MAY, 1961

# RSGB BULLETIN

VOL. 36, No. 11

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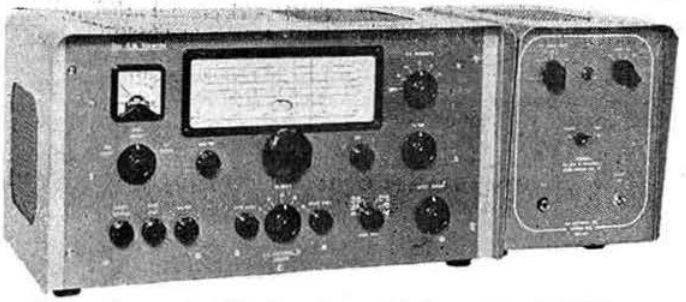

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**Volumn 36 No. 11**

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**2/6 Monthly**

# R.S.G.B. BULLETIN

## CONTENTS



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(Incorporated 1926)



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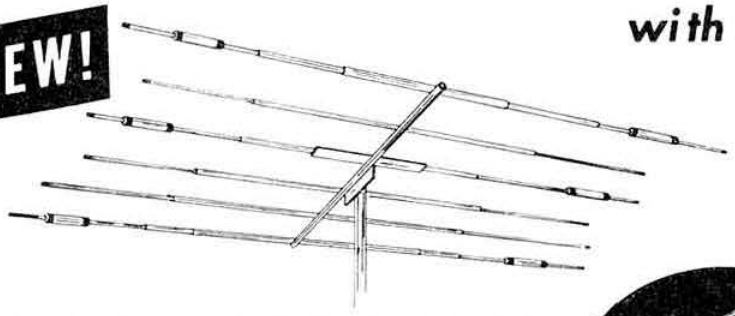

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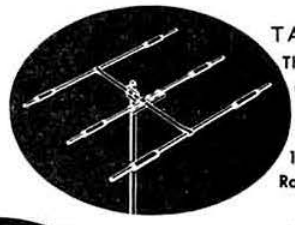

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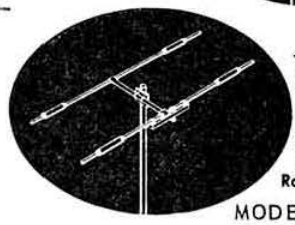

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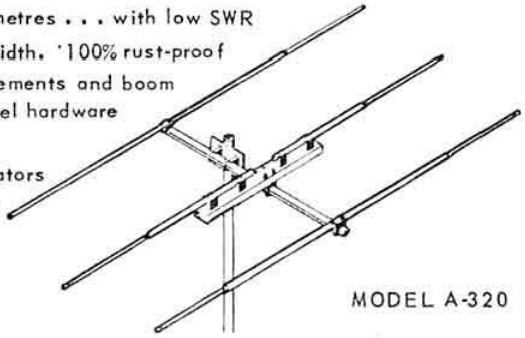

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V-4-6

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# Current Comment

*discusses topics of the day*

## *Just 38!*

FOR close on 50 years the Society has been privileged to hold lecture meetings and—until recent times—Annual General Meetings within the distinguished precincts of the Institution of Electrical Engineers on the Victoria Embankment in London. Prior to the war the lecture meetings were regarded as a " must " by most members working or living within easy reach of Central London. Attendances at that time—when the total number of members in and around the Metropolis was not more than about 500—were regularly of the order of 100, with peaks well in excess of that figure.

Times have changed indeed. Last March Mr. Norman Fitch, the energetic Honorary Secretary of the Amateur Radio Mobile Society, accepted an invitation of the Council to lecture on Mobile Operation and its Problems. There must be at least 300 mobile enthusiasts in the London Region yet the total attendance at that lecture was but 38.

Two years earlier when Dr. Smith-Rose delivered his Presidential Address there was an audience of 40—half the number that attended a local meeting in a London suburb during the week that followed the Address. Today, at least 2,000 members live or work in and around London.

What is the explanation for this complete change of outlook in respect to London lecture meetings? One possible explanation is that members now finish work at a much earlier hour than was the case before the war and are reluctant to spend an hour or so marking-time before the buffet tea—provided free, incidentally—commences at 6 p.m. Another explanation may be that a great many members have lost the art of listening to a technical lecture and need only light entertainment—in the form of television—after they have finished a day's work. A further, and possibly the best, explanation is that members who live in the suburbs of London are able to attend regular meetings in their own locality at an hour that satisfies both them as well as their families. Whatever the explanation it is a fact that the London lecture meeting appears to have lost its appeal except for the few die-hards who have attended meetings at the I.E.E. since they were " so high! "

Next month the Council has to decide whether or not application is to be made to the Institution for lecture accommodation for the session 1961-2. It will help considerably if those who consider I.E.E. lecture meetings should be continued would say so by writing a postcard to Headquarters. It would be equally helpful if members living or working in London would say why they no longer attend meetings at the I.E.E.

When we recall the epoch-making meetings, sponsored by the Society, that have taken place at the Institution of Electrical Engineers since 1914 it would indeed be a sad day if the Council finally has to put an end to an arrangement which has become part of the tradition of the Society. Yet it must surely come to that, on economical grounds alone, unless attendances can be guaranteed to increase.

## *New Publications*

AS predicted on this page in our February issue *The Radio Amateurs' Examination Manual* duly made its bow last month and in time for those who had placed an early order to study it before the Radio Amateurs' Examination took place on May 5.

If this new publication had been offered by a commercial concern the cover price would have been fixed at a figure considerably higher than five shillings but it is the policy of the Society to offer publications at as low a price as possible—a further example of the service which the R.S.G.B. provides for members, and incidentally for non-members as well.

Demands for the current edition of *A Guide to Amateur Radio* have been so great that the Council has authorized work to commence at once on yet another edition. It is pleasing to record that quite large orders for the eighth edition have been received from various Divisions of the Wireless Institute of Australia and from other I.A.R.U. Member Societies, which augurs well for the new edition of the Society's *Amateur Radio Handbook*, now in active production. It is anticipated that the new edition of this eagerly-awaited text book will appear before the end of the year but long before that time members will be given an opportunity of demonstrating their interest in and support of this important project by forwarding a pre-publication order to Headquarters.

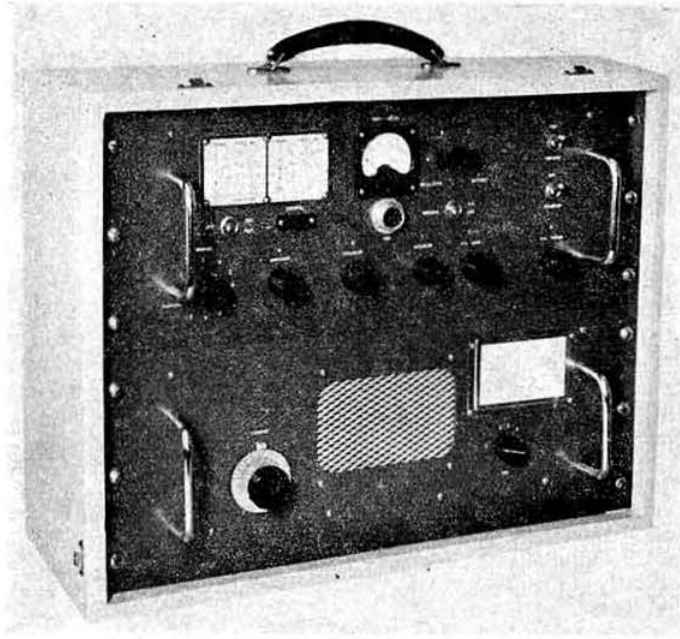
Work on the 1962 edition of the *R.S.G.B. Amateur Radio Call Book* is also well in hand and like its recent predecessors this will appear on the opening day of the Radio Hobbies Exhibition in November.

The support which the membership is giving to Society publications is most gratifying and is a complete vindication of the Council's policy of providing up-to-date technical and topical material at prices within the reach of all radio amateurs. J. C.

# A Packaged Two Metre Station

## PART I

By GEORGE STOREY (G3HTC)*



*The Packaged Two Metre Station in its wooden carrying cabinet.*

THE unit to be described in this article is a low power transmitter/receiver capable of being used as a fixed, portable or mobile 144 Mc/s station when associated with the appropriate power unit. The transmitter includes provision for operation on several channels and has full metering facilities by which its operation can be checked without need for any additional apparatus. The receiver is a single conversion superhet in order to be as simple as possible. Particular care has been taken to ensure a low noise factor and to avoid providing too much gain, as is so often the case with amateur-built receivers. Attention to these points has resulted in a receiver with an unusually low background noise and a high signal to noise ratio. While not having a high " DX potential " the receiver is more than adequate for use with its companion transmitter. As a further aid to simplicity the intermediate frequency amplifier of the receiver is based upon a modification of the surplus Amplifier Unit Type 373.

### Transmitter Circuit

The transmitter is of somewhat unusual design so far as normal amateur practice is concerned and provides an r.f. output of 5 watts to the aerial, amplitude modulated. No provision has been made for telegraphy operation since the companion receiver is not provided with a b.f.o. The r.f. section comprises a harmonic-type crystal oscillator, amplifier, two doublers and a power amplifier. The modulator consists of three voltage amplifiers driving a pair of high-slope output pentodes in push pull. The crystal oscillator is provided with ten crystals selected by a front panel switch; an eleventh position allows an additional crystal to be used when plugged into an appropriate socket provided on the front panel.

The crystals used in this transmitter are in the range 7·2-7·3 Mc/s and the overall multiplication factor is 20 times. The reason for this rather unusual feature stems from a desire to avoid as far as possible troublesome spurious output signals. It is not generally realized that no matter what precautions are taken in the construction of a transmitter there will be spurious output signals of appreciable amplitude (of the order of several microwatts) at various harmonics and, more important, at sub-harmonics of the output frequency. The author has found that the sub-harmonics which are likely to be troublesome are those at frequencies to which the tank circuits of the oscillator and multiplier stages are tuned together with the various harmonics produced by these stages. Naturally the fewer of these tank circuits there are, the fewer the frequencies at which unwanted signals will be generated by the transmitter. In addition to minimizing the number of spurious signals their frequency spacing should also be as great as possible in order to improve their attenuation by the various tank circuits which are tuned to the desired output frequency of the transmitter. To this end, the lowest frequency to which any circuit is tuned should be as high as possible, and at such a frequency that harmonics of it do not fall in or near any frequency band in which it is desired that spurious output signals from the transmitter should be at a minimum.

In the present case spurious output should be minimized in the television bands 41-67 Mc/s and 174-216 Mc/s and in the v.h.f. sound broadcasting band at 88-100 Mc/s. In the present transmitter the lowest frequency to which any tank circuit is tuned is that of the crystal oscillator at 36 Mc/s. Thus the spurious output signals from the transmitter over this range will be at 36, 72, 108, 180 and 216 Mc/s. Only one of these spurious output signals is in the bands in question—that at 180 Mc/s. However, this should not cause any serious trouble as the output at this frequency is due to the fifth harmonic ($5 \times 36 = 180$) of the first doubler stage (V3) from 36-72 Mc/s and will suffer subsequent attenuation by the tank circuits between that stage and the aerial terminals. An additional point which is an advantage of the multiplication factor used in this transmitter is that the multiplier stages both operate as doublers and so work under the most favourable multiplying conditions.

Turning to the transmitter circuit diagram of Fig. 1 it will be seen that the oscillator stage V1 utilizes an EF91 in a Colpitts circuit arrangement and employs crystals in the range 7·2 to 7·3 Mc/s. The anode circuit of this stage is tuned

* *10 Avon Road, Sunbury-on-Thames, Middlesex.*

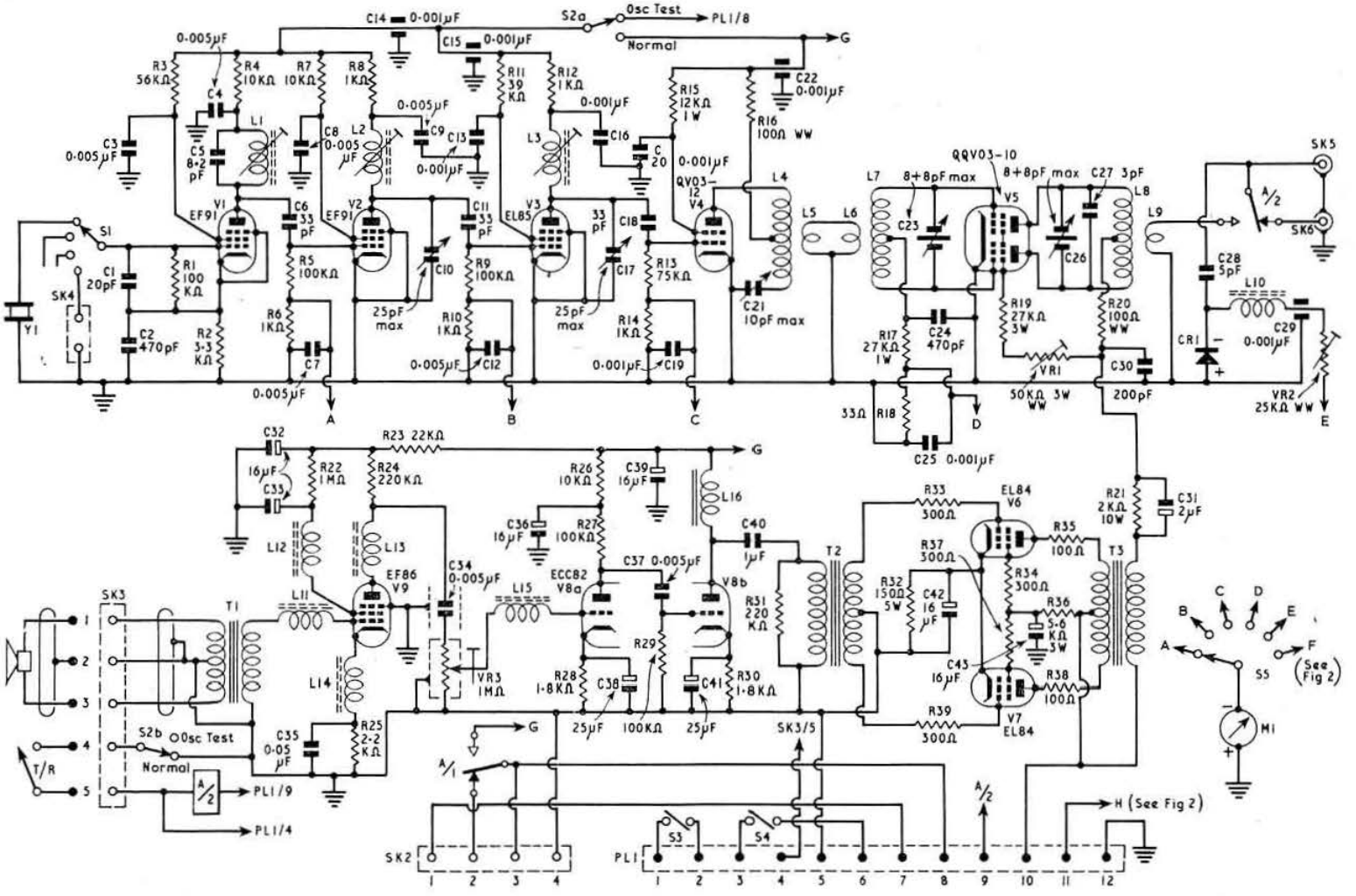



*Fig. 1. Circuit diagram of the r.f. section and modulator. All resistors are ½ watt rating unless otherwise indicated (see text). CR1, GEX66; M1, 0-1 mA m.c. meter (100 ohms coil); S1, single pole 11 way rotary; S2, d.p.d.t. toggle; S3, 4, s.p.s.t. toggle; S5, single pole 6 way rotary, break-before-make; T1, 200 ohms impedance c.t. primary to 420K ohms secondary, ratio 1:45·7 (ex-SCR522, part no. A.103014); T2, driver transformer ratio 1 : 2 c.t. (ex-SCR522, part no. A.103016); T3, modulation transformer 8K ohms c.t. to 5K ohms, ratio 1·26 : 1 approx. (ex-Collins TCS12 modulation transformer, ratio 1 : 1, is suitable).*

to the fifth harmonic of the crystals, i.e. about 36 Mc/s. Since the use of a crystal oscillator does not, simply of itself, guarantee that the output frequency of the transmitter will be stable, it is necessary to take precautions with the crystal oscillator circuit to reduce frequency drift to a minimum. To help in reducing drift the degree of feedback determined by the capacitor C2 between cathode and earth of this stage is reduced to a minimum by making it of much higher value than is normally the case. As a further aid to stability, the screen and anode feed resistors R3 and R4 are also of much higher value than usual practice dictates. The output from the oscillator is very low being of the order of 1 to 3 volts r.m.s. at the grid of the second stage (V2) which employs another EF91 and functions as a straight amplifier at 36 Mc/s. While the tuning of the anode circuit of V1 is pre-set, that of V2 is adjustable by means of a variable capacitor in order to obtain maximum drive to the first doubler stage (V3) on each channel. No useful purpose is served by increasing the output from the oscillator stage (V1) as V2 is then simply biased to a greater degree and actually produces less drive at the grid of the first doubler stage V3. The output from V2 is of the order of 60 to 100 volts as measured at the grid of V3. The doubler stage V3 uses an EL85 r.f. power pentode. This valve is specially designed for use in v.h.f. transmitters and is electrically similar to the EL91 with the exception that its efficiency has been much improved. While this particular valve is not familiar to most amateurs it is widely used in commercial v.h.f. transmitters and is readily obtainable at a low price.

Output from the first doubler stage (V3) at 72 Mc/s is coupled to the grid of the second doubler stage (V4) which is a QV03-12 and produces the drive frequency at 144 Mc/s for the final amplifier (V5), a double tetrode type QQV03-10. To improve the circuit efficiency of V4 the anode circuit is a series tuned arrangement. In using this it is important that the anode decoupling resistor R16 be of the wire-wound variety so that it acts as a v.h.f. choke. If such a resistor is not used a serious drop in drive to V5 will be experienced. The drive from the second doubler stage V4 is link coupled to the grid circuit of V5. The use of two link coupled tuned circuits between these stages gives a more efficient power transfer and at the same time improves the attenuation of spurious output signals from the drive stages. Important points in the grid circuit of V5 are that the rotor of the split stator tuning capacitor is isolated from the rest of the circuit, while the centre tap of the coil L7 is effectively earthed at r.f. by the capacitor C24. These features prevent unbalance occurring in the drive applied to the two halves of V5.

The anode tuned circuit again employs a split stator capacitor with its rotor isolated, but in this case the centre

**INDUCTOR TABLE**

| | |
|---|---|
| L1, 2 | 14 turns 32 d.s.c., 1 turn per mm.* |
| L3 | 5½ turns 18 s.w.g. tinned copper spaced wire diameter.* |
| L4 | 9 turns $\frac{3}{16}$ in. dia., 18 s.w.g. tinned copper, spaced wire dia. |
| L5, 6 | 1 turn 22 s.w.g. plastic covered around L4 and L7 respectively. |
| L7 | 6 turns $\frac{3}{16}$ in. dia., 18 s.w.g. tinned copper spaced wire dia. |
| L8 | 7 turns $\frac{3}{16}$ in. dia., 18 s.w.g. tinned copper spaced wire dia. |
| L9 | 1 turn 22 s.w.g. plastic covered around L8. |
| L10, 11, 12, 13, 14, 15, 17, 30, 31, 34, 35. | 1 amp TV supressor chokes. |
| L16 | 430H 1 mA (ex-SCR522, part no. A103034). |
| L18 | 1 turn 24 s.w.g. enam. around earthy end of L19.* |
| L19 | 5 turns 18 s.w.g. tinned copper spaced wire diameter.* |
| L20 | See text. |
| L21 | 6 turns 18 s.w.g. tinned copper spaced wire diameter.* |
| L22 | 5 turns 18 s.w.g. tinned copper spaced wire diameter.* |
| L23 | 27 turns 32 d.s.c. close wound.* |
| L24 | 4 turns 32 d.s.c. around earthy end of L23.* |
| L25 | 4 turns ¼ in. dia. 18 s.w.g. spaced wire diameter. |
| L26 | 4 turns 32 d.s.c. around earthy of 1L1. |
| L27, 28 | 10H 150 mA. |
| L29A-B, L33A-B, | 12 turns 18 s.w.g. ¼ in. dia., bifilar wound. |
| L32, | 10H 150 mA. |

* Wound on TV type formers, see text.

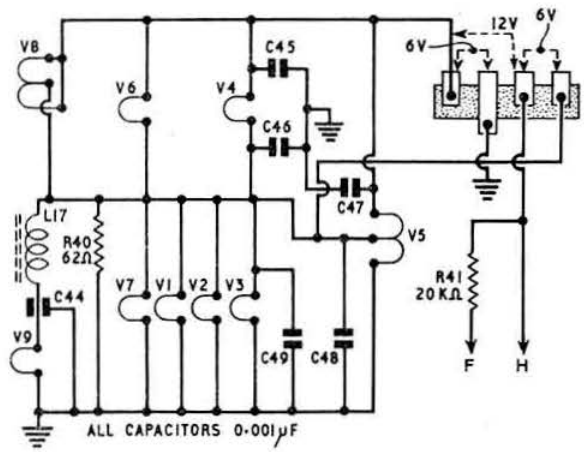



*Fig. 2. Wiring of the heaters in the r.f. section and modulator for 6 or 12 volt operation. With the value of R41 shown, M1 (see Fig. 1) reads 20 volts f.s.d.*

tap on the coil L8 is determined by the balance between the anode to cathode capacitance of the two halves of V5 when the cathode is earthed. The h.t. feed must not be decoupled at the coil and is connected through the resistor R20 which again is of the wire-wound variety to act as a v.h.f. choke. R.F. decoupling of the anode and screen feed lines of V5 is provided by the capacitor C30 which is of the mica type and must have an insulation resistance sufficient to withstand the high peak voltages to which it is subjected under amplitude modulation conditions. A capacitor rated at 1,000 volts working or greater will be satisfactory for this position. Modulation is applied to the anode and screen of V5 from the secondary of the modulation transformer T3 through a series dropping resistor R21 which is effectively shunted at audio frequencies by the capacitor C31 connected in parallel with it. The reason for placing this dropping resistor on the load side of the secondary of T3 is that the transformer is of fixed impedance ratio and it is necessary, in order to provide an accurate impedance match, to employ a higher anode voltage on the modulator valves V6, V7 than is permissible on the anode of V5. The transformer T3 has a ratio of 1 : 1, near enough to the theoretical requirement of 1·26 : 1, and is conveniently the transformer used in the Collins TCS 12.

### Modulator Circuit

The modulator comprises a pair of EL84 high slope audio pentodes V6 and V7 operating in class AB1 driven from the secondary winding of the transformer T2. The primary winding of this transformer is shunt fed from the second section V8B of an ECC82 double triode speech amplifier, the anode load of which is formed by a high inductance low frequency choke L16. In the absence of such a choke a resistor of about 100,000 ohms may be substituted at the expense of some loss of gain. The microphone amplifier stage V9 employs an EF86 low noise audio pentode and in order to prevent r.f. pick-up in this stage, it is necessary that each of its electrodes be isolated from the rest of the circuit by means of the v.h.f. chokes shown. These chokes are 1 amp television interference suppression chokes which are widely available. In connection with this stage it should be emphasized that the decoupling of the heater line to V9 as shown in Fig. 2 is particularly important. The microphone employed with this equipment is a moving coil communications type and necessitates the use of the transformer T1 which has a low impedance primary winding, centre tapped for minimizing stray hum pick-up by the microphone and its leads. If

desired a crystal microphone could be substituted and a suitable modification for this is shown in Fig. 3. However, in making this substitution it should be borne in mind that a moving coil microphone is much less critical of ambient temperature and mechanical shock, and is thus less subject to

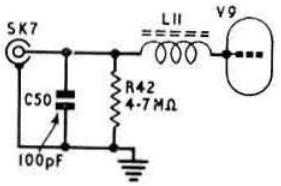



*Fig. 3. Alternative speech amplifier input for use with a crystal microphone.*

damage when the equipment is used under portable or mobile conditions. The ambient temperature inside a closed motor car in summer often rises to well in excess of 100°F and temperatures of this order will cause failure of many types of crystal microphone.

### Power Supply Switching

The switches (S3, S4) controlling the appropriate power supply are located on the transmitter as is the socket SK2 for connecting the receiver to the power supply. This enables the h.t. feed for the receiver, with the exception of that for the converter oscillator, to be switched over on transmit to the exciter and speech amplifier stages of the transmitter. A further facility which does not previously seem to have been provided on amateur v.h.f. equipment is that of enabling the selected transmitting frequency to be spotted on the receiver. For this, the switch S2 is arranged to connect the oscillator, amplifier and first doubler stages to the receiver h.t. line. This switch is also arranged to prevent the operation of the transmitter in the " TEST OSCILLATOR " position so that the later stages cannot be connected to h.t. in the absence of drive.

### Receiver Circuit

The receiver consists of two separate units, the converter and the i.f. and audio amplifiers. The converter is shown in Fig. 4 and comprises a cascode r.f. stage (V10) employing an E88CC which feeds one half of an ECC81 (V11A) functioning as a triode mixer. The operation of the mixer is improved by the high value decoupling resistor R49 which reduces the h.t. potential at its anode. The local oscillator (V11B) uses the other half of the ECC81 in a Hartley circuit arrangement.

The coils L19, L21 and L22 are tuned only by stray circuit capacities to achieve as high a gain as possible over the 2 Mc/s wide band required. Unfortunately this is achieved at the expense of a rather poor image rejection ratio but the necessary complex test equipment for setting up correctly bandpass tuned circuits at 145 Mc/s which might otherwise be employed to improve matters is available to very few amateurs. The use of a feed-through capacitor C54 for the control grid of V10B ensures a low impedance to earth. A satisfactory low impedance for proper operation of the very high gain E88CC cannot with certainty be achieved if an ordinary ceramic or mica capacitor is substituted. It was not found necessary to neutralize the r.f. stage to achieve stability. The inductor L20 serves merely to provide a slight increase in gain and to lower the noise factor a fraction; it is formed by a length of 22 s.w.g. tinned copper wire looped between pins 3 and 6 of the valveholder so that the length of conductor between the ends of the pins of V10 when it is inserted in the valveholder is about ¾ in. This length is not unduly critical. It will also be noted that the heater of V10 is isolated by the use of ferrite beads FB1-4, two on each heater lead, instead of the more usual bifilar choke, and have been found to be a very effective and convenient alternative. The heater leads of V10 are also decoupled by the feedthrough capacitors C65, C66 which are arranged physically close to the heater pins of the valveholder so that a length of plastic insulated wire between the capacitor terminal and the valveholder pin is just long enough to support the two ferrite beads. This arrangement prevents the ferrite beads from moving appreciably along the heater leads. The anode coil of the r.f. stage V10B is capacitively coupled to the grid coil of the mixer V11A by a very low value capacitor. This is formed by electrically connecting one end of an insulated wire to one terminal of L21 and wrapping its other (insulated) end around the appropriate terminal of the coil L22.

The anode circuit of the mixer is tuned to the intermediate frequency and comprises the coil L23 and the capacitor C58 which is wired directly between pins 1 and 3 of V11A. The intermediate frequency signals are coupled to the Amplifier Unit 373 by a low impedance link L24 and the plug PL9.

The local oscillator V11B has a very high value decoupling capacitor C82 (see Fig. 6) in conjunction with a high value series feed resistor R68 which effectively minimizes spurious frequency modulation of the oscillator due to ripple and noise from the h.t. supply. The injection from the oscillator to the mixer stage is by the capacitor C59 which is formed by electrically connecting one end of an insulated wire to pin 6 of V11B and having its other (insulated) end loosely looped about pin 2 of V11A.

The i.f. amplifier is based upon the Amplifier Unit 373

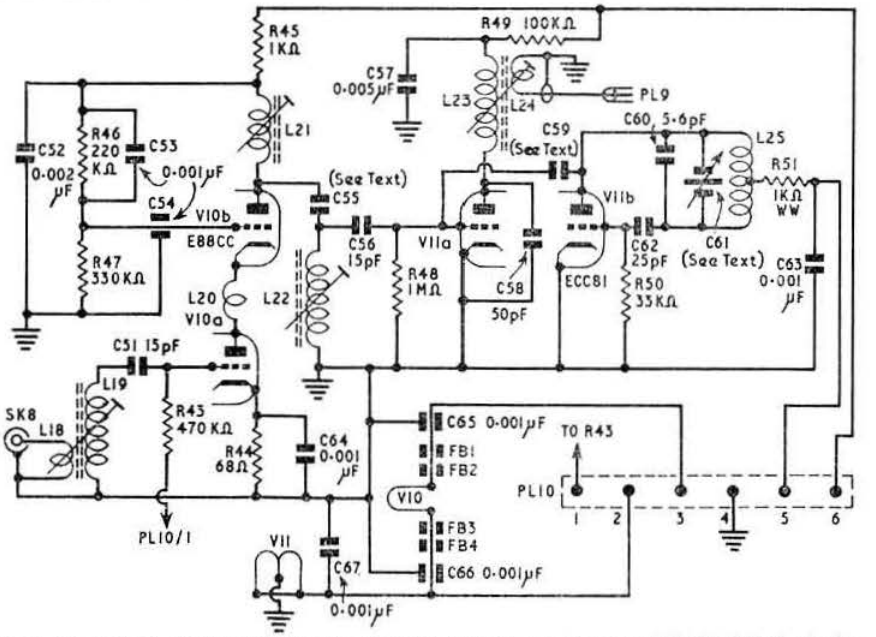



*Fig. 4. Circuit of the 144 Mc/s converter unit of the receiver. FB1-4 are small Mullard ferrite beads.*

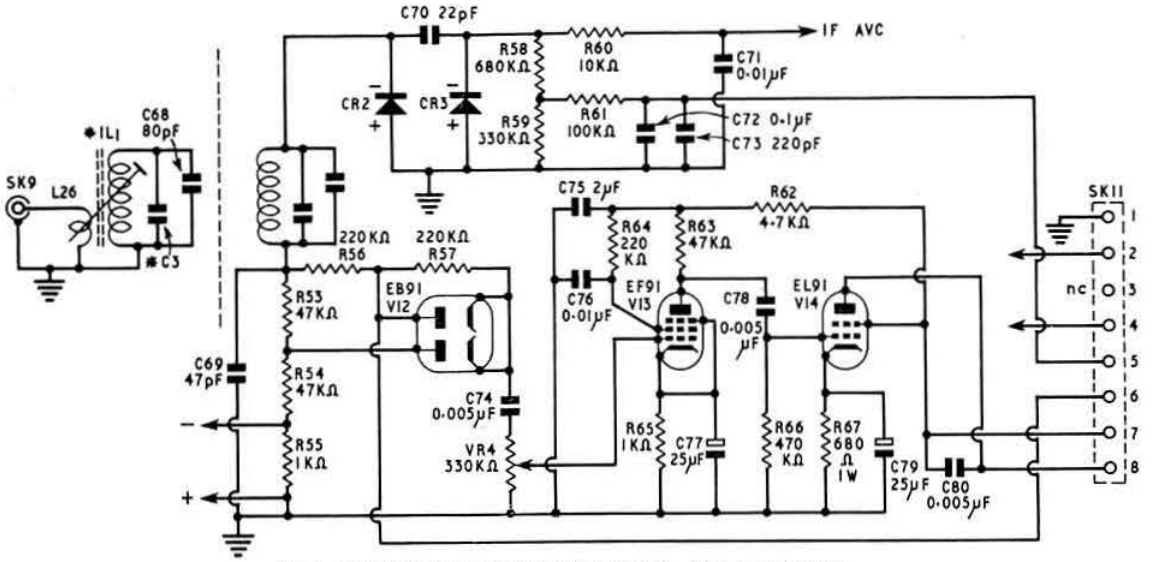



*Fig. 5. Modifications to the Amplifier Unit 373. CR2, 3, are GEX66.*

modified completely from the detector onwards, as shown in Fig. 5, and incorporating a few modifications in the earlier stages. Those in the earlier stages will be dealt with first. The input circuit of the first i.f. transformer designated 1L1 on the unit is modified to accept input by coil L26 through the low impedance link from the converter. One end of L1 is earthed and the capacitor C68 is connected in parallel with the existing capacitor C3. The coupling winding L26 consists of four turns of 32 s.w.g. d.s.c. wound around the earthy end of 1L1 and connected to SK9, the existing coaxial connector on the unit. In order to improve the gain of the amplifier unit the valves in the first two stages are replaced by 6BA6s. In making this change it is necessary to transpose the connections to pins 6 and 7 of the respective valveholders. It is further necessary to lift the cathode and suppressor grid connections on pins 2 and 7 from the chassis and re-connect them through a 68 ohm resistor in parallel with a 0·01μF capacitor to provide cathode biasing. This avoids the use of a separate bias supply as was incorporated in the equipment (TR1934 series) with which the Amplifier Unit 373 was originally used. In carrying out this operation it is important to avoid leaving the centre spigots of the two valveholders unconnected. They should be directly connected to the chassis, otherwise instability will result.

The modifications from the detector stage onwards are extensive as will be seen from the remainder of Fig. 5, and the unit is best prepared for this by removing all connections from the secondary L8 of the last i.f. transformer and the three valveholders designated V4, V5, and V6. In the modification the EB91 double diode originally present is retained as a shunt-series noise limiter, the stabilizing capacitor C81 for which is of such physical size that it is necessary to locate it outside the amplifier unit (see Fig. 6). It is connected through one of the spare terminals of the 8-way power plug which is left after the conversion. Detection and a.v.c. rectification is achieved by means of crystal diodes CR2 and CR3 simply because the Amplifier Unit 373 does not have sufficient room for the inclusion of an additional double diode. The audio amplifier utilizes an EF91, also originally present, whilst the output stage employs an EL91, the output transformer for which is again located remote from the Amplifier Unit due to restriction in size (see Fig. 6). Again connections are made through spare terminals on the 8-way power plug.

An unusual method of volume control is employed in that a resistive attenuator network R69, R70 and R71 is arranged between the secondary of the output transformer T4 and the loudspeaker. This enables the volume control S6 to be located on the front panel of the set without necessitating complicated mechanical connections to the audio gain control VR4. This attenuator network is not arranged to present a constant impedance to the output valve V14. The arrangement shown works so well in practice that the extra

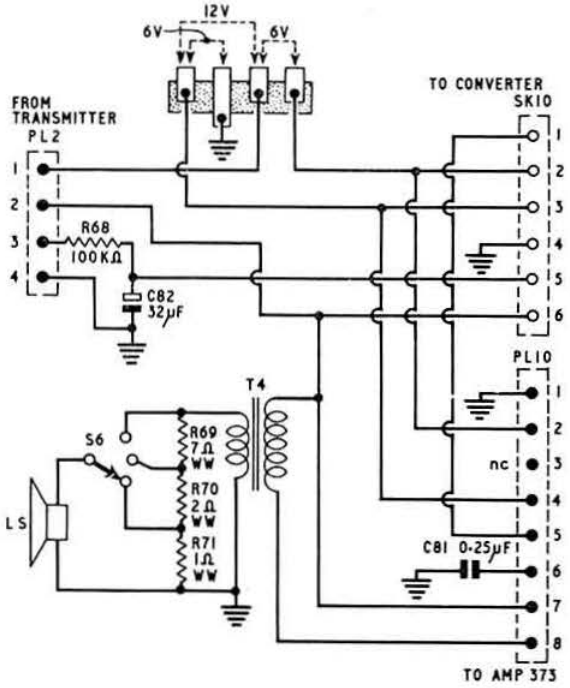



*Fig. 6. Wiring of the receiver chassis proper. S6, single pole 3 way rotary switch.*

complication of a constant impedance attenuator cannot be justified. As is common with the remainder of the equipment provision is made for operation of the heaters on either 12 or 6 volts and a modification to the original heater wiring to permit this is made by disconnecting the grey heater lead which runs from the valveholder of V4 (unit designation) through the cableform in the unit to a tag near valve V2 at the tag end and connecting it to earth. The remaining leads on this tag are connected to pin 2 of socket SK10 and the brown heater leads in the unit are connected to pin 3 of this socket.

Fig. 6 shows the only wiring on the receiver chassis proper and serves to interconnect the converter and Amplifier Unit 373 and to make the appropriate connections between them and the power plug on the transmitter and also to those components which are not conveniently mounted on either the converter or Amplifier chassis.

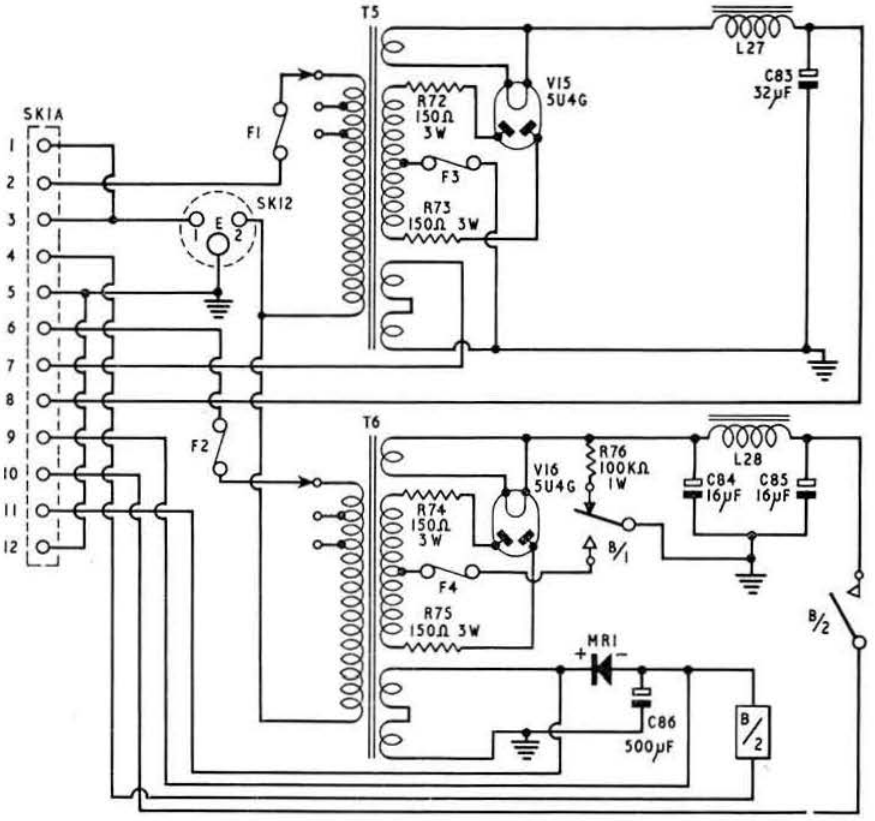



*Fig. 7. A.c. mains power supplies for home station operation of the receiver, transmitter, modulator and relays. MR1, 12 volt ½ amp. selenium rectifier; T5, 6, 200-250V. 50 c/s input; outputs 300-0-300V. 150 mA 5V. 3A, 6.3V. 3A. and 6.3V. 3A.*

## Mains Power Unit

The a.c. power supply (Fig. 7) employs two identical power transformers T5 and T6. They need not be so but the particular transformers used were available to the author at a favourable price when the equipment was built. T5 supplies power for the receiver for which the required h.t. voltage is approximately 230 to 250 volts d.c. This is obtained from the 300V secondary by using a choke input filter. T6, which supplies the transmitter filaments, relays and the h.t. for the output stages of the transmitter and modulator, is arranged to supply maximum output voltage by the use of a capacitor input filter. The inclusion of the resistors R72-R75 between the high voltage secondary windings of the transformers and the anodes of the rectifiers V15 and V16 reduces peak rectifier currents to a safe value and removes, in the case of the transmitter, the usual limit on the capacitance of the filter input capacitor C84. In order to provide single control transmit/receive switching a second relay B/2 is employed in the power unit for switching the transmitter high tension supply. The resistor R76 discharges the capacitors C84, C85 in the " receive " condition. The operating voltage for this relay, together with that in the transmitter, is derived from a half-wave rectifier MR4 associated with the transmitter l.t. supply.

**(To be concluded).**

### COMPONENT INFORMATION

*Capacitors*

C1, 2, 5, 6, 11, 18, 24, 27, 28, 30, 51, 56, 58, 62, 68, 69, 70, all mica type.
C3, 4, 7, 8, 9, 12, 13, 16, 19, 20, 25, 45, 46, 47, 48, 49, 52, 53, 57, 63, 64, 67, 89, 90, 95, 96, all disc ceramic type.
C14, 15, 22, 29, 44, 54, 65, 66, all feedthrough type.
C30, 40, 1kV working.
C31, 150V. working.
C32, 33, 36, 39, 42, 43, 450V. working.
C34, metal cased type.
C38, 41, 77, 79, 12V. working.
C60, ceramic type P100K.
C61, Eddystone type 476 with all but one fixed and two moving plates removed from each section.
C73, ceramic type.
C75, 82, 83, 84, 85, 91, 92, 350V. working.
C86, 15V. working.
C97, 600V. working.

*Fuses*

F1, 2, 2 amp.
F3, 4, 5, 6, 500 mA.

*Relays*

A/2, 2 c/o, one d.c. and one r.f., 300 ohms coil.
B/2, 2 c/o, both d.c., 300 ohms coil.
C/1, D/1, E/1, heavy duty low voltage contactors 15 amp. rating, 30 ohms coils.

*Plugs and Sockets*

PL1, 12-way chassis plug (Painton or Elcom).
PL2, 4-way cable plug (Painton or Elcom).
PL9, special co-axial cable plug from Amplifier Unit 373.
PL10, 6-way cable plug (Painton or Elcom).
PL11, 8-way chassis plug (Painton or Elcom).
SK1A, B, 12-way chassis socket (Painton or Elcom).
SK2, 4-way chassis socket (Painton or Elcom).
SK3, 5-pin screened socket.
SK4, sockets to suit crystals used.
SK5, 6, 7, 8, co-axial sockets (Belling & Lee).
SK9, special co-axial chassis socket from Amplifier Unit 373.
SK10, 6-way chassis socket (Painton or Elcom).
SK11, 8-way cable socket (Painton) on Amplifier Unit 373.
SK12, 5A chassis mounting 3-pin socket (Bulgin).
SK13, 15A chassis mounting 2-pin socket (Bulgin).

# A Sensitive Harmonic Indicator†

## *Simple Test Set for use in Television Band I*

By J. W. MATHEWS (G6LL)*

FOR some time it has been apparent that a device more sensitive than the crystal-rectifier type of harmonic indicator is needed for the detection of low level harmonics from amateur transmitters, especially in areas some distance from the local television station where the field strength is only a hundred microvolts or so.

The instrument to be described was built with the object of detecting a harmonic within the Band I TV range of frequencies of the order of 100 $\mu$V in the region of the source of the harmonic. Since this would finally be measured close to the output circuit, and before any attenuation (i.e. in the form of lowpass aerial filters or electrostatic screened link-coupled circuits), it follows that with its use it should be possible to arrange for the amount of harmonic radiation to less than say 30db down on 100 $\mu$V, that is about 3 $\mu$V or less. This should ensure that even in an area where the television field strength is as low as about 100 $\mu$V, no interference from a radiated harmonic will be caused. In practice, it should be quite possible to achieve considerably greater attenuation than the 30db taken as an example.

* *Woodlands, 90 Tolmers Road, Cuffey, Herts.*

† A revised version of an article of the same title originally published in the R.S.G.B. BULLETIN for February 1952.

It should be understood that references to the harmonic voltages detectable are only approximate and in fact the sensitivity of the device may vary considerably with individual models. The figures quoted apply to the device described but by using similar components, voltages and layout, it should be possible to repeat them within reasonable limits.

### Circuit

From the circuit diagram in Fig. 1 it will be seen that the device is merely a two stage r.f. amplifier with a diode rectifier and meter. A second diode is incorporated, with an adjustable resistance, so that the meter zero can be set in spite of the contact potential of the rectifying diode.

Since it was desired to keep the design simple, only two r.f. stages are used and no attempt has been made to obtain extremely high gain. If, in special circumstances, greater sensitivity is required, a further stage of amplification could be incorporated. For all normal purposes, however, it will be found that the sensitivity provided by two stages of medium gain is adequate. Compared with the crystal-rectifier type of indicator, the sensitivity is about 20 times greater.

A refinement is the addition of a high pass filter at the front-end before the input circuit to the first valve. This greatly reduces any possibility of overloading the first stage at the fundamental frequency of the transmitter with the consequent risk of generating harmonics of its own and thereby giving a false impression of the harmonic content of the apparatus being checked. This filter could well be an additional piece of apparatus plugged into the input coaxial socket either directly or by means of a very short length of coaxial cable. A highpass filter such as that described by D. Deacon (G3BCM) in the March 1960 issue of the BULLETIN, would be suitable and is shown as part of the circuit diagram in Fig. 1.

It will be noticed that the second r.f. stage has a standard

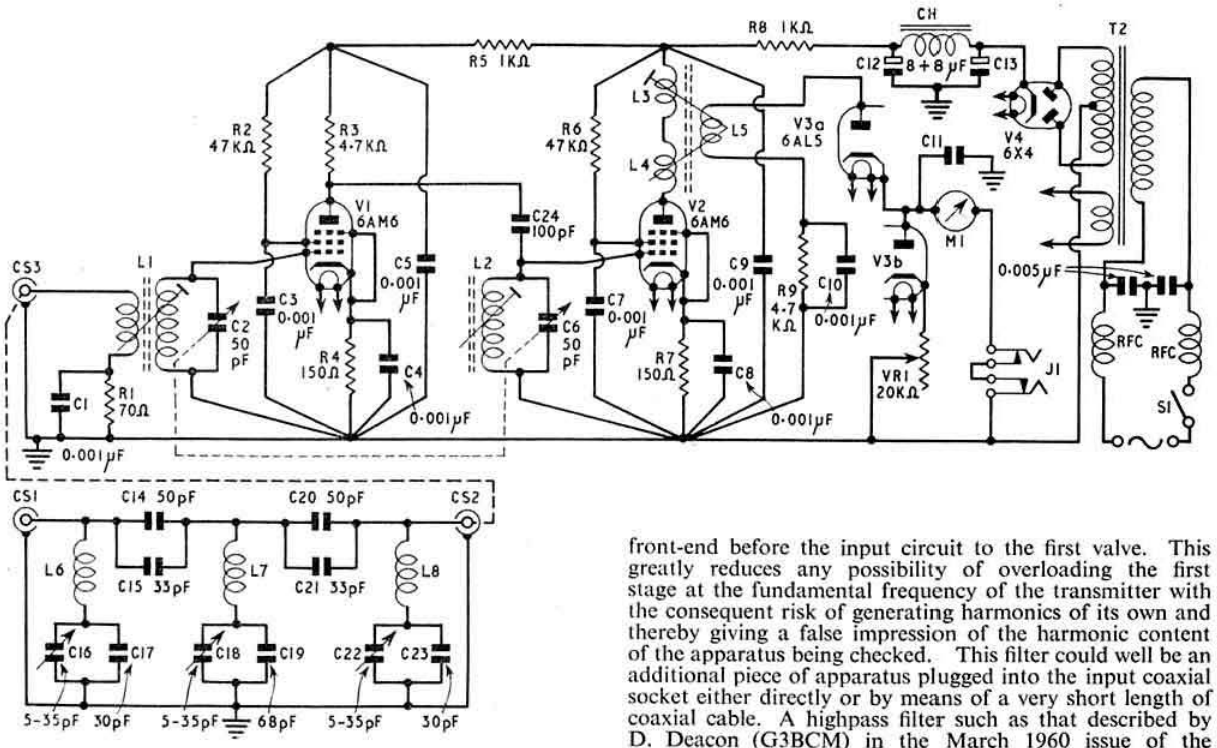



***Fig. 1. Circuit diagram of the sensitive harmonic indicator. All fixed resistors are ½ watt rating. The mains transformer is 250-0-250V 25mA, 6·3V 2A and the smoothing choke CH, 10H. The meter M1 is 0-100 μA full scale deflection.***

television type bandpass transformer (Fig. 2) in its anode circuit. This permits uniform performance over the particular television channel to which it is adjusted.

Using 50 pF ganged variable capacitors to tune the two grid circuits, the whole of Band I and the standard television i.f. band (34 to 36 Mc/s) can be covered with the coils described, but for slightly greater sensitivity on the lower frequency channels it would be better to add a turn or two and use the tuning capacitors nearer their minimum capacity.

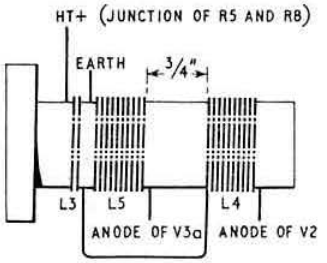



*Fig. 2. Details of the bandpass transformer L3, L4, L5. See the Coil Table for winding information.*

## Layout

The whole instrument can be self-contained in a metal cabinet with a sloping front as shown in the photograph at beginning of the article. The r.f. section occupies a chassis space of about 7 × 2 in., the remainder carrying the mains transformer, rectifier valve and smoothing choke. A suitable power supply may, however, already be available in which case connecting leads and plugs and sockets can be used. The cables should be adequately decoupled at Band I frequencies at the connectors on the instrument.

The indicating meter, together with its range switch and zero adjuster, is mounted on the sloping front thereby making observations easy. The tuning knob is on the front of the cabinet with the mains switch and panel light.

R.f. input is fed through a pick-up loop or probe attached to a short length of coaxial cable, which is plugged into the unit by means of a coaxial plug with the socket mounted on the rear edge of the chassis. If a capacitive harmonic check point from the p.a. tank circuit is provided on the transmitter itself, the unit may be connected directly to this point through a short length of coaxial cable. Such a harmonic check point consists simply of a coaxial socket connected to the aerial output of the transmitter via a 10pF capacitor. It will be found, however, that a loop-probe will be useful since it permits examination of all parts of the transmitter, including power leads and modulator leads. In the instrument described the meter has a full scale reading of 100$\mu$A, and three shunts are provided to extend the range to 500$\mu$A, 1mA and 5mA. The largest range should protect

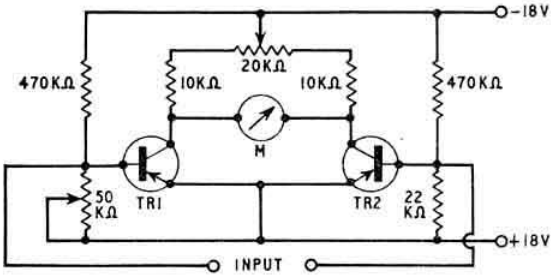



*Fig. 3. Transistor d.c. amplifier to enable a 0-1mA meter to be used in place of the 100$\mu$A instrument specified. The transistors are S.T.C. type TK41 or TS14.*

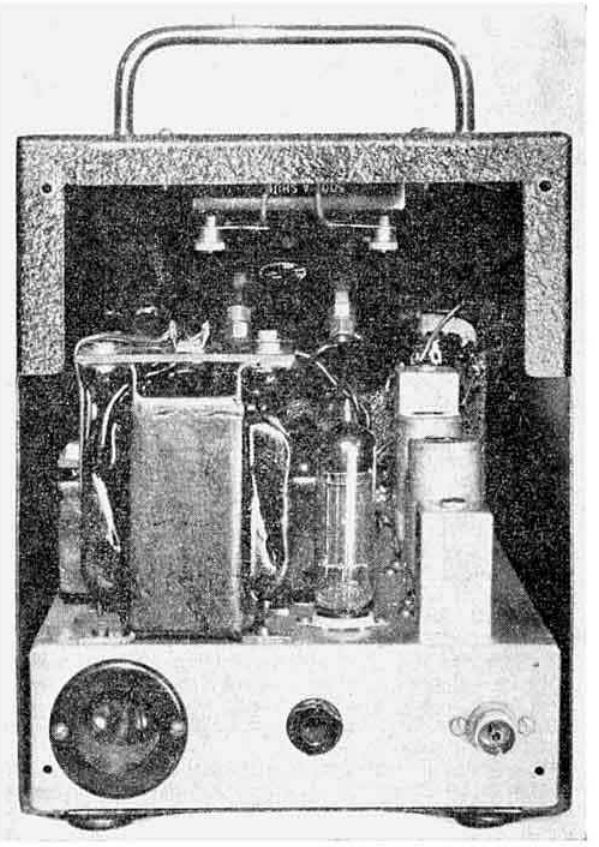
**COIL TABLE**

| | |
|---|---|
| L1 | 5 turns 26 s.w.g. spaced 1/16 in. on $\frac{1}{4}$ in. diameter dust cored former (Aladdin type PP5938). Aerial coupling coil, 2 turns wound at " earthy " end of grid coil. |
| L2 | 5 turns 26 s.w.g. spaced 1/16 in. on $\frac{1}{4}$ in. diameter dust cored former (Aladdin type PP5938). |
| L3 | 2 turns 26 s.w.g. enam. wire wound close to the end of L5. |
| L4, L5 | 10 turns 26 s.w.g. enam. wire close wound on an Aladdin former type 5937 with dust iron cores at each end. (See Fig. 2 for details of winding). |
| L6, L8 | 10 turns self-supporting 18 s.w.g. enam. wire close wound on a $\frac{3}{8}$ in. diameter mandrel (former), opened to 11/16 in. winding length. (Total length of wire required including leads $14\frac{3}{4}$ in.). |
| L7 | 6 turns self-supporting 18 s.w.g. enam. wire close wound on $\frac{3}{8}$ in. mandrel (former), opened to $\frac{1}{2}$ in. winding length. (Total length of wire required including leads $9\frac{3}{4}$ in.). |

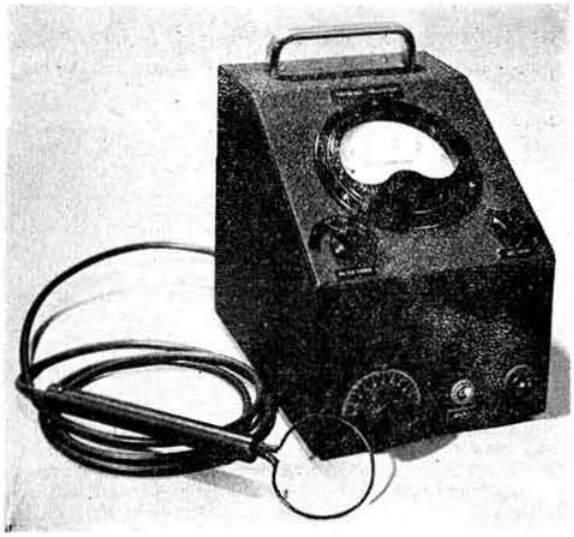
the meter from damage unless the harmonics being checked are unduly strong.

The 100$\mu$A meter could be omitted from the instrument itself and an external meter used. In such a case, a jack could be wired in place of M1 (Fig. 1). If a 100$\mu$A movement is not available a 0-1 or 0-5mA meter with a transistor d.c. amplifier built round it could be used and will give similar results. A suitable circuit is shown in Fig. 3. The 20 K ohm variable resistor is for setting the zero of the meter while the 50 K ohm variable is for gain adjustment.

No great difficulty should be experienced in the wiring,



*Looking into the instrument from the rear. Note the in-line arrangement of the r.f. stages. The mains transformer is on the left of the picture with the 6X4 rectifier in the foreground next to it. The sockets are (left to right) mains input, jack J1 and the r.f. input.*



*A view of the harmonic indicator in its cabinet which was made by E. J. Philpott's Metalworks Ltd. The tuning control is at the lower left with the on/off switch and indicator lamp to the right. The range selector switch for the meter and VR1 are on the sloping panel below the meter.*

provided the usual care associated with v.h.f. construction is followed. This includes short leads, adequate by-passing and common earth points for associated circuits. A screen should be mounted across each valveholder to ensure that the grid and anode circuits are well shielded from each other.

**Alignment**

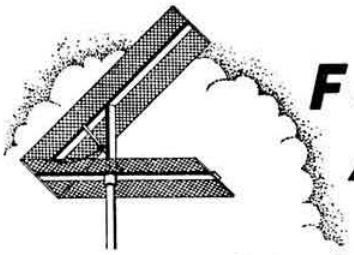
Since the device will normally only be required to work at maximum sensitivity over the channel used by the local television station, alignment is fairly simple. The instrument should be connected by good quality 70 ohm coax to a dipole resonant at the local channel frequency. Sufficient signal (for example, from a g.d.o.) should be fed in to give some indication on the meter and the cores in the coils adjusted for maximum reading. The tuning capacitor should previously be set at a point towards its minimum capacity since it is desirable to have as little capacity in the grid circuits as possible.

The bandpass transformer may next be adjusted by first connecting a resistor of 500 ohms across the secondary (i.e. the winding connected to the diode), and then trimming the primary (by adjusting the iron core) for maximum reading in the meter. The resistor should then be changed over to bridge the primary and the secondary adjusted in the same way. A final check should be made on the primary with the resistor temporarily re-connected across the secondary. The sensitivity of the indicator should now be such that only a very small signal is required to give a full scale deflection of the meter without its shunts.

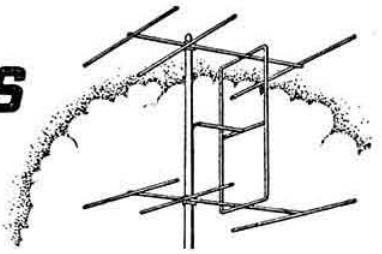
In areas not too remote from a television transmitter, it may be connected directly to a standard television aerial and a reading obtained therefrom. The headphone jack J1 in series with the meter makes it possible to listen to the signal being checked.

The time and money spent in making up an instrument of this type will be amply repaid by its usefulness. Not only is it capable of detecting transmitter harmonics, but it can also be used to check the effectiveness at television frequencies of lowpass and highpass filters as well as for their adjustment.

It could very well be constructed by a local club for the use of its members and the expense involved recovered by making a small charge for its hire.



# FOUR METRES AND DOWN



## Seventh International V.H.F./U.H.F. Convention

By F. G. LAMBETH (G2AIW)*

THE Seventh International V.H.F./U.H.F. Convention will be held at the Kingsley Hotel, Holborn, London, W.C.1, on Saturday, May 27. Once again no efforts have been spared to provide a programme well worthy of attention. Messrs. Russell and Dyott of G.E.C. are to speak on " Parametric Amplifiers " whilst Dr. Saxton will give a talk on " Satellite Communications." Arnold Mynett (G3HBW) is to relate some of his experiences of meteor scatter operations. In short, there is something for everyone, and it is hoped there will be a record gathering. All the usual attractions will be available, and the President has promised to take the chair at the Dinner in the evening.

Many interesting and valuable prizes from members of the radio trade and press have been received, for which our sincere thanks are extended.

If *you* have not already ordered your tickets please apply to G2AIW *now*.

### R.S.G.B. Beacon Station GB3VHF

G3FZL reports that the **GB3VHF** transmitter at Wrotham and the automatic receiver installed at the J-Beam Aerial Works, Northampton, are working very satisfactorily. Although the path length is about 86 miles with the transmitting aerial 1,000 ft. a.s.l., Northampton is well below the radio horizon and it has been found that the signal varies between 0·5 microvolt and something greater than 20 microvolts. Several important observations have been made. First, the signal can vary from a very low level to a high level over periods of tens of minutes. A lesson from this is that it is useless assessing conditions by a brief tune around the band; spot signal strength measurements give very little indication of the true state of conditions. Second, periods of high signal strength have been noted during the night and especially in the early morning between 06.00 and 09.00 G.M.T. The worst conditions are almost invariably experienced during the afternoon and early evening—presumably die to solar radiation causing atmospheric turbulence.

It is planned to have a display of typical signal strength records at the V.H.F./U.H.F. Convention to illustrate some of the points mentioned above. Once the transmitter had settled down it was decided to ask the B.B.C. to measure the frequency. On March 28 at 20.25 G.M.T. it was found to be 144·4994 Mc/s. This is a fine tribute to the skill of G2UJ who was responsible for grinding the crystal and measuring its final frequency. On April 18 the frequency was measured again and found to be 0·81 kc/s low. Thus it appears that the frequency can be relied upon to within 1 kc/s.

### Net Operation and the Band Plan

Turning over in his mind the recent comments in this feature about Net Operation on 2m, a member has submitted the following thoughts as a basis for discussion:

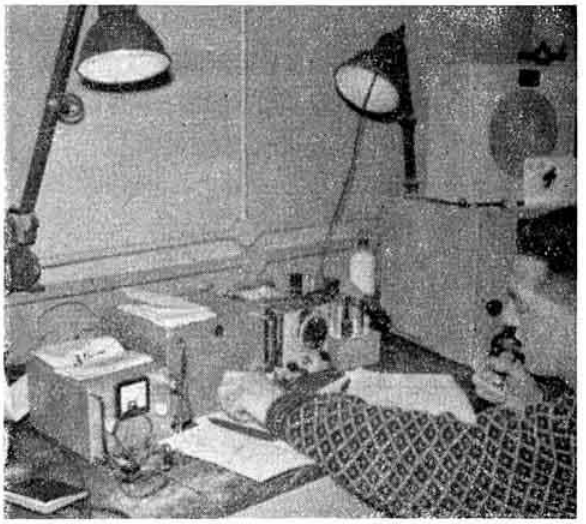
The Two Metre Band Plan has proved its value over many years for the purpose for which it was intended. By segregating groups of operators geographically and in terms of frequency it allows other groups of operators to know (a) where to point their beams and (b) how much of the 2 Mc/s bandwidth to search.

While this arrangement operates admirably when the band is open it has only limited value when the band is normal—and this is for most of the time for most of the operators. Under normal propagation conditions, therefore, occupancy is evident only in small slices of the 2 Mc/s spectrum. There are large silences in the remainder. This is not only wasteful, but a temptation to commercial operators to lay claim to these apparently unused frequencies. It is also a temptation to amateur operators to move out of congested zone allocations into the quietude of the QRM-free zones elsewhere in the band.

The self-discipline of the 2m community has been admirable in preserving the Band Plan in its present form, and any deviationary trend that might sunder it is to be deplored, when its value under DX conditions is recognized.

*Better use of the vacant spaces would ensue if more local nets were set up within them.*

Net operation on 2m must come. It is the most efficient method of radio-telephony operation. Top Band users who sensibly migrate to 2m for their local " meetings on the air "



*The GD6UW 2m station at the M.T.C.A. Radio Station on Snaefell (2,034 ft.). The equipment, left to right, comprised a Withers TW2 10 watt transmitter and power supply modulator unit, home-built i.f./a.f. section and Withers Electronics cascode converter. The CR100 receiver on the extreme right was borrowed from the Radio Station staff after a fault developed on the i.f./a.f. unit. When this picture was taken, G3MDR was operating.*

* *R.S.G.B. V.H.F. Manager, 21 Bridge Way, Whitton, Twickenham, Middlesex.*

expect to find spot-frequency techniques in operation, not the (to them) old fashioned call-and-search.

No one who read G2EC's Presidential Address can remain unmindful of his views on how inefficient much amateur communication is heard to be. Well-conducted phone operation on spot frequencies on 2m is one of many methods by which we can get ourselves out of bad-habits.

But which frequencies? The answer almost suggests itself. They must be in the upper, exclusive megacycle of the 144-146 Mc/s allocation: it would be wrong to dominate for hours on end *any* spot frequency in the lower, shared half.

If it is to be the upper half, then, the answer is further simplified by the availability of cheap surplus crystals on 8075 and 8100 kc/s. These give netting frequencies on 145·35 and 145·8 Mc/s.

The proposal therefore is that Zones 1 to 6 should use 145·8 Mc/s as their net frequency (" Southern Net ") and Zones 7-9 should use 145·35 Mc/s as *their* net frequency (" Northern Net ")—very nice for Zone 7 who have 145·35 Mc/s already! The advantages would be many:

Net operation is removed from *local* zones—and the irritation of finding a given frequency therein constantly occupied is also removed.

Any operator detecting DX coming through will be able to inform his nearest net so that they can (a) close down to remove any source of QRM and (b) muscle in on the DX! Every operator equipped with a crystal (or v.f.o.) for his local net frequency will be able to break in at any time for these purposes.

Local nets will not interfere with one another if spaced (a) in time and (b) geographically. For instance, Plymouth, Cardiff and Mid-Herts could all operate on the same frequency on the same evenings if they wanted to; Cambridge and Mid-Herts could operate on the same frequency but would need to select different nights, or different hours on the same night, say, 7 p.m. and 8 p.m. Few nets, properly conducted need last as long as an hour.

These proposals deserve to be given serious consideration as offering more effective use of the 2m allocation and of weighting the Band Plan less in favour of the few who wish only to winkle out the DX in contrast to the many who do not.

Above all, little heed should be paid to the minority outcry that is automatically triggered off from the few to whom the Band Plan is sacrosanct and inviolate. World War II would not have been won if we had stuck to biplanes!

**LONDON U.H.F. GROUP**
will meet at the Whitehall Hotel, Bloomsbury Square, London, W.C.1.
**at 7.30 p.m. on Thursday, June 1, 1961**
All v.h.f. and u.h.f. enthusiasts welcome.

## SEVENTH INTERNATIONAL V.H.F.-U.H.F. CONVENTION

**Saturday, May 27, 1961**

**Kingsley Hotel, Bloomsbury Way, London, W.C.1**

*Programme:*

| | |
|---|---|
| Convention and Exhibition of V.h.f./U.h.f. Equipment opens ... ... | 10 a.m. |
| Lectures and Technical Discussions commence ... ... ... | 2 p.m. |
| Convention Dinner ... ... ... ... | 7 p.m. |
| Presentation of Exhibition Prizes and Free Draw ... ... ... ... ... | 9 p.m. |
| Convention closes ... ... ... | 10.30 p.m. |

*Tickets may be obtained by post from F. G. Lambeth (G2AIW), 21 Bridge Way, Whitton, Twickenham, Middlesex, at the following prices: Convention only—3/6; Convention and Dinner—24/6. Bookings for the Dinner cannot be guaranteed if received later than Wednesday, May 24, 1961.*

Tube Stations: Holborn and Tottenham Court Road. Buses: 7, 8, 19, 22, 25, 38.

**Organized jointly by the R.S.G.B. V.H.F. Committee and the London U.H.F. Group.**

### Two Metre News

Conditions on 2m during the period seem to have been better than the reported results suggest. G-DX has usually been available although most signals have been under the usual strengths, but nevertheless QSOs were available on most occasions.

**G3CZZ** in Cornwall is becoming known as a consistent signal on the band, well-worth looking for. There has been little aurora—during a limited opening on April 14 **GM2FHH** was heard by **G3HBW**, but not raised.

**OK1IU** (Prague) was heard in Bilbao by EA2-79IU on October 2, 1960, on c.w.

**G2DHV/M** spent Easter weekend on the South Downs but only heard two stations during the afternoon before the accumulator went down. It seems, and was noticed also last year, that most v.h.f. activity takes place after dark, and that many operators do not really listen around the band, but go on " nattering " in QSO. Those who do should have a look round sometimes; remember the /P and /M people may be heard any time now, and that rare county may be found.

**G3BLP** (now at Woldingham) left Selsdon on March 13, having gone off the air there on March 7. At that time, the score from January 1961, was 47 counties and seven countries with the necessary cards collected (*and* delivered to Headquarters) to qualify for one of the new awards. Things are at the moment somewhat less satisfactory at Woldingham, as the aerial is temporary and the Northern DX not quite so audible as it used to be!

**G3MTI** (Malvern) wishes to thank the public spirited mobiles and portables who go about giving new counties. Those worked recently in the two categories included GW5ML/M (Breconshire), GW3FKO/P (Carmarthen and Pembrokeshire), GW4LU/M (Denbighshire and Merionethshire). Others heard but not worked were GW3BA/M (Montgomeryshire) and GW3NWR/A (Carmarthenshire). Incidentally, GW3LJP on 145·64 Mc/s is " on call " most evenings via G3MTI if anyone particularly wants Radnorshire.

**G3LSF** (nr. Ormskirk) having moved into the country can really " go to town " on 2m for the first time. The transmitter is running 15 watts to an 832A with a 6-over-6 slot beam 35 ft. a.s.l. He is looking for contacts most nights at 18.00 and 22.00 G.M.T. The path appears to be clear in all directions.

**G3HBW** is running skeds with **HG5KBP** in the hope of reaching that 21st country. No luck so far, but presumably it will be accomplished sooner or later!

**GI3OFT** (Belfast) writes that GI3CDF (Portadown) is now running 90 watts input to a 6-over-6 atop a fine 50 ft. tower. The transmitter is fully TVI proofed. At the moment he is the only 2m station in County Armagh, but will soon be joined by GI3ILV (also in Portadown), who is almost ready to go.

**GI3FJA** has a regular sked with G3CCH at 22.00 on Saturdays and has a 6-over-6 at 40 ft. He reports hearing several G stations returning to GI3GXP's CQ calls. As soon

**R.S.G.B. BEACON STATION GB3VHF**

This station is now in operation from 06.30–23.59 B.S.T. but may be on for the full 24 hours for test purposes from time to time on 144·5 Mc/s

as the news went round of the GD6UW expedition most GIs managed to squeeze into the queue for five and nine phone contacts.

Recent comments in this column have apparently had some success and several southerly overseas stations have been worked on phone after being heard calling " CQ GI."

**GM3LDU** (Clarkston) found conditions quite good during the 144 Mc/s Open Contest in March, or perhaps it was just the increased activity? The most distant contact was with G3CCH. On the Sunday morning conditions seemed at their best, and a good QSO was had with G3BW. Quite a number of G contacts were made around March 14, another good period.

**GM3LCP** (Balerno) has made his debut on the band with a four element Yagi and a nice signal.

### First Two Metre " DX " RTTY QSO

**G3IIR** (Forest Hill) reports working **G3ION** (Southampton) on April 17 over more than 60 miles. This is the first known U.K. 2m RTTY QSO apart from local workings and solid overs were achieved in spite of deep fading and a poorish path.

### Four Metres

**G8SK** mentions having heard or worked G2DD, G2AOX, G3FD, G3KI, G3CLW, G3EHY, G3EYV, G3FQS, G3HWR, G3IUJ, G3IUL, G3KMD and G6JI (from the *Lea Valley Reflector*).

**G5CP** (Chesterfield) is now active on 70·35 Mc/s with an 829B and a Labgear BiSquare aerial at the /A station which is 850 ft. a.s.l.

### First 420 Mc/s Open Contest

**G3BA** (Sutton Coldfield), reporting on the First 420 Mc/s Open Contest on April 23, says that 18 stations were on in the Birmingham area for most of the time, including G3JWQ/P, G3KPT, G3KMT/A, G3LGJ, G6XA, G3MYD/T, G3LHA/A, G2CIW, G2FNW, G3ENY, G3JZG, G2CIK/T, G3LAY, G3MXY/T, G2AFD, G3HAZ, G3KFD and G3BA. Most worked each other fairly easily. G3BA worked G6GN and GW2ATM/P and called G2XV ceaselessly but unavailingly. G3HAZ, G3KPT and others also called G2XV without result. The general summing up was that conditions were very poor and that there needs to be a great improvement in some of the receivers.

After the Contest it was learned that there was good activity in Manchester and Leeds but, although the beams had been turned on these areas, no signals had been heard. Nothing was heard from the London area either.

Most stations in the Midlands had gone to the trouble to move to the new zone, only to find that those elsewhere had not. One even asked G3BA to QSY as his converter was not so hot on 433·2 Mc/s!

### QRA Locator Map

The V.H.F. Committee will be pleased to hear from any member willing to prepare a QRA Locator Map of the British Isles. The task requires some cartographic experience.

### News from Overseas

Auroral indications were noted on various dates during March, but only on March 5, when GM2FHH, GM3BDA and LA9T were heard, and near QSOs made with the last two and March 14, 15, 19 and 27 were there any possibilities. No auroral signals were, however, heard on these latter dates on 2m.

**F3SK** has been doing a lot of experimentation on transistorized v.h.f./u.h.f. gear, and has, among other things, built an all transistor 435 Mc/s converter. This was finally done relatively cheaply, but the prototype was very expensive due to the cost of the transistors used, which have been replaced by much cheaper models. A deluxe all transistor receiver tuning 24/30 Mc/s for use with v.h.f. converters and a new 145 Mc/s converter have also been made. Some of these items may be on show at the Convention on May 27. When the transistors are available at a reasonable price F3SK is going to attack the question of a 1296 Mc/s all transistor converter.

From the *Groupe V.H.F. Atlantique Bulletin* ably edited and produced by F8TD, comes some interesting news from the French Atlantic Coast area of openings during recent weeks. G2DQ, G5TZ, G3LTF, G3HBW and G5ZG have been worked by stations in the Le Mans, St. Nazaire, Rennes, Nantes and Tours areas. An exceptional QSO was achieved by F2AU (Rennes) who worked SM5AB in what is described as a " sporadic " fashion, with strength varying between S8 and S0 and which might have been due to meteor scatter, although this is not certain.

**70 Mc/s Contest 1961**

All v.h.f. enthusiasts are reminded that this contest will be held on June 17-18. Details will be found on page 534 of this issue.

**V.H.F. QSY**

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

**Crystals Offered**

By G3NMW, 57 Lower Beeches Road, Northfields, Birmingham 31. 12,051 kc/s (B7G type).

**Crystals Required**

By G3NMW, as above. B7G type between 12,092 and 12,108 kc/s.

### Post Office Use of Satellites

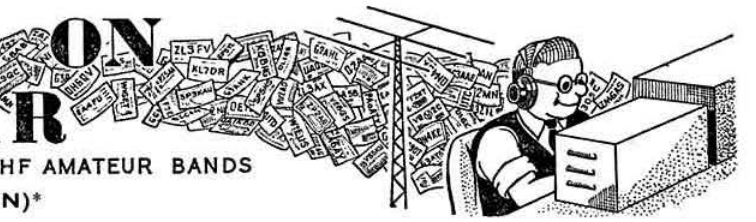
IN connection with satellite communication tests, the Post Office is to build a ground radio station with a large steerable aerial system.

## CONTESTS DIARY

| | | |
|---|---|---|
| May 28 | - | D/F Qualifying Event (Slade/Rugby) (For details, see page 534) |
| June 3-4 | - | National Field Day (For details, see page 338, January 1961) |
| June 10-11 | - | 1250 Mc/s Tests |
| June 11 | - | D/F Qualifying Event (Oxford) (For details, see page 534) |
| June 17-18 | - | 70 Mc/s Contest |
| June 25 | - | D/F Qualifying Event (Wessex) |
| July 2 | - | Second 144 Mc/s Field Day * |
| July 9 | - | D/F Qualifying Event (High Wycombe) |
| July 15-16 | - | Second 420 Mc/s Open Contest |
| September 2-3 | - | I.A.R.U. Region I V.H.F. Contest |
| September 10 | - | D/F National Final |
| September 17 | - | Low Power Field Day |
| September 30-October 1 | - | VK-ZL Contest (telephony) |
| October 7-8 | - | VK-ZL Contest (c.w.) |
| October 8 | - | R.A.E.N. Rally |
| November 11-12 | - | Second 1·8 Mc/s Contest |
| December 2-3 | - | R.S.G.B. 21/28 Mc/s Telephony Contest<br>R.S.G.B. 21/28 Mc/s Telephony Receiving Contest |
| December 3 | - | OK DX Contest |

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

# The MONTH ON THE AIR



## A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)*

WITH the continuing decline in the sunspot cycle, conditions are gradually falling into the pattern predicted for the years ahead. The figures published by the Zürich Solar Observatory show that the predicted smoothed sunspot number of 83 for April 1961 is the lowest since November 1955, and a substantial drop from the maximum figure of 201 in November 1958. Thus it is reasonable to expect that conditions on 28 Mc/s will soon be such that the paths to the South and South West will be the only ones along which DX will be worked. The North American path on 21 Mc/s will probably produce few signals, but contact with Asian countries should still be possible. Unfortunately, however, openings to Australasia and Oceania will be very few in number and poor in quality. The 14 Mc/s band will undoubtedly be the most reliable band for all round working, but the early morning and evening hours will gradually produce less and less in the shape of worthwhile contacts.

Some very interesting DX is now being worked on the 7 and 3·5 Mc/s bands but how much of this is due to changes in the sunspot cycle? The activity on these bands is rapidly increasing due to the deterioration of the higher frequencies, but propagation conditions have not radically altered. During the summer months the static level will be higher and as the cycle proceeds ionospheric absorption will be greater. It is interesting to note that whilst higher power and directional aerial systems will often aid contacts on the lower frequencies, such help will not bring results on 28 and 21 Mc/s where the M.U.F. is the determining factor.

With diminishing DX activity on 28 Mc/s it is urged that the 1700 kc/s of this band should be used to accommodate shorthaul contacts. The wide range of frequencies available and the consequent reduction in QRM, together with the ease of constructing aerial systems, make this band ideal for local QSOs.

### News from Overseas

Activity from **Aden** continues at a high level and VS9AAC provides news from this part of the world. VS9ARC, the club station at R.A.F. Khormaksar, is running 60 watts input to dipoles for various bands, whilst VS9ASP, the club station at R.A.F. Steamer Point, is at present active on 14 Mc/s only with an input of 150 watts. VS9AHH uses a DX100U, and VS9s ABA, ARP, AGD, ACS and AAI may also be heard from time to time. VS9APH is to be found usually on 21 Mc/s a.m. running 100 watts to a tribander beam, and looking for U.K. contacts. VS9AAC is active using dipoles for the three h.f. bands, with an input of 40 watts and an Eddystone receiver. Both a.m. and c.w. are employed. VS9AAC will be pleased to confirm contacts on receipt of a card from the other station, and hopes for more incoming QSLs to improve his 112 worked/51 confirmed figures.

**EP1AD** will be leaving Teheran on June 3 and returning to the U.S.A. where he will sign K4ORQ. Active behind the scenes, Hal has been largely responsible for the very favourable licensing situation now current in Iran, and as a small tribute to his work was recently elected as president of the newly formed national radio society. The new QSL manager will be EP2AF whose address will be found in *QTH Corner*.

Overseas and U.S. amateur stations are invited to participate in the **12th Armed Forces Day programme** on May 20. This features a c.w. receiving contest open to any listening station, and military to amateur transmitting and receiving tests on c.w., a.m., s.s.b. and radioteletype. The military stations will operate outside the amateur bands but will listen in the appropriate sections of these bands.

**ZC4PC**, the club station at 264 Signals Unit, is now in operation with a new DX100 which, with an AR88 and 45 ft. high aerials, should improve the radiated signals. Top Band operation is planned for next winter. ZC4CT, one of the operators at the Club station, is also active from his own QTH and awaiting a Geloso 209R.

**ZC4GT** of the Amateur Radio Club, R.A.F. Ayios Nikolaos, is active again using a DX100U and a dipole.

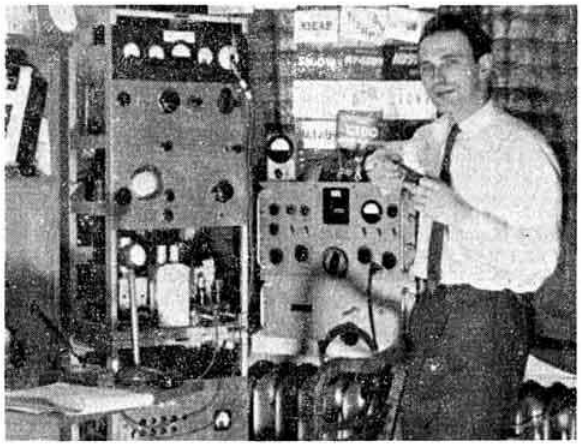
**VE3BQP**, a G now operating from Toronto, asks for assistance in contacting further counties of the U.K. So far the score is 45, and a minimum of 50 is desired. 'BQP, who is a member of the recently formed ex-G net, is active on s.s.b. and a.m. on the three h.f. bands. Surprisingly enough, amongst the counties wanted are Sussex, Oxford, Suffolk and Bedford.

It is reported that as from May 1, 1961, the following alterations in prefixes will come into force: Central African Republic—**TL8**, Congo Republic—**TN8**, Tchad Republic—**TT8**, Ivory Coast Republic—**TU2**.

From the Cocos-Keeling group VK9s BB, HC, and HX are active, together with VK9GP from Norfolk Is., VK9DJ from Nauru and VK0FZ from MacQuarie Is. All these stations have been on c.w. on 14 Mc/s.

### DXpeditions

**EI0AB** will be operating from the **Aran Islands** during the period 15.00 May 20 to 12.00 May 22. Continuous operation on c.w., a.m. and s.s.b. on 21, 14 and 7 Mc/s is planned. Stations should call 10 kc/s above or below the operating



*Andrew Gamdzyk, SP5PO, the first, and for a long time the only s.s.b. operator in Poland. With a home-built filter exciter and a ground plane aerial Andrew radiates a potent signal from his home near Warsaw.*

* *Please send all reports to R.S.G.B. Headquarters to arrive not later than May 19.*

*Bill Wilkinson (B.R.S.20317), of Bromley, Kent, one of the most consistent listener-reporters to M.O.T.A.*

frequency. QSLs should be sent to EI6X, whose QTH is correct in the *Call Book*. Cards will be sent out via the Bureau unless return postage is enclosed. The operators will be those who made the trip to the Blasket Islands last year.

During the first week of June OD5CT and HB9TL will be operating as **9K4A** from the Neutral Zone adjoining Kuwait.

**PK1SX** is expected to commence operation in June, and has obtained F.C.C. approval for his activity. The home call of the operator is K3HVN, and his wife will be acting as QSL manager.

**G3JFF/VS1HU** will be operating under the calls 9M2MA, VR2MA, VR1M and VR4M during the next fifteen months. The tentative schedule is VR2 from June until August; VR1 August to November; VR1 February 1962 to April, and VR4 during May 1962. G3JFF is a radio supervisor on board *H.M.S. Cook*, a R.N. survey vessel. Mail may be addressed to *H.M.S. Cook*, c/o FMO, Far East. G3LCS (ex-VS1HQ), the source of this information, mentions that he is still chasing a VS1 DXCC three years after leaving Singapore, and outstanding QSLs will be most welcome.

From G3NAC it is learnt that the R.A.F.A.R.S. plan a sizeable DXpedition during the month of October. The venue is not yet finally settled but will probably be **FL8.** Activity on c.w., a.m. and s.s.b. is promised.

**6W8CB/MM** is the call used by the 27 ft. yacht *Danae II* now on a round the world trip lasting three or four years. The transmitter used is a 50 watt home built unit for a.m. and the receiver a BC312. Their voyage will take them through the West Indies and into the Pacific via the Panama Canal. An attractive QSL is distributed by K0GZN.

The trip to the **Isle of Man** by the Cambridge University Wireless Society from April 5 to 12 was highly successful and 550 contacts were made on the h.f. bands, together with some 100 contacts on 1·8 Mc/s. Most of the activity was on c.w. and on 14 Mc/s. The operators (G3s MDR, NHL, OBT and OSU assisted by SWL I. Sykes) plan to make another trip next year.

Some details of the recent trip to **Malpelo Island,** where operation under the call sign **HK0TU** took place, have now come to hand, and it appears that the equipment was pulled to the island in steel barrels. This is not exceptional in itself but it should be added that the operators first got on to the island by swimming! Only by seeing a picture of this large rock can the difficulties of the members of the DXpedition be appreciated. The equipment was housed in small caves some 200 ft. above sea level, but it was found impossible to erect the aerials on the top of the island, and screening in certain directions was very bad. The actual operating was first class and all members of the expeditions are to be congratulated on their efforts.

QSLs from VU2NRM and AP2CR (East Pakistan) have been distributed, the latter being an especially attractive presentation.

The Russian portable s.s.b. rig is still on its travels and operation from **UA2AO** and **UO5PK** will take place in the near future. The UA3FE/0 QSLs have been distributed through the Bureaux.

It is not known from where the information originated, but the QSL address given for cards for **KH6ECD** and disseminated throughout the world was incorrect. The addressee should have been Lt.-Com. W. M. M. Robinson, **(KM6BQ),** Navy 3080, Box 3, F.P.O., San Francisco, Calif., U.S.A. It is understood that all cards sent to KM6BI will in fact be sent on to the correct recipient so all should be well. QSLs will not be mailed before the latter half of May at the earliest.

**ZD1ES,** operated by ZS3ES, appeared on s.s.b. from Sierra Leone, and QSLs should be sent to the Ontario

## QTH Corner

| | |
|---|---|
| **DL2ZN** | Tpr. Quigley D., S.M.C. Branch, H.Q. B.A.O.R., B.F.P.O. 40. |
| **DU1SA** | 1569 Espana, Sempaloc, Manilla, Philippine Is. |
| **EP QSL Bureau** | R. Sanderson, U.S. Embassy, A.P.O. 205, U.S. Armed Forces. (outside U.K.: A.P.O. 205, N.Y., U.S.A.) |
| **F.E.A.R.L. (KA)** | A.P.O. 925, San Francisco, Calif., U.S.A. |
| **FF4AL** | via K3KVQ. |
| **FQ8HB** | J. Fees, B.P. 1132, Pointe-Noire, Rep. du Congo. |
| **HK0TU** (revised) | Edmundo Quinones (HK3LX), Carrera 27, 70-89, Bogota, Columbia. |
| **HK3VR** | P.O. Box 584, Bogota, Colombia. |
| **HK4BQ** | P.O. Box 728, Medellin, Colombia. |
| **HL4KAQ** | P.O. Box 732, Pyongyang, North Korea. |
| **HR3HH** | via K0ZIE |
| **KA2JL** | Box 42, Navy 3835, FPO, San Francisco, Calif., U.S.A. |
| **KA2SC** | P.O. Box 2, Cointrin, Switzerland. |
| **KL7FLB** | Drifting Station Bravo, A.P.O. 942, Seattle, Wash., U.S.A. |
| **LU3ZO, LU5ZO** | via Radio Club Argentina. |
| **SV0WL** | Box 134, Salonika, Greece. |
| **SV0WQ** | Box 107, Rhodes, Greece. |
| **SV0WT** | via I.S.W.L. |
| **SV0WV** | Box 172, Rhodes, Greece. |
| **UA9OI** | Novosibirsk Radio Club, 36, Michurina Street, Novosibirsk, U.S.S.R. |
| **UR2AR** | Box 137, Tallinn, Estonia, U.S.S.R. |
| **VE3BQM** | P. J. Cutler, Canadian Marconi, P.O. Box 6120, Montreal P.Q., Canada. |
| **VP3EFG** | Box 331, Georgetown, British Guiana. |
| **VP4TP** | P.O. Box 40, Port of Spain, Trinidad. |
| **VP7BQ** | P.O. Box 4187, Grand Bahama Is., Patrick A.F.B., Florida, U.S.A. |
| **VP8DW** | P.O. Box 185, Port Stanley, Falkland Is. |
| **VR6AC** | via W6RCD |
| **VS1JX** | P.O. Box 1575, Singapore. |
| **XE2DO** | P.O. Box 297, Obregon City, Mexico. |
| **ZC4SS** | P.O. Box 216, Famagusta, Cyprus. |
| **ZD9AL** | S.E. DX Club, P.O. Box 749, Atlanta 1, Georgia, U.S.A. |
| **ZP5CF** | P.O. Box 512, Asuncion, Paraguay. |
| **ZS3LW** | P.O. Box 2773, Windhoek, S.W. Africa. |
| **5A5TZ** | Major L. Beaumont, R. Signals, Army Apprentice School, Harrogate, Yorks. |
| **G3GUP (ex-5N2GUP)** | E. Howell, 164 Beeches Rd., Chelmsford, Essex. |
| **5N2RJO** | R. J. Osborne, N. Region Development Corporation, Kaduna, N. Region, Nigeria. |
| **6O1DRS** | P.O. Box 6, Mogadiscio, Somalia. |
| **6W8CB/MM** | via K0GZN. |

* * *

**R.S.G.B. QSL Bureau;** G2MI, Bromley, Kent, England.

DX Association, 127 Castlewood Road, Toronto 12, Ontario, Canada.

**ZD3P** provided the first s.s.b. activity from Gambia, the operator being 5N2PJB on his way back to the U.K. QSLs should be sent to W7VEU.

FB8CE is expected to provide activity from the **Comoros Island** in the near future when he will sign **FH8CE.**

### DXCC News

**Kure Island** and **East Pakistan** have been added to the A.R.R.L. Countries List. Confirmations for contacts must be dated November 15 or later, and can be submitted for DXCC credit after July 1, 1961.

An up to date **Countries List** can be obtained from R.S.G.B. Headquarters or G2BVN, price 6d. or one I.R.C.

### Contests

Activity for the current season is more or less over, but organizers of events scheduled to take place next winter are asked to send in particulars for publication. In the meantime results are coming to hand and the first of these deals with **the CQ W.W. DX Contest** (telephony section). In this event the highest all-band single operator score was made by VQ4DT who amassed 558,285 points. He was followed by VQ2WZ (411,344), PZ1AX (324,702), KH6IJ (312,223) and ZD2JKO (281,732). It is pleasing to note that of the first five stations, three are located in the Commonwealth. In the multi-operator multi-transmitter section, the Science Museum station, GB2SM, was placed third with a score of 186,660 points. On 21 Mc/s VQ4RF was the leader with 214,389 points, followed by G3FXB (103,818). On 14 Mc/s fifth position went to G3NNT with 54,944 points. The winner in this section, CX2CO, totalled 333,168 points. In reporting these results W1WY mentions the extremely poor representation from U.K. stations.

The 24 hour c.w. contest sponsored by the U.S.S.R. produced intense activity from all the autonomous republics, mainly on 14 and 21 Mc/s. Stations from UJ, UH, UG and UI were heard at good strengths and were workable without difficulty.

### Awards

The only new award to be reported is the **Diplome de la ville de Brazzaville** (D.V.B.) which can be claimed by amateurs outside Africa who can prove contacts with five stations in Brazzaville. Applications should be sent to the D.V.B. Manager, P.O. Box 898, Brazzaville, Rep. du Congo, and should consist of a list of the contacts showing frequency and date of the QSO. Each claim should be accompanied by five I.R.C.

The **'RDS'**, a Bulgarian award, was claimed by G8PL last October and the certificate duly arrived towards the end of April. An unusual feature was that the QSL cards submitted for the award were returned to G8PL through the Bureaux, all duly stamped!

In connection with the **Directory of Awards,** published by K6BX and mentioned last month, G2BVN has been advised that there has been an increase of 20 per cent in the price of the paper used, and in order to keep the cost of the *Directory* at the previous figure of 27/-, the number of free revisions will be reduced from four to three. A satisfactory three ring binder is available for the reduced price of 7/6 post paid. It has just been announced that all U.S. postage rates for overseas mail will go up by 35 per cent from July 1, and accordingly from that date a yearly subscription to the *Directory* will be increased to 30/- (or with binder 37/6). For those already receiving copies of the *Directory* details of the subscription rates for the revision supplements only can be obtained from G2BVN. The rate for the *DX-QSL-NL* remains unchanged at 11/6d.

Congratulations to **G8KS** and **G6LX** who have recently received the Worked 100 S.S.B. Certificate offered by *CQ* Magazine.

It has been announced by W1WDD that the trophy he offered, and which was mentioned in *M.O.T.A.* in September, 1960, has been won by Rundy, W3ZA, when operating as FL8ZA.

*G3NHL operating GD6UW, the Cambridge University Wireless Society's DXpedition station in the Isle of Man, in April 1961. The transmitter was a Labgear LG300 and the receiver an Eddystone 888A.*

### DX Briefs

After a last fling when operating from East Pakistan **AP2CR** is now on his way back to the U.K. and will sign GW3JET.

**FQ8HO** is now QRT but QSLs can be obtained from K6EC by whom reply postage will be appreciated.

**3V8CA** will be going to the U.S.A. on leave during June, but will be returning to Tunisia for a further tour of about two years.

For those anticipating QSLs from **VP8DG** the next boat from Port Lockroy will leave during December 1961.

XW8AL continues to provide a good signal from **Laos** despite damage to his aerial during the recent disturbances. At present Phan is the only operator using a.m. and can be heard on most days during the afternoons on 21 Mc/s. XW8AQ operates 14 Mc/s c.w. XW8AC has now closed down (G3NOF).

Following his recent Top Band operation from Peebles, all QSLs have been despatched by **GM3DXJ,** who hopes to put Selkirk and East Lothian on the air during the August Bank holiday period.

K9QIZ (3825, N. Avers Avenue, Chicago, Ill.) is particularly anxious to contact operators living in the Wembley Park (London) area. VE4MF is on the lookout for U.K. QSOs on 14 Mc/s c.w.

Now reinforcing FB8XX with **Kerguelen Islands** operation is FB8PN who has been worked on 14 Mc/s c.w.

**KL7FLB** is located on a floating iceberg some fifty miles from Alaska. The fifteen inhabitants are engaged on weather station duties (GM3JDR).

**5A5TZ** has closed down and is returning to the U.K. All outgoing QSLs have been despatched, but some 500 incoming cards are awaited, and may be sent to the address in *QTH Corner*.

**LA4WH/P** is now active from **Jan Mayen,** usually on 14 Mc/s c.w.

### W.A.C.

**G2FYT** details a 14 Mc/s c.w. W.A.C. between 19.20 and 21.18, involving ZS6, PY1, VS2, VK4, W2 and OH3, on February 28, 1949. **G3HRO** took part in a s.s.b. round table in which the other participating stations were ZL3PJ, VK3AEE, PY2JU, W5SVP, CN8GC, DL4SV and KA2FC. This took place on October 28, 1956, at 08.00. **G3GUP** (ex-5N2GUP) reports another s.s.b. round table in 1957 which produced acknowledgements from W3PGB, F7AC,

**DXotic Showcase**

| | |
|---|---|
| **21 Mc/s c.w.:** | CR5AR, 10; FU8AA, 08; KW6DG, 08; PY7LJ, 18; VS9MB, 18; ZD7SE, 17. |
| **21 Mc/s a.m.:** | CR4AX, 19; ET2VB, 13; UA0LO, 10; VK9RO, 11; VP8DW, 19; VS5GS, 16; XW8AL, 16. |
| **14 Mc/s c.w.:** | AC5PN, 14; EA0AB, 18; JZ0PH, 14; KM6AD, 15; KS6CU, 07; UA0KYA, 07; VK9GP, 07; VR1B, 17; VR3L, 07; YK1AD, 17; ZS2MI, 17; 9N3PM/AC4, 18. |
| **14 Mc/s s.s.b.:** | DU7SV, 19; FK8AS, 08; KB6BH, 07; KW6DB, 10; KX6BQ, 14; VR6AC, 07; ZD9AL, 19; ZK1BS, 08; ZD1ES, 20. |

(times in G.M.T.)

HZ1AB, ZS6KD, KH6RU, YV5FL and W7DSC, the time taken to call the roll being 85 seconds.

### Band Reports

On **1·8 Mc/s** conditions are no longer favourable for trans-atlantic contacts, the last stations heard being W2IU, K2DGT and VE1ZZ. The second half of the A.R.R.L. Contest was disappointing and it seems likely that the only interesting signals will be coming from the Continent. The HK0TU expedition from Malpelo Island did show up on 1800 kc/s but as far as is known was worked only from the U.S.A. G3DXV draws attention to regular s.s.b. activity around 1910 to 1930 kc/s.

The **3·5 Mc/s** band has produced some interesting signals but with a change in conditions the band has been closing earlier, usually around 08.00. Signal strengths from U.S. stations have not been good, although the A.R.R.L. Contest produced a spurt of activity. DX mentioned by B.R.S.20317 includes EA8CG (06.20), K6EVR (06.54, and his first in the sixth district), CO2PY (07.00), TI2LA (06.00), OH0NI (06.20), KV4CI (23.40), and UM8KAF (23.45) obtaining no answer to his CQs. UA9CM was heard at S7 at 22.50 and VP7BQ at 06.15. HK0TU was known to be on the band but apparently did not work into Europe. PZ1AX reported that he had been listening for European signals but had heard very little recently and assumed that there would now be little DX until next winter.

The **7 Mc/s** band is also on the decline but some worthwhile DX is still being heard including good signals from VK (07.00), and ZL (07.00 to 08.00). Outstanding signals were from VK2AGH and VK3ADB (07.15) both 589, and also VK7MZ heard between 07.00 and 08.30. A surprise logging was that of FK8AH at 07.50 on 7016 kc/s. HK0TU was heard working North American stations. Other attractions have been F9OQ/FC (06.30 to 09.00) and VP5CD (07.30) on S. Caicos. B.R.S.20317 mentions very poor evening conditions with a high level of jamming making reception very difficult. It appears that although the band is not now producing such good signals as earlier this year it will repay an early morning scrutiny when such stations as KW6DG, KM6BI, JA6ACZ, CE2VV and YN4AB may be heard. The calls mentioned in this and the two preceding paragraphs have been heard or worked on c.w.; neither a.m. nor s.s.b. has apparently produced anything of unusual interest.

Once again **14 Mc/s** has carried most of the DX traffic, a state of affairs which will be with us for some years ahead. Although there have been some bad patches, signals from most parts of the world have been heard and worked during the month. The early mornings have produced DX from the Pacific on a number of days, although conditions have been far from stable. G6XL worked VR3L on 14,075 at 07.00 but no other reports of QSOs with Christmas Island have been received. VR6AC caused quite a stir when appearing on s.s.b. for the first time, but so far only a few European QSOs have been made. The frequencies in use are in the region of 14,250 or 14,120. The Hillary Himalayan expedition (9N3PM/AC4) has been worked on c.w. at 18.45, while ZS stations report s.s.b. QSOs. KB6BH operating from Canton Island is another desirable catch but has proved difficult with a transmitter power of only 30 watts. Also during the morning the various U.S.S.R. countries have been worked, including UG6, which G8PL suggests is probably the most difficult to contact. The early evenings have been productive of good signals from Asia and HS1X was heard from 17.30 to 18.30 when using an aerial only 12 ft. above the ground. VS6EK, CR9AH and several KR6s have also been outstanding during this period. AC5PN has been heard between 13.00 and 15.00 usually on 14,080 c.w., although a.m. on 14,280 has been logged. Activity from this station is usually confined to the weekends. From the Philippine Islands DU7SV, DU1SA and DU1VQ have all been heard on s.s.b. as late as 20.00. Pile-ups have developed round the frequencies of ZD1ES (19.00) and VK9RO (10.00), both newcomers to s.s.b. In a northerly direction UA1KED, from Franz Josef Land has been heard frequently around 09.00 on c.w. but signals have not been good and the Northern European QRM has proved difficult to pierce. Although conditions are allegedly on the downgrade GM3JDR lists 97 countries worked on s.s.b. between March 7 and April 19. The aerial in use is a dipole.

**21 Mc/s** has produced some very useful, if not exotic, DX but conditions have been extremely patchy and to obtain results a considerable amount of time must be spent. Generally the early mornings have not been very productive, although intermittently the Pacific stations have appeared. The evening hours have not been blank and signals from several continents have been heard, including CR4AX (19.25), CR6LA (18.30), ZP5CF (21.10), VP5RD (17.40), CE3RC (19.35), HC2DB (18.50), XE2DO (19.35) together with 6W8s and VS1s. These contacts were made using a.m. G3NAC laments the lack of interest in the French 'phone contest saying that there was a good quantity of English speaking DX to be worked. To show that this band is not dead G3NAC quotes 100 countries worked in two months using a DX40. PY7LJ, worked around 18.00 on c.w., may soon be leaving Fernando de Noronha (a separate DXCC country), and it is not yet known if the island will then have amateur representation. 21 Mc/s has always produced signals from the various former French colonies, now independent republics, and the elusive Central African Republic has been heard in the shape of FQ8HN and '8HT at times between 12.00 and 16.00 on a.m.

With the exception of F.R.S. 309, nobody mentions **28 Mc/s** although African and South American signals have been heard. The log submitted by our reporter from Virginia shows the remarkable divergence of conditions between the U.K. and North America, in that some 30 countries have been logged on a.m., ranging from Central and South America to Africa and New Zealand.

* * *

All news items, information on DXpeditions, band conditions and other information will be welcomed, but, in accordance with the opening paragraph of *M.O.T.A.* for March, lists of calls heard and worked are not now requested. Thanks are offered to the correspondents who have written to G2BVN, and acknowledgements are made to the *DX'press*, the *West Gulf DX Club Bulletin* and *DX* (W4KVX).

Please send all correspondence to arrive at R.S.G.B. Headquarters not later than May 19.

# Single Sideband

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

THE usual commercial practice is to rate a transmitter on p.e.p. r.f. *output*, and for an a.m. and an s.s.b. transmitter of equal p.e.p. output the often quoted figure of 6db in system gain for the s.s.b. transmitter with single tone input, is a correct one. Alternatively, if equal p.e.p. output is not quoted, the comparison is made on the assumption of equal p.a. efficiency. This should not be considered as unfair because there are methods used commercially of obtaining much greater peak efficiency from a linear amplifier than the usually accepted figure of 66 per cent. Commercial practice and the figure quoted by the professional engineer does not, however, necessarily apply to the two modes of transmission, a.m. and s.s.b., when the transmitters are set up and adjusted to the allowable peak operating conditions as defined by the Amateur (Sound) Licence. In fact, the relative " talk power " of the s.s.b. transmitter is directly dependent on the method used to obtain the initial measurement of the r.f. envelope voltage under continuous carrier, 150 watt d.c. input conditions.

The G.P.O. regulations in regard to power measurement of the A3a transmitter are as follows:

" The peak r.f. power output from an A3a transmitter shall not exceed that obtained from the A3 transmitter working at an overall efficiency of 66 per cent. The power shall be measured by the following process.

(*i*) Apply a pure sinusoidal tone to the transmitter and adjust the input to 150 watts d.c.; the deflection on a cathode ray tube by the r.f. envelope shall be measured. (D.c. input power is the total d.c. power input to the anode circuit of the valve(s) energizing the aerial.)

(*ii*) Replace the tone by speech; the maximum deflection on the cathode ray tube showing the r.f. output caused by the peak of speech shall not be greater than twice the previously measured deflection for the tone input."

## Power Amplifier Efficiency

Before dealing with the actual measurement procedure it would be wise to consider the difference between linear (s.s.b.) and class C (a.m.) amplifier conditions and their effect on the r.f. output voltage and power.

In an A3 transmitter the p.a. is operated in class C with a constant grid drive and the modulation is superimposed on the carrier by varying the p.a. h.t. supply voltage (from zero to twice the d.c. supply value) at the frequency of the required modulation. The efficiency of the class C amplifier is of the order of 75 per cent and because the r.f. grid driving voltage is constant the efficiency remains substantially the same at any modulation percentage from zero up to 100 per cent. In the case of the A3a linear amplifier, the efficiency at full output using modern valves designed for this service is approximately 66 per cent. (This is the maximum obtainable efficiency for class B operation—under other modes such as AB1 or AB2 the figure is more likely to be between 50 and 60 per cent.) *With less than the full output the efficiency is proportional to the exciting voltage.* This means, then, that under full grid drive conditions the efficiency is 66 per cent but under half grid drive conditions the efficiency is 33 per cent.

This has an important bearing on the r.f. envelope voltage obtainable under single tone input as defined in para. (*i*) of the regulations, because under these conditions the amplifier grid drive voltage must be half the peak value that would be required for peak modulation as defined in para. (*ii*). In simple terms this means that the under c.w. conditions the initial cathode ray tube measurement is being made with a linear amplifier operating at an efficiency of 33 per cent, and the cathode ray tube deflection would be 0·707 of that obtained if the measurement had been undertaken using a class C amplifier.

To summarize the conditions of para. (*i*) and para. (*ii*) of the G.P.O. regulations:

*A3 transmitter, class C amplifier.*
150 watt d.c. input, 66 per cent efficiency.
C.R. tube deflection = 1·0.

*A3a transmitter, single tone input to class B amplifier.*
150 watt d.c. input, 33 per cent efficiency.
C.R. tube deflection = 0·707.

*A3a voice input.*
C.R. tube deflection = 1·414.

*A3 transmitter 100 per cent modulation.*
C.R. tube deflection = 2·0.

It is seen that the difference in the two envelope voltages represents a loss to the A3a transmission of 3db—this is half the allowable peak envelope power of the A3 transmission.

## Measurement Procedure

It is clear from the opening sentence of the licence regulations that the two methods of transmission, A3 and A3a, are put on the same basis in regard to allowable peak r.f. voltage, and therefore the allowable peak r.f. power output. In consideration of this it is then permissible for the A3a operator to increase the bias to his linear amplifier in order to obtain the increased efficiency of class C operation before making cathode ray tube r.f. voltage measurements. The overall transmitter efficiency, allowing for the tank circuit losses, would then be the quoted figure of not more than 66 per cent.

It should be remembered that when a single tone modulation is applied to an A3a transmitter the amplifier output is pure c.w. At this stage of the measurement procedure both transmitters are radiating an unmodulated c.w. signal and for the purpose of measurement of r.f. envelope voltage are on exactly the same footing. Under 100 per cent modulation conditions the a.m. envelope expands to twice the unmodulated value. Under A3a voice modulation the peak envelope voltage is allowed to expand—also to twice the " unmodulated " value. The two transmitters are therefore on the same basis in regard to allowable peak r.f. power.

In practice, having defined the peak limits, two lines would be marked across the cathode ray tube face with wax crayon, or any other convenient method, and provided these limits were not exceeded the A3a transmitter would be running within the allowable G.P.O. ratings.

Before actual operation as a single sideband transmitter the p.a. bias would be adjusted for linear amplifier operation —this could be anything between pure class A operation, AB1, AB2 and class B—depending entirely on the individual requirements of the station operator. The lower deficiency of class AB1 operation will require a larger power supply; however, those s.s.b. operators who are concerned to radiate a " clean " signal with a low order of third order distortion products and the minimum amount of splatter and harmonic output, generally use class AB1 operation with the highest possible anode dissipation within the valve ratings. They are therefore prepared to use more electricity from the supply mains to generate the allowable peak r.f. output, in the interests of better power amplifier linearity and a cleaner signal and less interference on the amateur bands. In fact, the sideband operator who prefers to sacrifice p.a. efficiency and operate in class AB1 is not penalized by doing so, and possibly the present method of A3a rating was devised with this in view in order to encourage the use of amplifier arrangements affording the most linear method of operation and the least possibility of broadcast and television interference.

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

### Amateur " Talk Power "

As the allowable peak operating condition in the U.K. for A3 and A3a is the same, the peak envelope power output is equal for both modes of transmission. Under these conditions the audio voltage developed at the receiver diode detector is twice as great for A3a as it is for A3—the " talk power " of the single sideband transmitter is then 6db better than the a.m. transmitter. However, this is only true under the conditions usually stated—that is, equal peak r.f. output, single tone sine wave input and a linear amplifier operating under full output under maximum efficiency conditions.

With a single tone input the average output power and the p.e.p. are equal, therefore a comparison based on a single tone input is favourable to the s.s.b. case and for that reason is generally used. Under two tone (voice) input conditions the average linear amplifier driving voltage is about half of the peak value and at this input level the amplifier efficiency is also halved and the output power reduced accordingly. With the a.m. transmitter and class C operation the p.a. efficiency stays more nearly constant at all levels of modulation. Therefore the linear amplifier is at a disadvantage; if the *average* power under voice modulation conditions is taken as a more realistic basis of comparison between the two methods, the figure of the s.s.b. mode would become a transmitter gain of 3db and in the opinion of the writer, under practical operating conditions with the two transmitters adjusted for equal peak r.f. envelope voltage, this is the figure that should be used.

It would seem fair then to bring the subject of " talk power " to a conclusion by finally stating the following: under U.K. licence regulations the gain in " effective talk power " of the s.s.b. method of transmission in comparison with the a.m. transmitter under voice modulation conditions is 3db.

The claim of a further 3db in signal-to-noise ratio at the receiver is a controversial one. Under ideal propagation conditions and a strong received signal, the reduction of receiver bandwidth is of no advantage. Under poor propagation conditions and a weak received signal the reduction of bandwith and the use of a locally generated carrier may give an improvement in readibility of 9db. To sum up—the gain at the reception end is a variable figure—it may be anything from 0 to 9db. It cannot be evaluated precisely because the figure obtained in practice depends on band conditions, the quality or otherwise of the receiver in use, and in addition the skill and the experience of the receiver operator.

Finally, to the amateur the greatest advantages of the s.s.b. technique of communication cannot be evaluated as so many db. There are more important considerations than power gain. A system that can offer the elimination of carrier heterodynes, twice the number of voice channels in the same bandwidth, more speech and a lot less interference, the elimination of the monologue " over to you " type of a.m. transmission and in its place normal " back and forth " conversation and last but by no means least, the uncanny ability to " get through " under the most difficult band conditions, surely has everything to commend itself to the progressive radio amateur.

### Osmo Wiio (OH2TK) now President of S.R.A.L.

THE news that Mr. Osmo Wiio (OH2TK) has been elected President of the Finnish National Amateur Radio Society, S.R.A.L., will be received with much pleasure by his many friends in the United Kingdom.

Mr. Wiio represented his society at the Stresa, Bad Godesberg and Folkestone I.A.R.U. Region I Conferences, and he was a member of the Finnish delegation to the Geneva Radio Conference. He has been the V.H.F. Manager of his society for many years and in recent times has edited the monthly journal of S.R.A.L.

## HUNSTANTON MOBILE RALLY

**SUNDAY, MAY 28, 1961**

A large car park on the sea front immediately opposite the railway station will be reserved for visitors. The admission fee of 3/- per vehicle will include all occupants and also entry in the competition A feature of the rally will be a Junk Sale for which no commission will be charged.

**RALLY STATIONS**

**1·8 Mc/s—G3ANM/P 3·5 Mc/s—G3KPO/P**
**144 Mc/s—G3ARS/P**

*Organized by Peterborough and District Amateur Radio Society.*

## SOUTHERN COUNTIES MOBILE RALLY

**Beaulieu Abbey, Beaulieu, New Forest, Hampshire**

*(on the B.3506 Lyndhurst-Beaulieu road)*

**SUNDAY, MAY 28, 1961**

Attractions include Lord Montagu's Vintage Car Museum, and Beaulieu House (reduced admission). Boat excursions on the Solent and a Mobile Treasure Hunt. Reserved rally car park. Ample catering.

**RALLY STATIONS**

**1880 kc/s—G3IVP/A 144·14 Mc/s—G3ION/A**

will be on the air from 10.30 a.m.

*The rally programme may be obtained by sending a s.a.e. to L. H. Daish (G2FGD), 7 Bracken Lane, Shirley, Southampton.*

## NORTHERN MOBILE RALLY

**Harewood House, Yorkshire**

*(7 miles from Harrogate, 8 miles from Leeds on the main A61)*

**SUNDAY, MAY 28, 1961**

Attractions include the State Rooms and Private Apartments containing a world famous collection of paintings, furniture, porcelain and other art treasures. The event will commence at 12.30 p.m. and admission to the grounds and rally will be 1/6 (Children 9d.) Free Rally Car Park. Usual competitions and free Lucky Dip for junior ops.

**RALLY STATION**

**G3MMK/A on 1981 kc/s**

will be on the air from 11.30 a.m.

*Organized by Spen Valley Amateur Radio Society*

## HARLOW MOBILE RALLY

**Village Hall Field, Magdalene Laver, Essex**

**SUNDAY, JUNE 11, 1961**

**RALLY STATIONS**

**1·8 Mc/s—G3ERN/P 144 Mc/s—G3JMA/P**

will be on the air from 10 a.m.

*Organized by Harlow and District Radio Society*

## LONGLEAT MOBILE RALLY

**Longleat House, near Warminster, Wiltshire**

*(between Frome and Warminster on the A362 road).*

**SUNDAY, JUNE 25, 1961**

Unlimited accommodation for cars in reserved Rally Car Park situated in one of the most delightful settings on the Longleat Estate. Ample catering facilities in the restaurant in Longleat House—no prior booking necessary.

**RALLY STATIONS**

**1900 kc/s—G3CHW/A 144·15 Mc/s—G3GYQ/A**

will be in operation from 10 a.m.

*Organized by City and County of Bristol R.S.G.B. Group.*

### American Odyssey

FRANK FLETCHER (G2FUX, VE2FUX) has produced, with the aid of Maurice and Sylvia Margolis (G3NMR), a 12,500 word description of his travels in Canada and U.S.A. as VE2FUX/M. Copies are available from Mr. Fletcher at 11a Ickenham Road, Ruislip, Middlesex.

# R.A.O.T.A. Reunion

THE Third Reunion of the Radio Amateur Old Timers' Association was held at The Horse Shoe Hotel, Tottenham Court Road, London, W.C.1, on Friday, April 7, 1961. The Chair was taken by Reg. Hammans, G2IG (President 1956, Vintage 1929), who had the support of four other Past Presidents of the R.S.G.B. in the persons of Vic. Desmond, G5VM (1948-49), Leslie Cooper, G5LC (1953), Arthur Milne, G2MI (1954) and Herb. Bartlett, G5QA (1955).

Five Vice-Presidents of the R.S.G.B. (T. A. St. Johnston, G6UT, H. A. M. Clark, G6OT, J. W. Mathews, G6LL, W. H. Allen, G2UJ and D. N. Corfield, G5CD) were among the attendance of 61 and the guest of honour was Major-General Eric Cole, G2EC, ex-SU1EC, ZC6EC (President 1961).

After the loyal toast had been honoured a telegram was read from H.R.H. Prince Philip thanking those present for the loyal greetings which had been conveyed to him earlier on their behalf by the Founder of the Association (John Clarricoats, G6CL).

Nostalgic memories of the early days were recalled by Cecil Page, G6PA (one-time Manager of the Society's Research and Experimental Section) and T. A. St. Johnston, G6UT (a past Chairman of the Contests Committee).

Before Silent Keys were remembered at 9 o'clock G6OT paid tribute to the memory of Gerald Marcuse, G2NM (President 1929-30) whose death the previous day had brought a note of sadness to the Reunion.

An account of the activities of the Association was given by G6CL who reported that 15 members had joined since the previous Reunion and that three founder members, in addition to Gerald Marcuse, had passed on during the year. His proposal that G2EC should be elected an Honorary Member of the Association was adopted with acclamation. It was further reported that the Association now had 101 members (98 full and 3 honorary) and that the Benevolent Fund had reached the satisfactory total of £233 19s.

G2MI in proposing a toast to the Association's Guest of Honour referred to the fact that Eric Cole is the only Englishman to have won the Senior B.E.R.U. Contest twice (first as SU1EC and later as ZC6EC). He also referred to the very long association the Society's President has had with Amateur Radio and reminded those present that Major-General Cole is the first serving officer to fill the Presidential Chair since Brigadier General Sir Capel Holden was President in 1926. G2EC in his reply spoke nostalgically of his Amateur Radio activities in the Middle East prior to and after the war.

*Old Timers Nell Corry, G2YL, and Ken Alford, G2DX, reminisce at the R.A.O.T.A. Reunion in the company of attentive listeners Eric Cole, G2EC and John Clarricoats, G6CL.*

Kenneth Alford, G2DX (a pioneer DX worker and a Council member in the days of the Wireless Society of London) proposed, in unforgettable terms, a toast to the Spirit of Amateur Radio.

G2IG in a brief speech at the end of the proceedings expressed thanks to G6CL and May Gadsden for arranging the Reunion and for the work they had done during the past year to strengthen still further the work of the Association.

Radio amateurs who have held a transmitting licence

(*Continued on page 531*)

*The Third Reunion of the Radio Amateur Old Timers' Association was held at The Horse Shoe Hotel, Tottenham Court Road, London on Friday, April 7, 1961. Forty-seven of the 61 old timers present on that occasion are seen in this picture. Top table, left to right: May Gadsden (Honorary Member), Basil Davis, G2BZ, Vic. Desmond, G5VM, John Clarricoats, G6CL, Eric Cole, G2EC, Reg. Hammans, G2IG (Chairman) Arthur Milne, G2MI, Leslie Cooper, G5LC, Nell Corry, G2YL, T. A. St. Johnston, G6UT and Kenneth Alford, G2DX.*

# Society News

### Message from the President

*FOR about 30 out of the last 40 years as a radio enthusiast I have held an amateur transmitting licence or have been keenly interested in Amateur Radio and for the greater number of these years I have been a member of the R.S.G.B. Throughout that time I had had but slight knowledge of what the R.S.G.B. did except that it published the* BULLETIN *regularly—the receipt of which was always welcome, but possibly no more so than the receipt of other excellent publications covering Amateur Radio interests.*

*For the last 15 years my professional responsibilities have brought me into close touch with national and international radio matters and have given me some understanding of the regard paid to Amateur Radio by Nations and by National telecommunication administrations of the world as a whole, and its true importance relative to other national demands for radio facilities and frequencies.*

*Since January of this year when I was honoured in being asked to serve as your President—I have, for the first time, become aware of the true value of the contributions of the Society to your interests. I have learnt something of the effort put into Society affairs by the Headquarters staff, by the members of the Council, by members of Committees and by Society representatives throughout the U.K., an effort which is provided gladly and without regard to personal inconvenience or time, and with the exception of the hard-worked members of the Headquarters staff, offered and provided completely without financial remuneration.*

*Because of this late realization of the value of these contributions to the interests and affairs of the membership as a whole I feel compelled to write this short note so that members everywhere will be aware of the facts as I now see them to be. If I may draw an inapt parallel —as with the iceberg, the true magnitude and strength of the Society lies not in that which is visible but in that which is beneath the surface.*

*In the case of the Society it is thanks to the little publicized and modestly concealed work of those who contribute to this invisible strength that, in my earnest belief, United Kingdom radio amateurs are at present enjoying many valuable privileges and facilities they would not otherwise possess.* *E. S. C.*

### The Horace Freeman Trophy

MR. HORACE FREEMAN, who recently retired after many years as the R.S.G.B. Advertising Manager, has presented to the Society the beautiful cup, shown in the accompanying photograph. The rules governing the award of the Trophy are as follows:

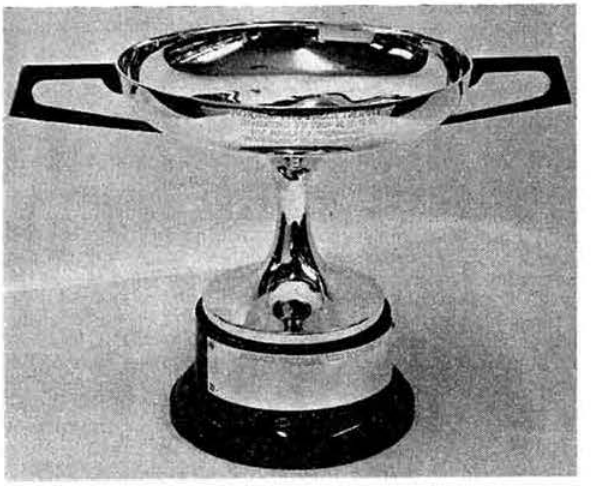
(i) The Trophy will be awarded annually, at the discretion of the Council, to the member who, in the opinion of a panel of three judges appointed by the Society's Technical Committee, has produced for display on the Society's stand at the R.S.G.B. Radio Hobbies Exhibition the most original piece of home constructed equipment.

(ii) In the event of the R.S.G.B. Radio Hobbies Exhibition not being held in a particular year the Council shall award the Trophy to the member who, in the opinion of a panel of three judges appointed by the Society's Technical Committee, has produced for display on the Society's stand at the National Radio Show the most original piece of home constructed equipment.

(iii) The Trophy will be presented at the Annual General Meeting of the Society.

(iv) The Council reserve the right to award the Trophy for some purpose other than that laid down in (i) and (ii).

Mr. Freeman is a Honorary Vice-President of the R.S.G.B.



*The Horace Freeman Trophy.*

### The Office of County (District) Representative

IT has been apparent for some years that the Society's Scheme of Representation is not working satisfactorily in so far as it applies to the office of County or District Representative. The office of C.R. was introduced just after the last war at a time when it was felt that an additional stage of representation midway between that provided by the Regional and Town Representatives should be introduced. The arrangement worked satisfactorily for a while, but it soon became clear that only a very small number of members were interested in taking office as C.R. or in nominating a colleague for that office.

At the end of March 1961 only 17 County or District Representatives had been elected or appointed (out of a possible 60/70) for the current two-year period ending December 31, 1962. Most of those 17 had been appointed as the result of a recommendation by their Regional Representative and not as the outcome of a formal nomination supported by a group of local members. A year earlier when 27 C.R.s were in office, it was felt that the Scheme was not working properly insofar as it applied to C.R.s, but it was decided to make no change at that time. The present scheme provides for regular meetings between C.R.s and T.R.s but there is little evidence to show that advantage has been taken of that provision.

The Society's Membership and Representation Committee recently gave long and careful consideration to the foregoing points and decided to recommend to the Council that the office of C.R. (D.R.) be dispensed with as from January 1, 1963. By a majority vote, the Council has accepted the recommendation and the Committee is shortly to draft a new Scheme of Representation which will provide for annual meetings between R.R.s, T.R.s and A.S.R.s with the appropriate Zonal Representative present as the representative of the Council.

In accepting the recommendation the Council appreciated fully that certain enthusiastic members have consistently

performed yeoman service as County or District Representatives. It is hoped that the new Scheme of Representation will provide for the services of such members to be retained in an organizing capacity.

### Region 11 Representation

CONSEQUENT upon the death of Fergus Southworth (GW2CCU) a casual vacancy now exists in the office of Region 11 Representative.

Nominations signed by 10 Corporate Members resident in Region 11 (North Wales) should reach the General Secretary not later than June 15, 1961, together with a letter from the nominee, agreeing to serve if elected. All present R.R.s are due to retire at the end of the current year.

### Derby Wireless Club Founders at Golden Jubilee Dinner

AS part of the Golden Jubilee Year celebrations organized by the Derby and District Amateur Radio Society, 120 members, friends and guests, attended the founder members' dinner at The Derbyshire Yeoman, on April 22, 1961, to commemorate the foundation of the Derby Wireless Club in 1911. The Derby Wireless Club was the first of its kind to be formed in England. Founder members present included Mr. Alan Trevelyan Lee (LYX), Mr. C. L. Drury (XDB) and Mr. G. E. Mart (URX), together with other past officers of the Club.

Major-General Eric S. Cole, C.B., C.B.E., G2EC (President of the Radio Society of Great Britain) in proposing a toast to the Derby Wireless Club and the Derby and District Amateur Radio Society spoke of the differences in Amateur Radio as a hobby today and those of 50 years ago. Responding to the Toast, Mr. Lee reminisced on his early days,

*Major-General E. S. Cole (G2EC), President of R.S.G.B., with Messrs. A. Trevelyan Lee (ex-LYX and 2DJ) and C. L. Drury (ex-XDB) at the Derby and District Amateur Radio Society's Golden Jubilee Dinner.* (Photo by M. Shardlow, A.1706.)

commenting that the first valve to be seen in the Derby area was obtained by the Club for Repton College. Mr. Lee concluded his speech by presenting the Society's President (Mr. A. G. G. Melville, F.R.C.S.) with a monetary gift, on behalf of the Club, for the purchase of a suitably engraved cabinet to house some of its historic exhibits.

Replying to the President's toast to the guests and visitors, Mr. W. E. Pitts (Chief Constable for Derbyshire) spoke of his interest, as an ex-naval telegraphist, in the Amateur Radio movement and the assistance given by amateurs to authorities in an emergency.

Presentations included specially inscribed badges to Derby Wireless Club members and guests, the President's Trophy to Messrs. A. Hitchcock, D. Sadler and L. Hazlehurst, winners of the 1960 D/F Contest and the G5YY Trophy to Mr. T. Darn, the Society's Chairman, winner of the 1961 Transmitting Contest.

### Unity and Personal Conduct

IN his Presidential Address to the Irish Radio Transmitters' Society, Mr. H. L. Wilson (EI2W) had this to say about unity within his own and other National Amateur Radio organizations.

"If we are to retain our operating privileges, it is most important that all licensed amateurs in this country should become members of our National Society. There is no excuse for any licensed amateur in this country to remain outside an organization that was constituted and is still working for his survival. Such an attitude is not only selfish, but in the long run contrary to the interests of the lone ranger himself. The survival of Amateur Radio is costing more year by year. International conferences are lasting much longer and are more frequent. All this is a costly business but it is essential that the views of the amateur should be placed before such conferences by experienced delegates of our own choice. Only by membership of our National Society, and further by membership of organizations like A.R.R.L. and R.S.G.B., can we ensure that our privileges will be respected and retained in the future. It is therefore imperative that our world organization should be strong, and for this reason I would earnestly appeal to all licensed amateurs in this country to join at least our own National Society, and so reduce the heavy burden on the present members, who by their unstinted devotion have held the fort for so long."

And on the subject of personal conduct Mr. Wilson said:

"I would ask the members to be extremely careful of their operating when on the air. If you have read the Amateur's Code, you will have seen the very first requirement is that THE AMATEUR IS GENTLEMANLY and never uses the air for his own amusement. This does not imply that he must not get pleasure from his operating. It really means that he must avoid any selfish use of the air, and that he must be tolerant of the requirements of other stations. It is also most important that nothing should be said during transmissions that will give offence. Today a very large listening public can receive amateur transmissions, and we must ensure that our conduct is beyond reproach. Let us jealously guard our reputation. Before leaving this subject, I would appeal to our members to be loyal to one another. Sometimes a station may unknowingly commit a technical breach of the regulations. Isn't it a brotherly act to acquaint such station of the position by a telephone message, or by despatch of a letter? Failing this, the help of our committee should be solicited. The wrong thing to do is to take unilaterial action, or broadcast the matter over the air. Such action undermines the work of our own society, and is detrimental to the amateur movement as a whole."

Mr. Wilson's address was delivered to a very large audience at the Standard Hotel, Dublin, on March 24, 1961.

### Claims for "Four Metres and Down" Certificates

APPLICATIONS for awards in any class of the *Four Metres and Down* Certificate should be sent to the V.H.F. Committee, c/o R.S.G.B. Headquarters. Each application should include all QSL cards, a list of call-signs and counties (and countries), and a statement of the class of certificate for which a claim is being made.

All applications will be acknowledged and those submitting valid claims will in due course receive certificates direct from Headquarters. All cards submitted will be returned after scrutiny.

# Council Proceedings

*Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, March 20, 1961, at 6 p.m.*

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

*Apologies for absence* were submitted on behalf of Dr. R. L. Smith-Rose and Mr. A. C. Williams, who was indisposed.

* * *

*R.S.G.B. News Bulletin Service*

It was reported that one of the persons responsible for the jamming of the R.S.G.B. News Bulletin Service had been interviewed by the Post Office and a prosecution was anticipated.

*Membership*

*Resolved* (i) to elect 95 Corporate members and 42 Associates; (ii) to grant Corporate membership to 12 Associates who had applied for transfer.

*Application for Affiliation*

*Resolved* to grant affiliation to the Lincoln Short Wave Club.

*Subscription Rates—Associates*

*Resolved* to request the Finance and Staff Committee to give consideration to the question of subscription rates payable by Associates.

The suggestion was made that the Council should consider introducing two rates of subscription for Associates, e.g. one rate applicable to Associates up to say 16 years of age and another for Associates from say 16 to 21 years of age.

It was agreed to request the Finance and Staff Committee to give consideration to the suggestion.

*R.S.G.B. QSL Bureau*

The Council received from the QSL Manager (Mr. Arthur Milne) a detailed statement on the working of the Society's QSL Bureau.

*Resolved* (i) to receive the statement; (ii) to authorize the QSL Manager to destroy cards addressed to those who do not wish to collect them. (iii) to request the QSL Manager to prepare for publication a suitable paragraph in the Society's Journal drawing attention to the difficulties which can arise when members operate under Mobile conditions in a United Kingdom prefix zone other than their own, without providing the appropriate QSL Sub-Manager with envelopes for the despatch of cards; (iv) to request the QSL Manager to prepare for publication in the Society's Journal an article dealing with other QSL problems; (v) to request the QSL Manager to submit to the Council annually in December a brief report on the working of the QSL Bureau during the current year; (vi) to authorize the QSL Manager to accept under-stamped packets of cards from abroad and to review the situation later in the light of experience; (vii) to confirm the action of the QSL Manager in not accepting packets of cards from persons resident in the United Kingdom which are under-stamped.

*Amateur Licences*

The Council took note of the new frequency schedules which will come into use on May 1, 1961. (The schedules were published in the April issue of the BULLETIN.—EDITOR.)

*Mullard Award 1960*

It was reported that the Mullard Award Committee had decided to make the 1960 award to Miss E. Bottomley (G3OHB) and Mr. G. Thomas (G3OGT). (A full statement about the Award appeared in the April issue of the BULLETIN.—EDITOR.)

*R.S.G.B. Amateur Radio Handbook*

The Council received a progress report from Mr. Rouse in which he drew attention to difficulties which had arisen due to the illness of the Society's draughtsman. Alternative arrangements were being made to deal with the situation but a steep increase in production costs now seemed to be inevitable.

*Earls Court Radio Show 1961*

It was agreed to accept an offer made by Radio Industry Exhibitions Ltd., for the Society to exhibit at the Earls Court Radio Show.

*Scottish V.H.F. Convention*

Messrs. Stone and Lambeth reported upon the successful V.H.F. Convention held recently in Scotland.

*O.R.M.'s*

*Resolved* to authorize Mr. Macadie to organize a two-day O.R.M. and Mobile Rally in Ayrshire on dates to be agreed later.

*Lists of New Members*

Consideration was given to a suggestion made by the Region 4 Representative (Mr. Ward) that the Society should publish an annual list of members.

The Secretary reported that the cost of producing such a year book would be very considerable whilst much of the information would be out of date before it could be published. Attention was drawn to the fact that the current edition of the *R.S.G.B. Call Book* which relates only to licence holders in the U.K. contained about 1,850 additions and amendments to the 1960 edition. The Secretary also reported that all R.R.'s receive from Headquarters monthly lists of new members and changes of address affecting their Region including movements into and out of their Region. Details of overdue members are not given to the R.R.'s because difficulties had arisen when this was done in the past.

The Secretary was instructed to bring to the attention of Mr. Ward the information he had given to the Council.

*R.S.G.B. Amateur Radio Call Book*

*Resolved* to accept an estimate submitted by Bentley & Co. (Printers) Ltd., for printing 7,000 copies of the 1962 edition of the *Call Book*.

*R.A.E.N. Committee*

*Resolved* to approve a proposal of the R.A.E.N. Committee to hold a meeting of R.A.E.N. officers and their deputies at Chelmsford on May 14, 1961.

*News Bulletin Service*

*Resolved* to authorize the Secretary to request the G.P.O. to approve the appointment of Mr. D. Menteith (GM3IWU) as reserve News Bulletin reader for the Glasgow area in place of Mr. Macadie (GM6WD). (Mr. Macadie is not at present equipped to operate on 3·6 Mc/s.—EDITOR.)

*Reports of Committees*

The Minutes of meetings of the following Committees were submitted as Reports: V.H.F. (February 13), Mobile (February 15), Finance and Staff (February 17), Golden Jubilee Celebrations (February 18), Contests (February 21 and March 9), Technical (February 23), TVI/BCI (March 8).

*Resolved* to receive the reports and to accept certain of the recommendations contained therein.

The recommendations dealt with the new *Four Metres and Down* Certificate, the Society's V.H.F. Beacon Station at Wrotham Hill, the Scottish V.H.F. Convention; the Woburn Abbey Mobile Rally 1961; interference from an r.f. heating installation in the Portsmouth area; the R.S.G.B. 21/28 Mc/s Telephony Contests 1960, the 144 Mc/s C.W. Contest 1961.

The Chairman of the Finance and Staff Committee reported that the Committee's efforts to obtain a Senior Administrative Assistant had not been successful.

*The meeting terminated at 10 p.m.*

## A.R.M.S. Mobile Safety Standards

THE Amateur Radio Mobile Society has pointed out that the proposed Mobile Safety Standards referred to in *Council Proceedings* in the April issue of the R.S.G.B. BULLETIN were put forward in the form of draft *recommendations* for good operating practice and safe installation.

## "A High Gain Low Noise Transistorized Crystal Controlled Converter for 144 Mc/s"

IN the description of the coils on page 462 of the April issue of the R.S.G.B. BULLETIN, L3 should *not* be tapped. On page 463, the capacitor referred to in connection with the current through TR2 should be C23.

## The U's Have It!

ALF. BARRATT (G5UF) is C.R. for Dorset, Jack Etherington (G5UG) is C.R. for Somerset, and Reg. Griffin (G5UH) is R.R. for the South-West of England.

## GB2RS SCHEDULE

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

| Frequency | Time | Location of Station |
|---|---|---|
| 3600 kc/s | 9.30 a.m. | South East England |
| | 10 a.m. | Severn Area |
| | 10.30 a.m. | North Midlands |
| | 11 a.m. | North East England |
| | 11.30 a.m. | South West Scotland |
| | 12.00 | North East Scotland |
| 145·55 Mc/s | 11.15 a.m. | Beaming south-east from Leeds |
| | 11.30 a.m. | Beaming south-west from Leeds |
| | 11.45 a.m. | Beaming north from Leeds |
| 145·3—145·4 Mc/s | 12 noon | Beaming north from South East England |
| | 12.15 p.m. | Beaming west from South East England |

News items for inclusion in the bulletins should reach Headquarters not later than first post on the Thursday preceding transmission. Reports from Affiliated Societies and from non-affiliated societies in process of formation will be welcome.

# Gerald Marcuse (G2NM)

*A tribute to one who was friend of all and enemy of none*

SO long as the art of Amateur Radio is practised, the name of Gerald Marcuse, G2NM—whose death was briefly reported last month—will be remembered.

Gerry's first interest in wireless experiments dated back to 1913 but his impact on the Amateur Radio movement was not felt until just after World War I when he became Honorary Secretary of the Radio Transmitters' Society. After many months of negotiation, in which Gerry played a major part, the R.T.S. finally drew close to the Transmitter and Relay Section of the Radio Society of Great Britain until fusion, early in 1925, between the two major transmitting groups in the country finally brought to an end a state of uncertainty which had existed for some time.

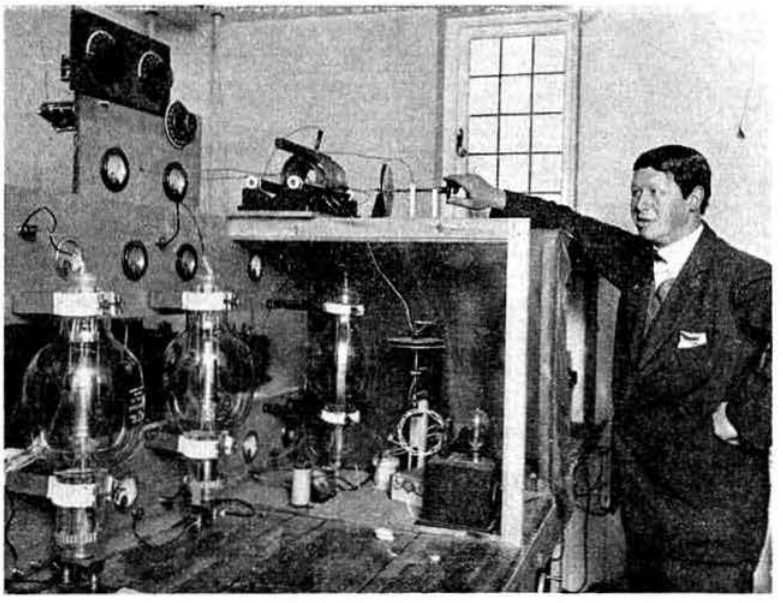
After the fusion Gerald Marcuse became Honorary Secretary of the T. & R. Section (then under the chairmanship of the late Bevan Swift, G2TI) and it was in July of 1925 that the decision was taken to publish a monthly journal—the T. & R. BULLETIN. In that same year Mr. Marcuse, together with a number of other United Kingdom amateurs, journeyed to Paris where a meeting was held to give consideration to a suggestion put forward in April 1924 that an International Amateur Radio organization should be established. During Easter 1925 the International Amateur Radio Union was formed with Hiram Percy Maxim (President of the A.R.R.L.) as President and Gerald Marcuse as Vice-President. Gerry's work during the early years of the I.A.R.U. was outstanding, in fact it was largely because of his desire to foster overseas friendships that he offered, in 1927, to inaugurate an Empire Broadcasting Service, using his own station at Caterham, Surrey.

The difficulties which Mr. Marcuse had to overcome before the first Empire broadcast took place were legion but the results achieved left no one in any doubt that such a service was greatly appreciated throughout the British Empire. When the first Empire broadcast took place on September 1. 1927, Mr. Marcuse had already spent £6,000 on the project. It is of interest to recall that the B.B.C. Empire Broadcasting Service did not commence until 1928.

Mr. Marcuse took part in the Trans-atlantic Tests of 1923 and 1924 and signals from his station were successfully received in the United States on several occasions. In January 1925 G2NM made contact with the Hamilton-Rice expedition, then in the hinterland of South America. The Royal Geographical Society, who had a close interest in the Expedition, were particularly glad to hear of the contacts made by G2NM because no news had been received for many months. In May of the same year, Mr. Marcuse received a letter from the G.P.O. which stated that information had been received from the Japanese Telegraph authorities that signals from G2NM had been heard in Japan. The letter asked Mr. Marcuse to supply precise information regarding the power and wavelength used and concluded by saying that " the information, if furnished, will be regarded as confidential and used for technical purposes only, while if the limitations of your licence have been exceeded in the tests, steps will be taken, if possible, to amend the licence to regularise such tests." Gerry—very naturally—was proud of that letter.

Throughout this period Mr. Marcuse was serving on the Council of the R.S.G.B. In 1927 he became Acting Vice-President, succeeding Capt. (now Lord) Fraser as President in 1929. In 1946 he was elected an Honorary Member in recognition of his outstanding services to Amateur Radio in general and to the Society in particular.

In addition to his interest in Amateur Radio, Mr. Marcuse was an international figure in yachting circles, having won many prizes in home and foreign waters. He held a ship-to-shore licence for the various yachts he had owned.



*Gerald Marcuse with some of the equipment used for the Empire Broadcasts.*

Mr. Marcuse was a member of the West Sussex County Council at the time of his death, having been interested in Local Government work for many years. He was chiefly responsible for the introduction of radio into the County Ambulance Service.

In Bosham—where he had lived for the past 17 years—Mr. Marcuse had distinguished himself as Chief Officer of the Local Fire Brigade. Members of the Brigade acted as pall bearers at his funeral.

During the 1939-45 war Mr. Marcuse, like many other old timers, performed a special duty which earned for him high commendation from those well able to assess its value.

In more recent years G2NM had concentrated on Top Band, 80m and 2m. He was keenly interested in mobile work and was a well loved figure at Mobile Rallies in many parts of the country.

The funeral service on April 10 at the Church of the Holy Trinity, Bosham, was attended by many members of the County Council and by a great many radio amateurs including Kenneth Alford, G2DX, Harry Clark, G6OT, Frank Briggs, G4RD, Victor Sims, G5VS, W. Gearing Sherratt, G5TZ, W. K. Kinchen, G2DZT, A. E. Tillyard, G2IJ, E. St. B Sydenham, G3LOK, Frank King, G2FK and J. Proctor, G2AKC.

In addition to several of those who were at Bosham, Leon Newnham, G6NZ, Ralph Royle, G2WJ, John Clarricoats, G6CL and May Gadsden, were present at Brighton Crematorium later in the day. At both services the Society's wreath was carried behind the coffin by Frank Briggs and the R.A.O.T.A. wreath by Vic Sims.

*Gerald Marcuse operating the short wave receiving equipment used at the time of the Transatlantic tests.*

Kenneth Alford has sent this tribute to the memory of one whose very name breathed excitement to generations of radio amateurs:

" Gerry could only be described as a delightful character, compelling friendship which responded in full measure the world over. I knew him for 42 years and his unbounded enthusiasm for Amateur Radio and the humility with which he acknowledge his lack of technical opportunity gave everyone the greatest pleasure in working with and for him.

He will leave a lasting memorial in his initiation of an Empire Broadcasting Service to which he devoted wholeheartedly his private resources.

He died virtually with a microphone in his hand, carrying on his Radio Circle with that delightful ease and charm we knew so well.

And so he passes leaving behind a memory to all of us—one without an enemy and everyone his friend. I trust that his example, not only as a human being in normal life but also in the world of radio, may leave its mark, as I am convinced it surely will."

VADE ATQUE VALE, GERRY

J. C.

**R.A.O.T.A. Reunion** **(Continued from p. 526)**

issued by the United Kingdom Postmaster General for an unbroken period of 25 years (including the war years) are eligible to join the Association. Enquiries should be addressed to G6CL at 16 Ashridge Gardens, Palmers Green, London, N.13.

**Roll Call**

The following attended the Reunion: " G1YL," G2BZ, DX, EC, GK, HP, HQ, IG, JZ, KI, MI, MR, NJ, NH, NN, PX, QB, TP, UJ, UV, WJ, XV, YL; 3HT; 4RD; 5BV, BZ, CD, CP, DJ, GR, JU, KH, LC, MA, PP, QA, RS, UM, VM, WP, XB, YY; GW5BI; 6CL, FI, FU, HR, IF, IO, LL, MN, OT, OX, PA, PR, QM, RB, SC, SN, UT.

Apologies were received from Dr. Smith-Rose (Honorary Member), G2AK, CX, DC, JF, LZ, ML, QY, UX, VV; 5JO, LJ, RV, UF, UH, VS, YN; 6CJ, GU, OO, XJ, GW2OP. Horace Freeman (Adman) who has been ill was also unable to attend.

### Yet Another Pirate Fined

ON March 24, 1961, at Sevenoaks Magistrates Court, E. T. Worsell of 10 St. James Road, Sevenoaks, pleaded not guilty to a charge of using wireless telegraphy apparatus without a licence contrary to Section 1 (1) of the Wireless Telegraphy Act 1949. He was found guilty and the Court imposed a fine of £25 and ordered him to pay £3 3s. costs.

### G5JO now in Italy

HIS many friends in Amateur Radio circles will be interested to hear that Mr. L. W. Jones (G5JO) of Cambridge, has been appointed Managing Director of a new electronics factory—Pye Electronic S.p.A. Inverigo, Northern Italy. Prior to his new appointment Mr. Jones was Works Director of the Pye Group of Companies.

### International Plastics Exhibition

PLASTIC materials of all descriptions, as well as the complex machinery used for their manufacture, will be displayed at the International Plastics Exhibition to be held at Olympia, London, from June 21 to July 1, 1961.

Tickets may be obtained from Iliffe Exhibitions Ltd., Dorset House, Stamford Street, London, S.E.1.

### Back Issues Offered

MR. O. MAYER, Orchard Way, Edgehill Road, London, W.13, has copies of all issues of the R.S.G.B. BULLETIN back to 1948 which he is willing to give to anybody prepared to collect them.

## Silent Keys

### FERGUS SOUTHWORTH (GW2CCU)

The death of Fergus Southworth (GW2CCU) of Holywell, Flintshire, reported upon briefly last month, has deprived the Society of one of its senior Regional Representatives.

The holder of an Artificial Aerial licence (2CCU) before the war, Mr. Southworth became fully licensed as GW2CCU in 1946. He took office as Regional Representative for North Wales in 1950 and was largely responsible for the extension of Amateur Radio activities in that part of the Principality during recent years. At the time of his death he was President of the Flintshire Radio Society, which he helped to form some years ago.

Born in Bolton, Mr. Southworth moved to Holywell, Flintshire, in 1930 where he set up business as an electrical engineer.

One of his main interests, outside Amateur Radio, was the Royal Observer Corps in which he had served as an officer for 21 years. He was one of the few members of the R.O.C. who served at sea during the war, in fact he took part in the D Day landings in Normandy in June 1944 as an observer on board a ship of the U.S. Navy. He was proud to wear the " Seaborne " badge on his R.O.C. uniform.

GW2CCU was active on various amateur bands with a special preference for Top Band and 80 metres. His cheerful voice will be sadly missed by his many radio friends.

At the funeral, which was attended by several local amateurs, floral tributes were received from the President, Council, Members and Headquarters staff of the R.S.G.B., the Flintshire Radio Society and the Conway Valley Amateur Radio Club.

Sympathies are extended to Mrs. Hilda Southworth, and to her brother, Mr. Eric Foulkes (ex-GW5FU) and the other members of their family.

J. C.

### ERIC WAKEHAM (GW3GYY)

It is with deep sorrow that we record the sudden death of Eric Wakeham (GW3GYY) which occurred on April 12, 1961 following a heart attack on the previous day.

Eric served with the Royal Air Force as a civilian employee for a period and was the owner of the Lanberis Cinema, Caernarvonshire. His cheerful voice on 80m will long be remembered by his many transmitting friends, also by many listeners with whom he kept in regular contact. A member since 1948 he was always helpful and friendly and many amateurs who visited his home will recall the wonderful hospitality that he showed.

The funeral took place on April 15, the cremation at Colwyn Bay being preceded by a service at Llanberis Parish Church, where he was a sidesman. Floral tributes from many Amateur Radio friends were received and, amongst others, GW2HFR, GW3GNT, GW3MDK and G3OMX represented the amateur fraternity, at both services. Listeners were represented by Carl from the Midlands.

To his wife and sons we extend our heartfelt sympathy.—C. R. P.

### A Nice Gesture

A FINE example of co-operation between a local authority and a local radio society recently came to light when the Society's Regional Representative for South Wales (Mr. Cyril Parsons, GW8NP) was invited to thank officially the Bedwellty Urban District Council for a gift of £5 which that Council had made to the Blackwood Radio Club.

The story of the gift starts from an effort to find new accommodation for the Blackwood Club. The officers looked around and eventually discovered an old cottage standing in its own grounds which had been condemned as living accommodation. Fortunately the owner was most co-operative as were the Council Surveyor and Health officers who suggested certain conditions under which the house could be used as a permanent Headquarters by the Club.

The work of renovation was carried out by members of the Club, an effort which came to the notice of a member of the local Council who is also the Youth Employment Officer. The Y.E.O. sent five youths to the Blackwood Club and they all became enthusiastic members. The Club in turn helped the Y.E.O. by putting on a fine display of amateur equipment at an Autumn Fayre in aid of a local mining disaster. The activities of the Club became so highly regarded that a grant of £5 was made to the Club out of a fund for youth activities and cultural purposes by the Bedwellty U.D.C. The grant is to be used to obtain more instructional equipment for R.A.E. pupils.

Incidentally the Club has 42 members and an almost 100 per cent record is obtained at the weekly meetings. Last year five members passed the R.A.E. and three the G.P.O. Morse test. Six members sat the 1961 R.A.E. During recent months eight members of the Club have joined the R.S.G.B.

### Hastings Amateurs to visit German Convention

ON May 17, two members of the Hastings and District Amateur Radio Club, W. E. Thompson, G3MQT (Hon. Secretary) and John Taplin, G3HRI (Committee Member) will be travelling to Western Germany at the invitation of two members of the Marl Amateur Radio Club, Willi J. Münch, DL3XH (President) and Horst Jens, DJ3OD. During their two weeks' stay they will attend the D.A.R.C. Convention in the Westfalenhalle at Dortmund in company with their hosts.

G3MQT normally uses a 160m mobile rig in his car, but for the purposes of this visit he is making it operative on 80m with a d.c. input of about 50 watts. Mobile operation while in Germany will be by DJ3OD under his own call-sign in G3MQT's car. Both English and German will be spoken, and contacts with G stations will be welcomed.

A personal QSO with PA0GKO at Oss, near Nijmegen, when *en route* into Germany is scheduled.

### "The History of Television"

A NEW filmstrip, *The History of Television*, has been added to the range of colour filmstrips introduced by the Mullard Educational Service. It is complementary to an earlier release, *The History of Radio*, and deals with the history of picture transmission from the middle nineteenth century to the present, and explains fundamental principles to show the significance of technical developments.

Its simple approach makes it suitable for use in Secondary Modern Schools, and the lower forms in Grammar Schools; or in senior classes where science is taught as a general knowledge subject, rather than one for examination.

The filmstrip comprises 28 frames and is immediately available from the distributors, Unicorn Head Visual Aids Ltd., 42 Westminster Palace Gardens, Victoria Street, London, S.W.1, price 25/- a copy including comprehensive teaching notes.

# CONTEST NEWS

RESULTS — REPORTS — RULES

## Affiliated Societies' Contest 1961

FOR the third time in six successive years Stourbridge and District Radio Society won the Affiliated Societies' Contest, held on February 4-5, 1961. Their total score of 173 points is the highest since the one point per contact system started, despite the fact that the total number of entries was slightly down on last year. Second place was taken by the Gravesend Amateur Radio Society with a total of 153 points, so the winners had a very clear margin. Third position was closely contested by several clubs, Surrey Radio Contact Club (last year's winners) with 149 taking the place by two points from Oxford and District Amateur Radio Society.

Almost without exception, the logs were good and nearly all clubs used R.S.G.B. Contest Log sheets. Unfortunately it seems certain operators were not up to their usual standard and mistakes occurred with considerable regularity resulting in the deduction of many points.

Conditions during the two periods of the Contest were varied but generally reports were favourable with continentals being heard quite frequently. A number of suggestions regarding the rules, including extra points for club-to-club contacts, will be considered by the Contests Committee when the rules for next year's event are discussed.

A check log from G2BP is gratefully acknowledged.

### Results—Affiliated Societies' Contest 1961

| Posn. | Society | Call-sign | Points |
|---|---|---|---|
| 1. | Stourbridge & District Amateur Radio Society | G8GF | 173 |
| 2. | Gravesend Amateur Radio Society | G3GRS | 153 |
| 3. | Surrey Radio Contact Club (Croydon) | G3BFP | 149 |
| 4. | Oxford & District Amateur Radio Society | G3KLH | 147 |
| 5. | Reigate Amateur Transmitting Society | G3FM | 146 |
| 6. | Dorking & District Radio Society | G3JEQ | 143 |
| | R.A.F. Amateur Radio Society (Locking) | G8FC | 143 |
| 8. | Harlow & District Radio Society | G3ERN | 142 |
| 9. | Ariel Radio Club (Langham) | G3AYC | 140 |
| 10. | Kingston & District Amateur Radio Society | G3KIN/A | 136 |
| 11. | Cheltenham Amateur Radio Society | G5BK/P | 135 |
| 12. | Clifton Amateur Radio Society | G3GHN | 133 |
| 13. | Amateur Radio Club of Nottingham | G3EKW | 131 |
| 14. | Sutton & Cheam Radio Society | G3DCZ | 129 |
| 15. | Crawley Amateur Radio Club | G3JKF | 127 |
| 16. | Medway Amateur Receiving & Transmitting Society | G2FJA/A | 113 |
| | Rotherham & District Radio Society | G3OAM/A | 113 |
| 18. | Grafton Radio Society | G3AFT/A | 111 |
| | Sheffield Amateur Radio Club | G4JW | 111 |
| | South Birmingham Radio Society | G3OHM | 111 |
| 21. | A.E.R.E. (Harwell) Amateur Radio Club | G3HS/A | 109 |
| 22. | Thames Valley Amateur Radio Transmitters' Society | G3IKC | 107 |
| 23. | Wirral Amateur Radio Society | G3NWR | 106 |
| 24. | Blackpool & Fylde Amateur Radio Society | G3NJN | 105 |
| 25. | Edgware & District Radio Society | G3ASR | 103 |
| 26. | Mitcham & District Radio Society | G3OCT/A | 101 |
| 27. | Acton, Brentford & Chiswick Radio Club | G3IIU | 100 |
| 28. | Thanet Radio Society | G3DOE | 99 |
| 29. | A.E.I. Rugby Recreation Club Amateur Radio Section | G3BXF | 98 |
| | Courtauld's Amateur Radio Group | G3CQD | 98 |
| 31. | Ainsdale Radio Club | G2CUZ | 97 |
| 32. | Grimsby Amateur Radio Society | G3NJF | 96 |
| 33. | South Shields & District Amateur Radio Club | G3DDI | 92 |
| 34. | Norwood Technical College Amateur Radio Society | G3HFY/A | 90 |
| 35. | Newbury & District Amateur Radio Society | G3LLK | 89 |
| | Scarborough Amateur Radio Society | G4BP/A | 89 |
| 37. | Portsmouth & District Radio Society | G3DIT | 86 |
| | West Kent Amateur Radio Society | G2UJ/A | 86 |
| 39. | Cambridge University Wireless Society | G6UW/A | 79 |
| 40. | North Kent Radio Society | G3ENT/A | 74 |
| | York Amateur Radio Society | G3HWW/A | 74 |
| 42. | Bradford Amateur Radio Society | G3NNO | 73 |
| | Leicester Radio Society | G3LRS | 73 |
| 44. | Southport Radio Society | G3KJM/A | 72 |
| 45. | Barnet & District Radio Club | G3FFA/A | 71 |
| 46. | Ravensbourne Amateur Radio Club | G3HEV/A | 63 |
| 47. | Torbay Amateur Radio Society | G3NJA | 52 |

## 144 Mc/s Open Contest 1961

WHAT need be said about this contest?

Conditions were excellent, activity was at a very high level all over the country and on the Continent, and the scores obtained speak for themselves. Most unusual of all, everyone was so busy working DX that no time could be spared to criticize the rules or even the method of scoring! A word of warning to a few is, nevertheless, still apparently necessary. The rules for any contest *must* be read and understood before entering. They are all drafted for a purpose, no matter how obscure that purpose may be to those who do not have to check the entries. One or two contestants have had to be forcibly reminded of General Rule 5—and *please* do tabulate logs with the information required, in the order requested: it removes a great deal of the labour involved in checking. In general, however, the standard of log-keeping was very satisfactory, and such penalties as have been extracted arose in the main from ineligible or duplicate contacts rather than errors in contact exchanges.

### Results—144 Mc/s Open Contest 1961

| Posn. | Call-sign | Counties Worked | Points |
|---|---|---|---|
| ‡ | G3LCH/P | 39 | 3055 |
| 1 | G4DC | 33 | 2960 |
| 2 | G2DTO/P | 35 | 2575 |
| 3 | G3NBQ | 38 | 2565 |
| 4 | G2XV | 36 | 2510 |
| ‡* | G3BXF/P | 40 | 2400 |
| 5 | G2HIF | 37 | 2395 |
| 6 | G3BBR/A | 31 | 2275 |
| 7 | G3JWQ | 35 | 2165 |
| 8 | G6GN | 36 | 2140 |
| 9 | G3MCS | 28 | 1910 |
| 10 | G3KMT | 35 | 1865 |
| 11 | G3MTI | 30 | 1750 |
| 12 | G3LLJ/A | 27 | 1715 |
| 13 | G3OBD/P | 29 | 1665 |
| 14 | G3OJY | 30 | 1635 |
| 15 | G3BNL | 32 | 1540 |
| 16 | G3FIH | 29 | 1525 |
| 17 | G3EGK | 28 | 1480 |
| | G3HWR | 24 | 1480 |
| 18 | G3NAE | 26 | 1450 |
| 19 | G3AS/M | 28 | 1425 |
| 20 | G3FD | 23 | 1405 |
| 21 | G3JDN | 25 | 1385 |
| 22 | G3OSC | 25 | 1380 |
| 23 | G3CHW | 27 | 1295 |
| 24 | G2BHN | 24 | 1275 |
| 25 | G5IG | 24 | 1190 |
| 26 | G3OBB | 24 | 1175 |
| 27 | G3JLA | 23 | 1075 |
| 28 | G3LTN | 21 | 1040 |
| 29 | G5ZT | 20 | 1010 |
| 30 | G3HBW | 24 | 1005 |
| 31 | G5UM | 21 | 895 |
| 32 | G3FVG | 15 | 885 |
| 33 | G3MNR | 14 | 880 |
| 34 | G5MA | 23 | 865 |
| * | G3ION | 15 | 865 |
| ‡35 | G3BW | 20 | 860 |
| 36 | G3MHD | 17 | 855 |
| 37 | G3MDH | 18 | 850 |
| 38 | G3OSA | 20 | 840 |
| 39 | G5MR | 4 | 825 |
| * | G3OUT | 9 | 745 |
| 41 | G2MR | 13 | 585 |
| 42 | G3ICO | 12 | 490 |
| 43 | G3JZW/P | 10 | 460 |
| 44 | GM3LDU | 9 | 355 |
| 45 | G2DHV | 7 | 295 |

‡ Not eligible — multi-operator entry.
* County declaration incorrect or missing on cover sheet.

The highest score was achieved by M. Pharaoh (G3LCH/P), who operated from Gibbet Hill, Hindhead, Surrey, using 7 watts to a 4-over-4 slot fed Yagi, and a 12AT7 cascode converter. G3LCH/P very correctly declared his entry as " multi-operator " and is therefore ineligible for an award. Accordingly, the Council has awarded the Mitchell-Milling Trophy to P. W. Winsford (G4DC), who ran 75 watts to a 6-over-6

slot fed Yagi from his home QTH. Runner-up was a well-known contest performer, N. Hales, G2DTO/P, who ran 12 watts to a 4-over-4 slot beam aerial from his usual portable "mountain," Ditchling Beacon, near Brighton. A very creditable third place was taken by a newcomer, P. Burt (G3NBQ) of Coventry with 80 watts to a 4-over-4 slot beam and a G2IQ type converter.

Comments from most entrants are received with thanks but particular acknowledgement is given to check logs from G2UJ, G5TZ, GC2FZC and GW3CBY. Incidentally, had G5TZ submitted his log as an entry, he would have walked away with first place, scoring 3,090 points!

### R.S.G.B. 21/28 Mc/s Telephony Contest 1960

IN the table of results on page 486 of the April issue of the R.S.G.B. BULLETIN, the call-sign of the station placed 22 should have been shown as G3NS*Y*.

### D/F Qualifying Events

DETAILS of forthcoming qualifying events are as follows:

#### SLADE/RUGBY

**Sunday, May 28.**
**Organizers:** The Slade Radio Society. Hon. Secretary: C. N. Smart, 110 Woolmore Road, Erdington, Birmingham, 23, jointly with D. T. Wilson, 17 Berwood Farm Road, Sutton Coldfield.
**Frequency:** 1899·5 k/cs.
**Call-sign:** G3JBN/P.
**Map:** Ordnance Survey, New Popular Edition, Sheet No. 130.
**Assembly Point:** Frankley/Egg Hill Road, elevation 830 ft. (N.G.R. 993798).
**Assembly Time:** 13.00 B.S.T.
**Entries and Tea:** Intending competitors should notify the Organizer (Mr. C. N. Smart) not later than first post on Monday, May 22, stating the number in their party requiring tea, which will be held at 17.30 B.S.T. at a restaurant near the finishing point. The venue will be advised to individual competitors under the cover of a sealed envelope.

#### OXFORD

**Sunday, June 11.**
**Organizer:** Robin J. Pearce-Boby (G3JLE), 18 Quarry High Street, Headington, Oxford.
**Frequency:** 1875 kc/s.
**Call-sign:** G3JLE/P.
**Map:** Ordnance Survey, New Popular Edition, Sheet No. 158.
**Assembly Point:** 200 yards past Field Farm, Nr. Worminghall. (N.G.R. 631096).
**Assembly Time:** 13.00 B.S.T.
**Entries and Tea:** Intending competitors should notify the Organizer at least seven days in advance stating the number in their party requiring tea at the Barley Mow, Clifton Hampden (N.G.R. 548953).

### R.S.G.B. 1250 Mc/s Tests 1961

THE Council and the Contests Committee hope that the sixth series of R.S.G.B. 1250 Mc/s Tests will again attract the support of u.h.f. workers. The rules are as follows:

**Rules**

The event will have few fixed rules, other than the duration, which will be from 17.00 G.M.T. on Saturday, June 10, to 22.00 G.M.T. on Sunday, June 11, 1961, and the provision that all entries must be from fully paid-up Corporate Members of the R.S.G.B. and accompanied by the declaration set out below. Entries can be accepted only on behalf of an individual station, though no limitation is placed on the number of operators or assistants. Entries from receiving stations will be welcome and will be eligible for the award.

The entries will be required to include details of stations heard or worked (with distances) and general observations on the band. A full description of all equipment used should be included and this information and any other evidence submitted of work carried out on the band will be taken into consideration when judging the event. The Contests Committee reserves the right to abstract information for the purpose of preparing a report on the Tests. The entrant submitting the best entry in the opinion of the judges will be recommended to the Council for the award of the ***Arthur Watts Trophy.***

Entries must be addressed to the Contests Committee, Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, and be postmarked not later than June 26, 1961. Entries must contain the following declaration.

*I declare that my station was operated strictly in accordance with the rules and spirit of the Tests and I agree that the decision of the Council of the Radio Society of Great Britain shall be final in all cases of dispute.*

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

### 70 Mc/s Contest 1961

THE rules for this year's 70 Mc/s Contest organized by the R.S.G.B. are as follows:

**When:** From 17.00 to 23.59 G.M.T. on June 17 and from 07.00 to 19.00 G.M.T. on June 18, 1961.

**Locations:** Stations, fixed and portable, must be operated from the same site throughout the contest.

**Eligible Entrants:** All fully paid-up Corporate Members of the R.S.G.B. resident in Europe. Multiple-operator entries will be accepted provided only one call-sign is used (see R.S.G.B. Contests Rule 7).

**Contacts:** The entrant may transmit only on his licensed frequencies between 70 and 73 Mc/s, but contacts may be made on A1, A3 or A3a with stations operating in any band between 50 and 150 Mc/s.

**Scoring:** Will be on the basis of one point per mile.

**Contest Exchanges:** RST (RS) reports followed by the contact number (starting with 001) followed by the location (e.g. RST 579001 5NE, Oxford).

The location transmitted for each contact must be given on the Cover Sheet. (This location is to be identifiable on the Ordnance Survey 10 mile to the inch map.)

**Entries:** (*a*) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed. The N.G.R. of the site must be stated.

(*b*) Logs must be tabulated in columns headed (in this order) " Date/Time (G.M.T.)," " Call-sign of Station Worked," " My report on his signals and serial number sent," " His report on my signals and serial number received," " Location of station as received," " His Band (Mc/s)," " Points Claimed."

(c) Entries must be postmarked not later than **Monday, July 3, 1961.**

**Awards:** At the discretion of the Council, a **certificate of merit** will be awarded to the winner. A **certificate of merit** will also be awarded to the member submitting the best check log in the opinion of the Contests Committee.

The General Rules for the R.S.G.B. Contests published on page 341 of the January 1961 issue of the *Bulletin* apply to this contest.

### Chilterns Mystery Mobile Rally

ON the afternoon of June 11, the Amateur Radio Mobile Society, in collaboration with the Chiltern Amateur Radio Society, will hold a mobile rally in the form of a 60-70 mile tour of the Chilterns, commencing at 2 p.m.

Rally stations will be in operation on 2 and 160m, but mobile contacts on other bands will also count for points. A good road map of the area, preferably the one inch to the mile Ordnance Survey, will be necessary.

Tea is being arranged and those intending to be present are asked to advise Norman Fitch (G3FPK), 79 Murchison Road, London, E.10, or C. Simpson (G3OOZ), 2 Mead Street, High Wycombe, Bucks., of the number in their party. Further details may be obtained by sending an addressed foolscap envelope with a 2d. stamp.

The S.X. Mystery Mobile Rally held on March 26 was won by G3ALK with G3IRL as navigator. There was an attendance of 18 amateurs.

### Cannock Meeting

AN informal social gathering of licensed amateurs and shortwave listeners will be held at Cannock, Staffordshire, on July 16, 1961. The assembly point will be outside The Tavern Inn, Shoal, Cannock, at 3.30 p.m., with tea, price 5s., at the Tavern at 5 p.m. After tea, there will be a mobile tour of Cannock Chase, returning to the Tavern Bar at 7 p.m. In the event of rain, the Tavern lounge will be available from 3.30 p.m. A talk-in station will be in operation on 1920 kc/s from 12.00-15.30 B.S.T. Those intending to be present are asked to inform John Morris (G3ABG), 24 Walhouse Street, Cannock, not later than July 10.

**COPY DEADLINE**

**TO enable the R.S.G.B. BULLETIN to be printed in time for bulk postings to take place by not later than the 14th day of the month, the closing date for editorial copy, the 22nd day of the preceding month, must be strictly adhered to. Society Representatives and Club Secretaries will greatly assist the Editorial staff by posting copy to reach Headquarters by not later than the 20th of the month whenever possible.**

**Copy received after the 22nd day of the month will be held over for future use if still topical.**

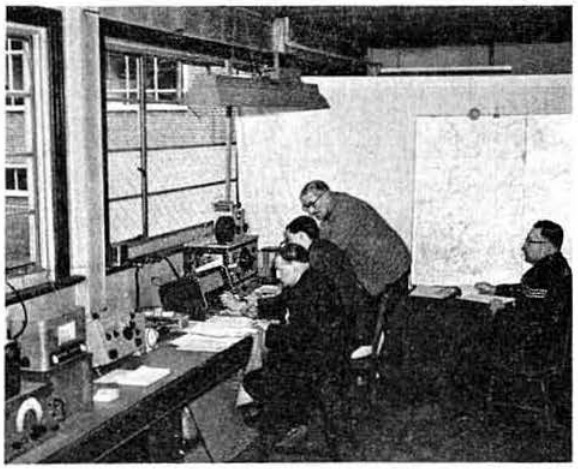
# R.A.E.N. Notes and News

**By E. ARNOLD MATTHEWS (G3FZW)** *

MIDLAND members may recall R.A.E.N. participation in a large-scale exercise held in Wolverhampton some 18 months ago, when many services combined in a test of the capabilities of a civilian casualty clearing station, and involved the movement of some 600 " casualties." A similar, but much larger exercise was held in Coventry on April 9, 1961, and amateurs were again called upon to provide communications for the British Red Cross whose Coventry division acted as directing staff. Initial approach to the amateurs was made through the Coventry T.R., who contacted local societies and **Warwickshire** R.A.E.N. A joint meeting of interested bodies made detailed arrangements for the provision of six stations required in and around Coventry. Each station had a main equipment and standby operating on 160m and an auxiliary equipment on 2m.

The general story of the exercise was that the south side of the city was presumed devastated and on fire. A Forward Medical Aid Unit had been established in the vicinity for the reception and treatment of casualties numbering no less than 3,600.

Incoming R.A.E.N. units from **Birmingham** and **Rugby** were met at the outskirts of Coventry by local amateurs, and guided to their destinations at 09.00. Although the exercise was not scheduled to commence until 11.30 traffic was being received



*During Essex Group's exercise " March Hare " an R.A.E.N. station was in operation at Police Headquarters, Chelmsford. From left to right, C. H. L. Edwards, G8TL (County Controller), A. W. Butcher, G3KPJ, M. D. W. Davies, G3MWD (A.C., Chelmsford) and Sgt. R. Hodson.*

shortly after links had been tested at 10.30, and from then on messages were being sent steadily until lunchtime, after which traffic became heavy and it became necessary to use two channels simultaneously in order to cope. The average time taken from origination of a message to placing a reply in the hands of the originator was four minutes, this time including twice covering the 200 yd. between the controlling officer and the signal office at the exercise control H.Q.

Communications were " 5 and 9 " all round, and operations went smoothly, so that at the conclusion the B.R.C.S. Deputy Branch Director, Mr. L. Banbury, said that this was the first occasion he had had the facility of radio, but he could not have discharged his duties so well without it and the success of his part of the exercise was in no small measure due to the signals facilities put at his disposal.

Stations active in this scheme were G2LU, G3GBE, G3HVU, G3HGY, G3HLI, G3DKF, G3APA, G3CZS, G3OVQ, G3NQA, G3CQD, G3IKL, G3LNN, G3BA, G3MVT, G3AYJ, G2DCI, G3JPN and G3CNV. Considerable interest was aroused, and there is a strong desire on the part of both amateurs and Red Cross for further exercises in the near future.

R.A.E.N. and non-R.A.E.N. amateurs worked well together and the results are proof of the statement made to the writer some years ago by Coventry amateurs that they would not be found wanting if called upon to supply emergency communications.

### Interest in the South-West

Although small in numbers, members in **Somerset** are active and showing enthusiasm for their work in a district whose terrain is not conducive to easy local working. On April 15 a demonstration was given to B.R.C.S. at Keynsham, when G3NXU and G3LYW operated mobile to provide a link between B.R.C.S. H.Q. and the scene of a supposed air crash.

A week previously, G3NXU, G3LYN, G3LYW and B.R.S.751 held an exercise to test a route for a link from Dorset to North Somerset and invented an interesting narrative for the purpose. Listener members in the area made recordings of the exercise and these were later played back at the " inquest." Also active with the group is G3NVY who operates low power portable.

**Dorset** Group will shortly be holding a joint exercise with the Somerset group, when Bristol will be linked with the South Coast.

### Further Progress in Manchester

The Chief Constable of Manchester has approved a scheme submitted by the A.C., G6DN, and it is hoped to instal the group's control station in Police H.Q., using the call-sign G6OM/A. Recruiting is proceeding well and practise nets are in regular operation.

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### Radio Telescope for D.S.I.R.

A FULLY-STEERABLE radio telescope is to be built at a site near Crowthorne, Berkshire, for the Radio Research Station of the Department of Scientific and Industrial Research. It is expected to be in operation towards the end of 1963.

The radio telescope, which will have a parabolic aerial about 80 ft. in diameter, is needed by D.S.I.R.'s radio scientists for their work in the space research programme and to study certain other aspects of radio science. It will have high accuracy and a faster tracking speed than the 250 ft. radio telescope at Jodrell Bank, an essential requirement for following earth satellites and determining orbital data. It will be used to receive weak u.h.f. signals from distant space vehicles.

In the field of radio astronomy, an application of the telescope will be a study of radio noise from the sun, including sudden increases in radio emission which are related to disruption in shortwave communications. The telescope will also be valuable in extending investigations of the properties of the upper and lower atmospheres which are important in both terrestrial and space communications. This feature will assume even greater significance in the next few years when satellites for communications, as well as for research purposes are likely to come into use.

### Retrospect—No. 3

*The third of a series of edited extracts from the record of the Development of Wireless Telegraphy published in the 1922 edition of the " Year Book of Wireless Telegraphy and Telephony."*

**1883**

Thomas A. Edison discovered the emission of charged particles from a hot carbon filament which came to be termed the " Edison Effect."

**1885**

Thomas A. Edison, with the assistance of Messrs. Gilliland, Phelps and W. Smith, worked out a system of communication between railway stations and moving trains by means of induction and without the use of conducting wires.

* *1 Shortbutts Lane, Lichfield, Staffs.*

# Forthcoming Events

**Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the 18th of the month preceding publication. T.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. Regional Representatives are requested to set out the copy, preferably typed double spaced, in the style used below. Standing instructions for more than three months ahead cannot be accepted.**

## DATES FOR YOUR DIARY

**May 27.**—International V.H.F./U.H.F. Convention, London.
**May 28.**—Hunstanton Mobile Rally.
**May 28.**—Northern Mobile Radio Rally.
**May 28.**—Southern Counties Mobile Rally.
**June 11.**—Chilterns Mystery Mobile Rally.
**June 11.**—Harlow Mobile Rally.
**June 18.**—A.R.M.S. Rally at Barford St. John, near Banbury.
**June 25.**—Longleat Mobile Rally.
**July 8-9.**—South Birmingham Night Rally.
**July 9.**—South Shields Mobile Rally.
**August 12-13.**—Derby Mobile Rally and Hamfest.
**August 23-September 2.**—National Radio and Television Show, London.
**September 3.**—G6UT's "Ham Party."
**September 10.**—Region 11 O.R.M.
**September 10.**—National Mobile Rally at Woburn Abbey.
**September 16.**—Region 10 O.R.M. at Cardiff.
**September 17.**—Lincoln Mobile Rally and Hamfest.
**October 21-22.**—Scout Jamboree-on-the-Air.
**November 22-25.**—R.S.G.B. International Radio Hobbies Exhibition, London.

### REGION 1

**Ainsdale (A.R.C.).**—Wednesdays, 8 p.m., 37 Hawthorne Grove, Southport.
**Blackburn.**—Fridays, 8 p.m., West View Hotel, Revidge Road.
**Blackpool (B. & F.A.R.S.).**—Tuesdays, 8 p.m., Squires Gate Holiday Camp.
**Bury (B.R.S.).**—June 13 (Junk Sale), 8 p.m., Knowsley Hotel, Kay Gardens.
**Chester.**—Tuesdays, 8 p.m., Y.M.C.A.
**Liverpool (L. & D.A.R.S.).**—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
**Macclesfield.**—May 16, 30, June 13, 27, 42 Jordongate.
**Manchester (M. & D.A.R.S.).**—Wednesdays, 7.30 p.m., King George VI Club North Road, Moston, Manchester, 10. **(S.M.R.C.).**—Fridays, 7.30 p.m., Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield 14.
**Morecambe.**—June 7, 125 Regent Road.
**Preston.**—June 13, 27, St Paul's School, Pole Street.
**Southport (S.R.S.).**—Thursdays, 8 p.m., The Esplanade.
**Stockport (S.R.S.).**—May 24, June 7, 21, 8 p.m., Blossoms Hotel, Buxton Road.
**Wirral (W.A.R.S.).**—May 17, June 7, 21, 7.45 p.m., The Castle Hotel, Ivy Street, Birkenhead.

### REGION 2

**Barnsley.**—May 26 (Radio Quiz with prizes), June 9 ("Test Equipment," by W. W. Williams), 7.30 p.m., King George Hotel, Peel St.
**Bradford (B.A.R.S.).**—May 23 (Visit to Granada TV, Manchester), June 13 ("Model Aircraft," by D. Millard, G3OGV), 7.30 p.m., 66 Little Horton Lane.
**Halifax.**—June 6 ("Model Aircraft," by D. Millard), June 20 (Informal), 7.30 p.m., Sportsman Inn, Ogden.
**Leeds (L.A.R.S.).**—May 31 ("Home-built Transmitter," by J. Hey), June 7 (A.G.M.), Swarthmore Education Centre, 3 Woodhouse Square, Leeds 3. May 28, Northern Mobile Rally.
**Scarborough (S.A.R.S.).**—Thursdays, 7.30 p.m., Chapman's Yard, North Street, Scarborough.

### REGION 3

**Birmingham (Bournville).**—May 19, June 2, 7.30 p.m., Concert Hall, Cadbury Bros. Bournville. **(M.A.R.S.).**—May 16 (Lecture), 7.30 p.m., Midland Institute, Paradise Street, Birmingham.
**(Slade).**—May 19 (Map Reading for D/F), June 2, (Criss-Cross Quiz), June 16 (Transistors), 7.45 p.m., The Church House, High Street, Erdington. **(South).**—May 16 (Visit to "999"), May 18 (Electronic Brains), 7.30 p.m., Friends Meeting House, 220 Moseley Road, Birmingham. May 22, Exhibition station at Shirley Carnival.
**Cannock Chase.**—June 1, 8 p.m., Bridgetown Inn, Walsall Road, Bridgetown, Cannock.
**Stourbridge.**—June 6, 7.45 p.m. (Amateur Television lecture/demonstration), Foley College, Hagley Road, Stourbridge.
**Sutton Coldfield.**—May 25, (Film Show at Tom Parton's QTH), June 8 (Transistors), 7.30 p.m., 92 The Parade, Sutton Coldfield.
**Wolverhampton.**—May 15 (Annual Dinner), 8 p.m., Newbridge Hotel, Wolverhampton, May 29 (Rag Chew), June 12, 8 p.m., Neachells Cottage, Stockwell End, Tettenhall, Wolverhampton.

### REGION 4

**Derby (D. & D.A.R.S.).**—May 24 ("Simple All-band S.S.B. Exciter" by H. E. Jones, G3JXL), May 28 (Burton-on-Trent D/F Challenge Match), May 31 (Open Evening), June 7 (Surplus Sale), June 14, 7.30 p.m., Room No. 4, 119 Green Lane, Derby. **(D.S.W.Exp.S.).**—Fridays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Derby.
**Grimsby (A.R.S.).**—May 25 (N.F.D. Discussion), June 8 (Visit), June 22, 8 p.m., R.A.F.A. Headquarters, Abbey Drive West, Grimsby.
**Leicester (L.R.S.).**—Mondays, 7.30 p.m., (Morse Tuition 7.30-8.30 p.m.), Club Rooms, Old Hall Farm, Braunstone Lane, Leicester.
**Lincoln (L.S.W.C.).**—May 24 (Semi-conductors by Mr. Scholey), June 7, 7.30 p.m., Room No. 19, Technical College, Lincoln.
**Melton Mowbray (A.R.C.).**—May 25 (Shack Visit and General Discussion), 7.30 p.m., H. Grice (G3NBA), Oakham Road. Ashwell, Oakham, Rutland.
**Nottingham (A.R.C.N.).**—May 16 (R.S.G.B. Open Night), May 18 (Junk Sale), May 23 (Slow Morse for S.W.L.'s), May 25 (R.S.G.B. Open Night), May 30 (Slow Morse Practice for S.W.L.'s), June 1, 6, 8, 13, 15, 7.30 p.m., Community Centre, Woodthorpe House, Mansfield Road, Sherwood, Nottingham.
**Northampton (N.S.W.R.C.).**—Thursdays, 7 p.m., Allen's Pram Works, 8 Duke Street, Northampton.
**Peterborough (P. & D.A.R.S.).**—June 2 (Aerials), 7 p.m., Peterborough Technical College.
**Retford & Worksop (N.N.R.S.).**—Tuesdays (Construction and Beginners), Thursdays, 7.30 p.m., Club Rooms, Victoria Hall, Eastgate, Worksop, Notts.

### REGION 6

**Cheltenham.**—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
**Stroud.**—Wednesdays, 8 p.m., Subscription Rooms, Stroud.
**High Wycombe (Chiltern A.R.C.).**—May 25 (Beginners' Evening—"Introduction to the Short Waves"), 8 p.m., British Legion Hall, St. Mary Street, High Wycombe.
**Wolverton (W.D.R.C.).**—Fridays, 7.30 p.m., Science and Arts Institute, Church Street.

### REGION 7

**Acton, Brentford and Chiswick.**—May 16 (N.F.D. Briefing), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
**Barnet (B. & D.R.C.).**—May 30 ("Mobile Equipment" by V. A. Frisbee, G3KVF), June 27 ("V.H.F. Equipment," by T. H. A. Withers, G3HGE), 8 p.m., Red Lion Hotel, Barnet.
**Bexleyheath (N.K.R.S.).**—May 26 (Junk Sale and Final N.F.D. Arrangements), June 8 (N.F.D. Report), 8 p.m., Congregational Hall, Bexleyheath, (nr. Clock Tower).
**Croydon (S.R.C.C.).**—June 13, 7.30 p.m., "Blacksmith Arms," South End, Croydon.
**Dorking (D. & D.R.S.).**—Second and fourth Tuesday each month, 8 p.m., Star and Garter Hotel, Dorking.
**Ealing.**—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
**East Ham.**—Tuesdays, May 16, and fortnightly, 8 p.m., 12 Leigh Road, East Ham.
**East Molesey (T.V.A.R.T.S.).**—June 7, 8 p.m., Carnarvon Castle Hotel, Hampton Court.
**Enfield and District.**—May 25 (Annual Exhibition of Home Constructed Equipment), 7.30 p.m., George Spicer School, Southbury Road, Enfield.
**Harlow and District.**—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
**Holloway (G.R.S.).**—Mondays, Tuesdays and Wednesdays (R.A.E. and Morse), 7 p.m., Fridays (Club), 7.30 p.m., Montem School, Hornsey Road, Holloway N.7.
**Ilford.**—Thursdays, 8 p.m., 579 High Road, Ilford (near Seven Kings Station).
**Kingston.**—Lectures alternate Thursdays, Theory and Morse Classes weekly, 7.45 p.m., Y.M.C.A., Eden Street, Kingston (Morse at 2, Sunray Avenue, Tolworth).
**New Cross (C.A.R.S.).**—Fridays. 7.30 p.m., Sundays, 11.30 a.m., Wednesdays (Morse Practice), 8 p.m., 225 New Cross Road, London, S.E.14. May 19, "TW V.H.F. Equipment," by T. Withers, G3HGE.
**Paddington (P. & D.A.R.S.).**—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.
**Purley (P. & D.R.C.).**—May 19 (A.G.M.), 8 p.m., Railwaymen's Hall, Whytecliffe Road, Purley.
**Romford (R. & D.R.S.).**—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
**South Kensington (C.S.R.S.).**—May 16 (Films and Taped Lecture on Receivers), 6 p.m., Science Museum, South Kensington.

**LONDON MEMBERS' LUNCHEON CLUB**

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

**at 12.30 p.m. on Friday, May 19, June 16 and July 21, 1961**

Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

**South London (C.P. & D.R.C.).**—June 6 (Morse Class), 8 p.m., at G3IIR's QTH. First Tuesday and third Saturday each month, 8 p.m., Windermere House Annex, Westow Street, Crystal Palace. May 20 ("Three years in New Zealand" by R. T. Reed, G2RX).
**Welwyn Garden City.**—June 8 ("Inquest on N.F.D."), 8 p.m., Television School, Murphy Radio Ltd., Bessemer Road.

### REGION 8

**Crawley (C.A.R.C.).**—May 24 (N.F.D. Arrangements), 8 p.m., West Green Centre, Crawley.
**Tunbridge Wells (W.K.A.R.S.).**—May 26 (N.F.D. Arrangements), June 9 ("Crystals and Their Uses," by W. H. Allen, M.B.E., G2UJ, and R. Trevitt), June 23 (Informal), 7.30 p.m., Kent County Council Adult Centre, Culverden House, Culverden Park Road, Tunbridge Wells.

### REGION 9

**Bath.**—May 29, 7.30 p.m., Committee Room, Bath Technical College.
**Bideford.**—First Thursday in each month, 7.30 p.m., alternately at T. G. Ward (G2FKO), 38 Clovelly Road, (Phone: Bideford 964) and D. H. Jones (G3BO), Rosebank, Westcombe (Phone: Bideford 550).
**Bristol.**—May 19 ("The Birdcage Aerial" by G. A. Bird, G4ZU), 7.15 p.m., Carwardines Restaurant, Baldwin Street, Bristol 1.

*(Continued on page 537)*

**Exeter.**—Second Thursday in each month, 8 p.m., Y.M.C.A., St. David's Hill, Exeter.
**Falmouth.**—First Wednesday in each month, Y.M.C.A., Falmouth.
**Plymouth (P.R.C.).**—Tuesdays, 7.30 p.m., Virginia House Settlement, St. Andrews Cross.
**Torquay (T.A.R.S.).**—Second Saturday in each month, 7.30 p.m., Y.M.C.A., The Castle, Torquay.
**Weston-super-Mare.**—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road, Weston-super-Mare.
**Yeovil (Y.A.R.C.).**—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

**REGION 10**

**Cardiff.**—June 12 (" Aerials," by A. J. Crookes, GW3ALV), 7.30 p.m., T.A. Centre, Park Street, Cardiff.
**Penarth.**—May 29 (N.F.D. Arrangements), 7.30 p.m., R.A.F.A. Club, Windsor Road, Penarth.
**Port Talbot (P.T.R.C.).**—June 13, 7.30 p.m., Rail and Transport Club and Institute, Station Road, Port Talbot.

**REGION 11**

**Rhyl (F.R.S.).**—May 29 (Final N.F.D. Arrangements), 7.30 p.m., Bee Hotel, Rhyl.

**REGION 12**

**Aberdeen (A.A.R.S.).**—May 19 (" Uses for the 1 in. C.R.T."), May 26 (Final N.F.D. Arrangements), June 2 (N.F.D. Packing), June 9 (" Electronic TR Switches "), June 16 (Grand Surplus Sale), 7.30 p.m., 6 Blenheim Lane, Aberdeen.

**REGION 13**

**Edinburgh (L.R.S.).**—May 25 (N.F.D. Briefing), June 8 (Constructional Competition), 7.30 p.m., Y.M.C.A., 14 St. Andrew Street, Edinburgh 2.

**REGION 14**

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

**REGION 16**

**Chelmsford.**—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane.

**REGION 17**

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

# Regional and Club News

**Bristol.**—There was an attendance of 60 at Carwardine's Restaurant when R. G. Shears (G8KW) gave a lecture and demonstration of the K.W. Viceroy S.S.B. transmitter and the new K.W. Top Band transmitter. A film show arranged by Mullard Ltd. was due to take place at the Grand Hotel, Bristol, on May 5, in conjunction with the Bristol Group of the Television Society. It is hoped to demonstrate live Amateur Television at the Longleat Mobile Rally on Sunday, June 25. *Hon. Secretary:* R. L. Shaddick (B.R.S.19727), 2 Shanklin Drive, Filton, Bristol.

**Cambridge and District Amateur Radio Club.**—At the A.G.M. in March the following were elected: *President*—S. J. Granfield (G5BQ); *Chairman*—F. W. Crabtree (G3BK); *Hon. Secretary*—A. H. G. Waton (G3GGJ), " Arkengarthdale," New Road, Barton, Cambridge. Meetings continue to be held at " The Jolly Waterman," Chesterton Road, Cambridge.

**Civil Service Radio Society.**—The winter programme of lectures ended on May 2 with a talk on the R.S.G.B. National Convention, 1960, by G. Voller (G3JUL). Informal meetings will be held on the third Tuesday in each month during the summer. Visits to places of radio interest are also being arranged. Details of membership may be obtained from the *Hon. Secretary:* G. Lloyd-Dalton, 2 Honister Heights, Purley.

**Clifton Amateur Radio Society.**—The second round of the inter-club quiz with the Crystal Palace and District Radio Club was won by the society's team who were the overall winners by a narrow margin. The second annual lecture on D/F was given by G3HZI on April 21 and it is hoped that more activity will result.

*At a recent meeting in Forfar, Mr. Walter Robertson, GM6RI (right) was presented with the Maitland Trophy by Mr. E. G. Ingram, GM6IZ (Executive Vice-President and Zone F Representative). Others present included GM2HIK, GM3GUI, GM3HTL and GM3BCL.*

*Hon. Secretary:* C. Bullivant (G3DIC), 25 St. Fillans Road, London, S.E.6.

**Cornish Radio and Television Club.**—At the A.G.M. the following were elected: *President*—L. Rogers (G2FQD); *Chairman*—J. Watson (G3AET); *Hon. Treasurer*—Mrs. W. Locke; *Hon. Secretary*—W. J. Gilbert, 7 Poltair Road, Penryn. The G2AYQ Shield and G2FHB Cup were presented to C. Bowden (G3OCB), the Shiela Locke Shield and John Bray Cup to W. J. Gilbert, Jnr., and the Norman Elliott Cup to J. Brown (G3LPB) for his work for the club. At the conclusion of the business meeting, two Mullard films were shown.

**Crawley Amateur Radio Club.**—Arrangements for N.F.D. will be discussed at the meeting on May 24. Members recently visited the Croydon station of the I.T.A., by courtesy of the Engineer-in-Charge. A DXpedition to Hereford, with operation on 1·8 and 144 Mc/s, is being planned for September. *Hon. Secretary:* R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley.

**Grantham.**—A new society has been formed in Grantham and prospective members may obtain information from the *Hon. Secretary:* I. Allen Brown (G3OWR), 21 Beechcroft Road, Grantham.

**Halifax and District Amateur Radio Society.**—Meetings at the new venue, the Beehive and Crosskeys Inn, Halifax, have been arranged for June 20 (Informal) and July 4 (Junk Sale). *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

**Harrow, Radio Society of.**—Meetings are held on Fridays at 8 p.m. in the Science Lab. at Roxeth Manor Secondary School, Eastcote Lane, South Harrow. May 19 will be a Practical Night while a film show is being arranged for May 26. Meetings are preceded by a Top Band net. *Hon. Secretary:* S. C. J. Phillips, 131 Belmont Road, Harrow Weald.

**Hastings and District Amateur Radio Club.**—A coach tour to the Southern Counties Mobile Rally at Beaulieu Abbey is being arranged for May 28 and it is hoped that G6HH/M will be in operation. Meetings will be held on May 23 (" Component Courpendium No. 2—Capacitors "), June 6 (" Our DL Tour," by G3HRI and G3MQT) and on June 20 (Tape Quiz and Junk Sale). *Hon. Secretary:* W. E. Thompson (G3MQT), 8 Coventry Road, St. Leonards-on-Sea.

**Lowestoft Amateur Radio Club.**—On June 1-2, the club will be operating G3IFI/A on all bands from 1·8-21 Mc/s and G3IAO/A on 145·1 Mc/s using A1, A3 and RTTY from the Hobbies and Careers Exhibition at the Technical College, St. Peters Road, Lowestoft. Contacts will be welcome.

**Mitcham and District Radio Society.**—A talk on the Birdcage aerial by G4ZU, a Junk Sale and arrangements for N.F.D. have all figured in the recent programme. On June 2 at " The Cannons," Madeira Road, Mitcham, G3DWW will give a demonstration entitled " Recorded Noises." *Hon. Secretary:* M. Pharaoh (G3LCH), 1 Madeira Road, Mitcham.

**North Kent Radio Society.**—G3ENT/A will be active from the Commonwealth Technical Training Week Careers Exhibition at Crayford Town Hall from May 29 to June 3. Operation will mainly be on 7 Mc/s (afternoons) and on Top Band (evenings). *Hon. Secretary:* D. Wooderson (G3HKX), 75 Mount Road, Bexleyheath, Kent.

**Northern Heights Amateur Radio Society.**—This new society meets on alternate Wednesdays at 7.45 p.m. at the Sportsman Inn, Ogden, Halifax. The chairman is C. Longman (G2DYY). Prospective members may obtain further information from the *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

**Stevenage and District Amateur Radio Club.**—In connection with the Stevenage Day celebrations on June 10, the club will be operating GB3SAD on Top Band, 14 Mc/s and 144 Mc/s. *Hon. Secretary:* A. E. Lalham, 138 Broadwater Crescent, Stevenage.

**Stoke-on-Trent Amateur Radio Society.**—The following were elected at the A.G.M.: *President*—K. Parkes (G3EHM); *Chairman*—V. Bloor (G3UD); *Hon. Treasurer*—V. Reynolds (G3COY); *Hon. Secretary*—J. Brindley (G3DML), 40 Milehouse Lane, Newcastle, Staffs. Prospective members are invited to contact the *Assistant Hon. Secretary:* A. Bucknall, 35 Freehold Street, Newcastle, Staffs.

**Surrey Radio Contact Club.**—At the A.G.M. the following were elected: *Chairman*—B. W. Wynn (G8TB); *Vice-Chairman*—R. E. Dabbs (G2RD); *Hon. Treasurer*—J. North (B.R.S.18032); *Committee Members*—A. Naylor (G3GHI), A. M. Smith (G3IAS), R. I. Richardson (G3KXT) and L. C. Mansfield (G3LCM/T). The *Hon. Secretary*, S. A. Morley (G3FWR), 22 Old Farleigh Road, Selsdon, Croydon, was re-elected and having completed 10 years in office was proposed for Honorary Life Membership. The membership now stands at 76, of whom the majority are R.S.G.B. members.

**Thames Valley Amateur Radio Transmitters Society.**—At the April meeting G3FP gave an interesting and instructive talk on "Simple Equipment for 30 cm." Contact with G5DT and G2FN was made from the lecture room. All shortwave listeners and those anxious to obtain transmitting licences will be most welcome at meetings. Help and guidance is available to those requiring it. *Hon. Secretary:* K. Rogers (G3AIU), 21 Links Road, Epsom.

**Torbay Amateur Radio Society.**—At the A.G.M., the following officers were elected: *President*—W. Sydenham, B.Sc. (G5SY); *Vice-Presidents*—F. Wadman (G2GK), D. Cawley (G2GM), L. Webber (G3GDW); *Chairman*—E. J. Hayman (G3ABU); *Vice-Chairman*—D. Webber (G3LHJ); *Hon. Treasurer*—R. Luscombe (G3MEP); *Hon. Secretary:* Mrs. G. L. Western (G3NQD), 118 Salisbury Avenue, Barton, Torquay; *Hon. Auditor*—A. Bullock (G3IEA); *Experimental Manager*—E. J. Hayman (G3ABU). It was reported that the society had had a successful year and that 26 of the 45 members were licensed.

**Wirral Amateur Radio Society.**—The DXpedition to Carmarthenshire took place as planned and created much interest, although the site and the weather were not as good as were hoped for. Details of future activities are given in *Forthcoming Events*. *Hon. Secretary:* A. Seed (G3FOO), 31 Withert Avenue, Bebington.

## W. W. Burnham

THE death occurred on Easter Monday, 1961, of Mr. W. W. Burnham. Licensed in 1920 as G2FQ, Mr. Burnham later became a leading figure in the radio industry. He was a member of the London Wireless Club and of the Wireless Society of London, and as a member of the British Broadcasting Company he helped in the selection of Mr. John Reith (now Lord Reith) as its General Manager.

## Can You Help?

● D. M. Pratt (G3KEP), 30 Lyndale Road, Bingley, Yorkshire, who wishes to obtain the handbook or any circuit information for the S.T.C. Communications Receiver Type 3-EL-19N?

● R. J. Richards (B.R.S.22566), Glynogwr, Blackmill, near Bridgend, Glamorgan, who requires the circuit diagram of the Hallicrafters SX28 receiver and winding details of the oscillator coil for the 1·6-3 Mc/s range?

● David N. Thompson (G3OXG/T), 74 Archers Way, Letchworth, Herts., who requires information on the U.S. Army Frequency Meter type BC906D and wishes to know whether it can be modified for 420 Mc/s?

● J. Longan (A.2578), 5 Shelley Grove, Southport, Lancashire, who requires the circuit and any other information on the ex-R.A.F. Receiver R.1475 (or Type 88) and the Collins TCS12 Transmitter-Receiver.

*Cup winner in the 1961 Constructor's Competition organized by the Welwyn Garden City Group was Geoff Cochrane (G3LLF), here seen with the very useful piece of test equipment which won him the "Stanley Harrison Challenge Trophy," awarded for annual competition by G3EPK of Hertford*

## Representation

THE following are additions or alterations to the list of Town Representations published in the December, 1959 issue.

REGION 15—BELFAST
S. H. Foster (GI3GAL), 31 Belmont Park.

**Vacancy**
Mr. D. T. Wyatt (G3LSC) has resigned as representative for Poole. Nominations for his successor should be made in the prescribed form and sent to reach the General Secretary by not later than June 30, 1961.

**Change of Address**
The address of Mr. H. Bellairs (G3LXX), County Representative for Lincolnshire, is now 49 Springfield Road, Scarthoe, Grimsby.

## Affiliated Society Representatives

THE following are additions to the list of Affiliated Society Representatives published in the December, 1960 issue.

BRADFORD RADIO SOCIETY: M. T. G. Powell (G3NNO), 28 Gledhow Avenue, Roundhay, Leeds, 8.

FLINTSHIRE RADIO SOCIETY: J. Thornton Lawrence (GW3JGA), Perran Porth, East Avenue, Prestatyn.

## Learning Morse

A NEW and revised edition of this well-known Iliffe publication is now available from R.S.G.B. Headquarters, price 1/10d. post free.

The booklet—written by former *Wireless World* Editor, H. F. Smith—gives methods of learning the code, key manipulation and methods of practice. The revised Q Code as approved at the Geneva Radio Conference 1959 is included, together with a series of practice groups and rythmic groups.

## Trader Year Book

THE 31st (1961) edition of the *Wireless and Electrical Trader Year Book* is now available price 15s. from Iliffe Books Ltd., Dorset House, Stamford Street, London, S.E.1. The *Year Book* provides an up-to-date legal, technical and buying guide for the radio, television and domestic electrical industries. It is compiled in collaboration with the staff of *Wireless and Electrical Trader*.

# Slow Morse Practice Transmissions

| Time | Call-sign | kc/s | Town |
|---|---|---|---|
| **Sundays** | | | |
| 09.00 | G3BHS | 1810 | Southampton |
| 09.30 | G3HNJ, G3OFP, G3OMJ | 1840 | Doncaster |
| 10.15 | G3CGD | 1875 | Cheltenham |
| 11.00 | G3GZE | 1840 | Blackburn |
| 11.00 | G2FXA | 1900 | Stockton-on-Tees |
| 11.00 | G3HZM | 1860 | Manchester |
| 11.00 | G3NXQ | 1850 | Warndon, Worcs. |
| 12.00 † | G3HVI, G3IVB, G3OGD | 1920 | Stoke-on-Trent |
| 12.00 | G15UR | 1860 | Belfast |
| 18.00 | G3OGO | 1925 | Croydon |
| 20.00 | G3MRA | 1915 | Southampton |
| 20.30 | G3HTA | 1850 | Exeter |
| **Mondays** | | | |
| 18.30 | G3NC | 1825 | Swindon |
| 19.00 | G3KTP | 1850 | Heanor, Derby |
| 19.00 | G3LMT | 1850 | Exeter |
| 20.00 | G3BMY | 1838 | Birmingham |
| 20.00 | G3GZE | 1840 | Blackburn |
| 20.00 | G3MDH | 1915 | Southampton |
| 20.30 | G3AGN | 1875 | Felixstowe |
| 20.30 | G3MXI | 1910 | Derby |
| 21.30 † | G3IRM, G3MWO | 1981 | Bury St. Edmunds |
| 21.30 † | G3LGK, G3MXI | 1980 | Ilkeston, Derbys. |
| 21.30 | G3NOE | 1900 | Bradford |
| **Tuesdays** | | | |
| 17.30 | G2AAM | 1875 | Swanwick, Derbys. |
| 18.00 | G3GZE | 1840 | Blackburn |
| 18.30 | G2FXA | 1900 | Stockton-on-Tees |
| 19.30 | G3IAG | 1930 | Littleport, Cambs. |
| 20.00 | G2FCI | 1850 | Exeter |
| 20.00 | G3IBI | 1915 | Southampton |
| 20.00 | G3NHR | 1900 | Hounslow |
| 20.15 | G2AYQ | 1875 | St. Agnes, Cornwall |
| 20.30 | G3MEH | 1900 | Old Coulsdon, Surrey |
| 20.30 | G3NKX | 1875 | Loughton |
| 21.00 | G3EFA | 1855 | Southport |
| 21.00 | G3LSC, G3MKN, G3NUN | 1875 | Poole |
| 21.15 | G2CPL | 1875 | Felixstowe |
| 21.45 | G2UK | 1875 | Lowestoft |
| 22.00 | G2CZU | 1900 | Bath |
| 22.00 | G3AWL | 1980 | Wingate, Co. Durham |
| **Wednesdays** | | | |
| 19.00 † | G3MCJ, G3FLK, G2FCI, G3HTA | 1845 | Exeter |
| 19.00 | G3LZC | 1830 | Heanor, Derby |
| 19.00 | G8RQ | 1850 | Chesterfield |
| 19.30 | G2BSQ | 1930 | Ashtead, Surrey |
| 19.30 | G3IAG | 1930 | Littleport, Cambs. |
| 19.30 | G3NQR | 1875 | Harrow Weald |
| **Wednesdays** | | | |
| 19.45 | G3KFE | 1950 | Stevenage |
| 20.00 | G3BHS | 1915 | Southampton |
| 20.00 | G3GZE | 1840 | Blackburn |
| 20.00 † | G2FYT, G2HDR, G3IZM, G3OLB | 1910 | Bristol |
| 20.15 | G2AYQ | 1875 | St. Agnes, Cornwall |
| 20.30 | G3MXI | 1910 | Derby |
| 21.00 † | G3HVI, G3IVB, G3OGD | 1920 | Stoke-on-Trent |
| 21.00 | G3LSC, G3MKN, G3MXF | 1875 | Poole |
| 21.00 | G3AGX | 1920 | Hull |
| 22.00 | | | |
| 21.30 | G3HNJ, G3OFP, G3OMJ | 1840 | Doncaster |
| 21.30 | G3NOE | 1900 | Bradford |
| 22.00 † | G3LGK, G3MXI | 1980 | Ilkeston, Derbys. |
| 22.00 | G3NXQ | 1850 | Warndon, Worcs. |
| **Thursdays** | | | |
| 17.30 | G2AAM | 1981 | Swanwick, Derbys. |
| 18.30 | G3NC | 1825 | Swindon |
| 19.30 | G3IAG | 1930 | Littleport, Cambs. |
| 20.00 | G3NBV | 1915 | Southampton |
| 20.00 | G3NHR | 1900 | Hounslow |
| 20.00 | G3NRW | 1930 | Chelmsford |
| 20.15 | G2AYQ | 1875 | St. Agnes, Cornwall |
| 21.30 | G3HMY | 1850 | Exeter |
| 21.30 † | G3IRM, G3MWO | 1981 | Bury St. Edmunds |
| 22.00 | G2CZU | 1900 | Bath |
| 22.00 | G3AWL | 1980 | Wingate, Co. Durham |
| **Fridays** | | | |
| 18.30 | G3DMN, G3FVP | 1880 | Ipswich |
| 19.00 | G3JKY | 1900 | Beckenham |
| 19.30 | G3FUA | 1850 | Kilburn, Derby |
| 19.30 | G3IAG | 1930 | Littleport, Cambs. |
| 19.30 | G3MHR | 1850 | Swanwick, Derbys. |
| 20.00 | G2BOJ, G3NXZ | 1840 | Doncaster |
| 20.00 | G3JQS | 1915 | Totton |
| 20.00 | G3NYB, G3NXZ | 1980 | Doncaster |
| 20.15 | G2AYQ | 1875 | St. Agnes, Cornwall |
| 20.30 | G3ICX | 1915 | Sutton Coldfield |
| 20.30 | G3KGU | 1915 | Theydon Bois, Essex |
| 21.30 † | G3NPO, G3KSS | 1900 | Bradford |
| 22.00 † | G3LGK, G3MXI | 1980 | Ilkeston, Derbys. |
| | | 1980 | West Hallam, Derbys. |
| **Saturdays** | | | |
| 13.00 | G2FXA | 1900 | Stockton-on-Tees |
| 20.00 | G3MCL | 1915 | Southampton |

† *Alternately*

*Alterations and additions to this list should be sent to the Honorary Organizer, C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex.*

## R.S.G.B. QSL Bureau Sub-Managers

THE following is a list of the R.S.G.B. QSL Bureau Sub-Managers showing the call-sign groups for which they are responsible:

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| **G2 and DL2 calls:** | **G. Verrill (G3IEC), 10 Seahorse Street, Gosport, Hants. (Certificates Manager.)** |
| **G3, 4 and 5 two-letter calls & GC** | **E. G. Allen (G3DRN), 65a Melbury Gardens, London, S.W.20.** |
| **G6 and G8 calls:** | **A. J. Mathews (G6QM), 62 Ashlands Road, Hesters Way Estate, Cheltenham.** |
| **G3AAA-BZZ:** | **C. C. Olley (G3AIZ), 157 Wanstead Park Road, Ilford, Essex.** |
| **G3CAA-DZZ:** | **C. A. Bradbury (B.R.S. 1066), 13 Salisbury Avenue, Cheltenham.** |
| **G3EAA-HZZ:** | **W. J. Green (G3FBA), 790 Rochester Way, Sidcup, Kent.** |
| **G3IAA-KZZ, B.R.S. and A numbers** | **T. D. J. Miles (G3NXR), 7 Hampden Road, Wantage, Berks.** |
| **G3LAA-MZZ:** | **G. C. Voller (G3JUL), 13 Marlborough Road, Ashford, Middlesex.** |
| **G3NAA-OZZ:** | **G. Verrill (G3IEC), 10 Seahorse Street, Gosport, Hants.** |
| **GD calls:** | **T. R. Moore (GD3ENK), "Glyn Moar," St. John's, Isle of Man.** |
| **GI calls:** | **W. H. Martin (GI5HV), "Swallow Lodge," Greenisland, Co. Antrim, Northern Ireland.** |
| **GM calls:** | **D. Macadie (GM6MD), 154 Kingsacre Road, Glasgow, S.4.** |
| **GW calls:** | **J. L. Reid (GW3ANU), 28 Waterston Road, Gabalfa, Cardiff.** |

Envelopes for the *collection* of cards may be sent direct to the Sub-Manager concerned or to the QSL Manager (Mr. A. O. Milne). Outgoing cards should NOT be sent to the Sub-Manager unless they are in the call-sign group for which he holds envelopes. For example, the holder of a G3J- call may send cards for calls in the series G3IAA-G3KZZ to his own Sub-Manager, together with envelopes for the collection of cards, but he should not send to him cards in any other call-sign series. Sending cards for general distribution to the Sub-Managers only involves the cards in delay and the Society in needless expense.

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| OB3 | 8/– | 6AG7 | 7/6 |
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| 1L4 | 3/6 | 6AQ5 | 7/– |
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| 1S4 | 6/– | 6B8 | 6/– |
| 1S5 | 6/– | 6B8G | 3/– |
| 1T4 | 4/– | 6BA6 | 6/– |
| 1U5 | 6/– | 6BE6 | 6/– |
| 1V | 4/– | 6BF6 | 5/– |
| 2A3 | 5/– | 6C4 | 2/6 |
| 2C26A | 5/– | 6C5G | 5/– |
| 2C34 | 4/6 | 6C6 | 4/– |
| 2C51 | 15/– | 6C8G | 7/– |
| 2D21 | 6/– | 6CH6 | 6/– |
| 2X2 | 4/– | 6E5 | 7/– |
| 2X2A | 7/– | 6F6 | 5/– |
| 3A4 | 5/– | 6F7 | 6/– |
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| 3Q4 | 7/– | 6J6 | 3/6 |
| 3S4 | 5/– | 6K7 | 4/– |
| 3V4 | 6/6 | 6L5G | 6/– |
| 5R4GY | 9/– | 6L6 | 9/– |
| 5T4 | 9/– | 6L6G | 7/– |
| 5U4G | 5/– | 6L7 | 5/– |
| 5V4G | 10/– | 6N7 | 6/– |
| 5Y3GT | 6/– | 6Q7G | 6/– |
| 5Z3 | 7/– | 6SA7GT | 7/– |
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