio/radar servicing.

IF SO, WE OFFER:

- A first class opening as a Civilian Radio Technician. Present salary starting at up to £1,046 p.a. (according to age), and rising to £1,201, (up to £1,076 rising to £1,242 p.a. on 1st January 1968), and good prospects of promotion (top posts in excess of £2,000 p.a.).
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- Excellent prospects of a good pension. If you do not qualify for a pension, then you receive a gratuity if you leave after at least 5 years' service.

Vacancies exist at RAF Sealand, near Chester but also arise from time to time at other RAF stations throughout the country.

Applicants should apply for further information and trade test to:
MINISTRY OF DEFENCE (CE3h(Air)
SENTINEL HOUSE
SOUTHAMPTON ROW
LONDON W.C.1.
or call at No. 30 MU Sealand between the following times:
Monday-Friday—8.30 a.m. to 4 p.m. **Saturday 8.30 a.m. to 12.30 p.m.**

Government of ZAMBIA

REQUIRES

RADIO SPECIALIST

on contract for one tour of 36 months in the first instance. Salary according to experience in scale rising from £2205 to £2275 gross per annum. A supplement of £250 per annum is also payable. Gratuity 25% of total salary drawn. Liberal leave on full salary or terminal payment in lieu. Free passages. Quarters at low rental. Children's education allowances. Outfit and plain clothes allowances. Contributory pension scheme available in certain circumstances.

The successful candidate, who will serve in the rank of Assistant Superintendent of Police, must hold the equivalent of a Diploma in technology in electrical engineering/electronics and have industrial experience in the telecommunications field, or alternatively possess lower academic qualifications but with teaching experience in telecommunications subjects up to Final City and Guilds standard combined with industrial experience. Knowledge of the techniques of S.S.B. and I.S.B. equipment, V.H.F. amplitude and frequency, modulated equipment, multiplex equipment and the construction and operation of teleprinters and low-power diesel plant preferred. Duties include lecturing and training of local officers.

Apply to CROWN AGENTS, M. Dept., 4, Millbank, London, S.W.1., for application form and further particulars, stating name, age, brief details of qualifications and experience, and quoting ref: M3D/61357/RC

NATIONAL AIR TRAFFIC CONTROL SERVICES

Radio Technicians

****

The Board of Trade has vacancies for men wanting vital and interesting work on the latest equipment in TELECOMMUNICATIONS FOR CIVIL AVIATION at Civil Airports, Air Traffic Control Centres, Radar Stations, and other Engineering Establishments.

Qualifications. Practical experience in at least one of the main branches of Telecommunications. Preference will be given to those candidates with City and Guild Certificates or O.N.C. in Engineering.

Age. 19 or over.

Salary. From £812 (at 19) to £1,046 (at 25 or over); scale maximum £1,201. From 1st January 1968 these rates will become £828 (at 19) to £1,076 (at 25 or over); scale maximum £1,242. Non-contributory pension for established staff.

Career Prospects. Radio Technicians are encouraged to study for higher technical and professional qualifications. They are helped in this by part time and, in special cases, full time release. Once qualified, there are excellent prospects of established posts and promotion to higher grades with a salary maximum of £2,174 (£3,105 from 1st January 1968).

Write for details to: Mr.T. H. Mallett, B.Sc.(Eng.) C.Eng., M.I.E.E., Room 754, The Adelphi, London, WC2, marking your envelope "Recruitment EJ 6702/**18**".

Name _____

Address _____

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Telecommunications Engineers

required by the GOVERNMENT OF MALAWI on contract for one tour of 24-36 months in the first instance. Commencing salary according to experience in scale (including overseas addition) £1,135 rising to £1,905 a year. A supplement of £100 a year is also payable. Gratuity (free of Malawi tax) 25% of total salary drawn for tour of 30 months or over or 15% for a tour of 24 but less than 30 months. Outfit allowance £30. Free passages. Liberal leave on full salary. Generous education allowances. Quarters at low rental. Contributory pension scheme available in certain circumstances.

Candidates, preferably aged 25-45 years, must have at least 5 years' experience in either of the following branches of telecommunications engineering, after completion of two years' approved training: Carrier and V.H.F. Equipment; HF Radio and A.R.Q. Equipment. They must possess at least one appropriate City and Guilds Certificate. Previous overseas experience and experience in training and supervision of subordinate staff would be advantageous.

Apply to CROWN AGENTS, M. Dept., 4, Millbank, London, S.W.1. for application form and further particulars, stating name, age, brief details of qualifications and experience, and quoting reference M3D/62648/RC.

P.L.A

VACANCIES FOR

RADIO TECHNICIANS

Vacancies exist in the above grade for shift work at Gravesend. Applicants should have a sound basic knowledge of electronics and experience in the installation and servicing of V.H.F., A.M. and F.M. communications and marine radar equipment. The ability to drive a motor vehicle would be advantageous. The most suitable age range would be between 25 and 35 years.

Average weekly earnings are £27 per week. The post will be pensionable after six months satisfactory service. Application forms should be obtained from the Establishment Officer, Port of London Authority, P.O. Box 242, Trinity Square, London, E.C.3.

INTERESTING OPENING for "Ham" exists as Assistant R.F. Heating Engineer. Job requires some ability in general engineering workshop practice, including welding and silver soldering, in addition to a knowledge of the construction of amateur transmitters. Associated with this work is a growing amount of transistor servicing. Training in any of the above skills will be given. Please write, giving full details of experience, to: R. A. Moir, Personnel Manager, Weyburn Engineering Co. Ltd., Elstead, Godalming, Surrey.

SITUATIONS VACANT—contd.

WIREMAN MECHANIC required by BBC at Birmingham premises. Duties involve installation and modification of all types of technical broadcasting equipment. Required to undertake highly-skilled work without direct supervision. Some machine shop experience an advantage. £17.15.0. per 40 hour week. Permanent pensionable post. Application forms from Engineering Recruitment Officer, Broadcasting House, London, W.1. quoting reference 67.E.4032 RSGB.

MISCELLANEOUS

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WANTED

WANTED FOR CASH. Certain types of scrap relays and contact springs from G.P.O. type relays. S.a.e. to " Lanco " 76 Sedgemoor Road, Willenhall, Coventry, Warks.

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NEWTRONICS Hustler Mobile Whip. Complete with 80 metre resonator. G3RDG, QTHR. Telephone 01-455 8831.

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HRO BANDSPREAD COILS. Your 160, 80, 40, 20 10m GC Coils modified to bandspread coverage. Working design using high grade compts. Converted by engineer. Cost per band, 25s. G3KTH, 4 Ash Drive, Catshill, Bromsgrove, Worcs.

SELLING LAFAYETTE HA230. Condition as new with manual, £15. Roth, 4 Camden Road, Somerton, Somerset.

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NPN SILICON PLANAR Expitaxial, transistors price reduction. Type P346A. TO5 case by SGS Fairchild PT, 3·0 watts; fT, 550 Mc/s, 1-9 at 5/- each, 10-24 at 4/6 each, 25-99 at 4/- each, 100 up at 3/6 each—Stoneman & Turpin Ltd., 2 The Rye, Eaton Bray, Dunstable, Bedfordshire.

S.S.B. STATION COMPLETE, K.W. Viceroy Mk. 111 with extra half-lattice filter, Dow Key relay, low pass filter, also K.W. 77 Receiver with matching speaker, £165.—G3OGB, 41 Queenborough Gardens, Ilford, Essex. Crescent 1697.

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DX'ERS . . . send for FREE QSL samples. Excellent range at right price. — Bailey & Company, Greenfield Place, Weston-super-Mare.

FET'S MPF105 suitable for 2N3819 applications, 10/-. Resistors $\frac{1}{2}$ and $\frac{1}{4}$ watt 5 per cent 4·7 ohm—4·7M 2d. each. Capacitors, rectifiers, etc. S.a.e. price list.—Student Electronic Services (G3VJU), c/o Student's Union, University of Salford, Salford 5.

EDDYSTONE EC10, perfect condition, £40. Telephone Mr Betteridge 01-580 1007 (London) 9 a.m. to 5 p.m.

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EDDYSTONE EC10 receiver for sale, mint condition £36, o.n.o.—G3UGY, QTHR or 01-769 1639.

FOR SALE (continued)

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A SALE of Surplus Second Hand Test Equipment, Signal Generators, Test Sets, Various Units and Chassis, Components, Relays, Certain Valves and Tubes, will take place at 44a, Westbourne Grove, London, W.3, on Saturday, 30th September, from 9 a.m. to 6 p.m. Nearest tube stations, Bayswater and Royal Oak. One day only.

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