R S G B

MAY, 1959

BULLETIN

2/6 Monthly

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOL. 34, NO. 11

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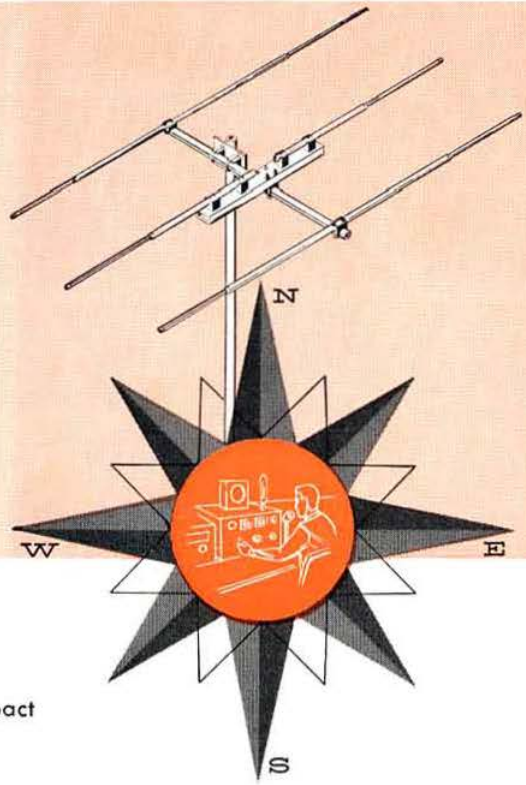

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RADIO — OFFICIAL JOURNAL — RSGB BULLETIN

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G.3DO.

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0 — 250 V.		
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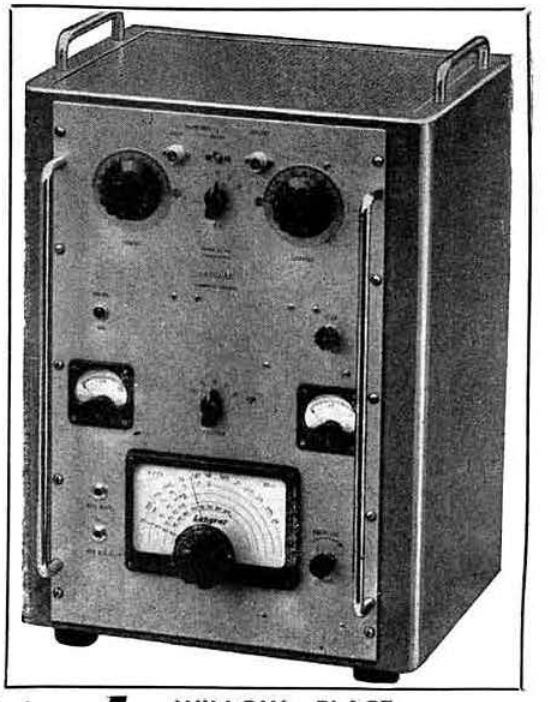

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Volume 34 No. 11
May 1959

R.S.G.B. BULLETIN

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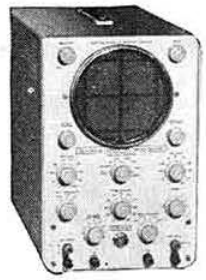

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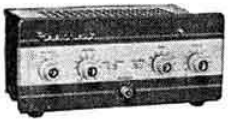

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Current Comment

discusses topics of the day

National Field Day

THE fascination of National Field Day continues. Amateurs who seldom operate their own station from one year to the next can be depended upon to put in a full stint on the key during N.F.D. weekend. Where lies the fascination? Surely it can be found in the team spirit that abounds on such occasions.

From the highly organized group with a dozen operators and a score of willing helpers to the small three-man group in a remote country district, it is team spirit that counts.

National Field Day calls for technical skill and operating ability, both of which will be in abundant evidence during N.F.D. weekend next month. There are some who incline to the view that the event has lost some of its earlier appeal because certain stations are far from portable but against that there is the knowledge that N.F.D. has provided a challenge to produce highly efficient equipment.

Whilst the pattern of Field Day is unlikely to change, materially, in the course of the next few years it is interesting to speculate what results could be achieved today if operation was confined to the use of transistorized equipment. Given an open site and a good aerial system it is reasonable to assume that quite long distances could be covered on Top Band and on 80m, but some time must pass before transistors become available for efficient r.f. operation on the normal DX communication bands. Notwithstanding present technical limitations perhaps the forthcoming National Field Day will provide some members with an opportunity of testing transistorized equipment from attractive sites. An article in this issue describes a transistorized power supply which should prove helpful to groups interested in conserving precious battery power.

National Field Day has always been the most corporate effort in the Society's year—1959 will be no exception, because there are indications that a great many groups and clubs will be participating. Since last June many hundreds of new members have joined the Society. Whilst no Field Day team can hope to achieve success if its efforts are hampered by sightseers, no newly-elected member who is keen to see how N.F.D. operates should be put off from visiting his nearest N.F.D. site.

May the sun shine during the first weekend in June.

Mobile

CLOSELY allied to Field Day activities is mobile operation, one of the newer facets of Amateur Radio in the United Kingdom. Since the Post Office decided to permit amateurs to use radio equipment installed in vehicles, interest in the particular challenge which operation on-the-move presents has grown rapidly amongst all types of radio amateur, Top Band man, DX worker and v.h.f. enthusiast alike, for mobile offers them all a new dimension in the fun to be obtained from their hobby. Each succeeding spring sees an increasing number of amateurs taking to the roads in cars decorated with a wonderful variety of loaded whips, crossed dipoles, haloes and capacity hats.

People of like interests invariably enjoy meeting one another, none more than the " mobilers," as has been conclusively shown by the continuing success of the many informal rallies held each year throughout the country. No other section of the movement has ever attracted attendances of up to 1,000 at social or technical gatherings but many mobile rallies can now claim to be able to do so. The success of these rallies, which possess in varying degree the characteristics of hamfest, Convention, technical seminar and garden party, lies in the highly organized informality that exists. Months of preparation go into the arrangement of events of this nature to ensure that everyone has a good time without ever getting the *feeling* he is being " organized."

If the advent of the Amateur (Sound Mobile) Licence has done nothing else, it has brought renewed life to the spirit of friendship which epitomizes Amateur Radio.

Preserving the Record

AN impending move from one part of London to another last month brought to light a bundle of pre-war photographs, mostly of Amateur Radio stations. Looking through those pictures brought back nostalgic memories of many who played an important part in helping to create the tradition of which the Society can now be justly proud. Some have passed on, others, fortunately, are still with us.

How easy it is to forget what people and places looked like only 20 years ago. In the field of Amateur Radio the Society's Journal has preserved the main record but there must have been many events in the past which have passed, unnoticed, from the scene.

Today, almost every local group and certainly every affiliated society operates through a committee. The appointment of one member to act as group or society historian would be a simple and effective method of ensuring that a record of local activities is properly preserved. Future generations of amateurs will thank those who had the foresight to make such an appointment.

Series Gate Modulation

By P. J. H. MATTHEWS (G3BPM)*

LATE in 1957 the writer's attention was drawn to an article in *Electronics* which described a simple, economical and effective form of modulation known as "series gate." In view of the various advantages claimed for it a number of tests and experiments were carried out to ascertain whether it would be effective in amateur service. The tests and experiments have proved successful and both theoretical and practical details will be given for anyone wishing to adopt the system.

The name "series gate modulation" in itself does not clearly convey the way the system operates but is the name given by the originator. It has been retained to identify this method clearly and distinctly from either screen or control carrier modulation, although the "series gate" system is in fact a most effective combination of the two.

The advantages of this method are:

(i) Ability to modulate fully any transmitter (using beam tetrodes) of up to 250 watts input with a very simple circuit.

(ii) Power requirements for the modulator are extremely small; it is therefore useful for mobile purposes.

(iii) Cheap to build when compared with the normal heavy duty anode and screen modulator as no iron cored components are required; the valve types used are commonly available.

(iv) Physically much smaller and more compact than a normal modulator, again making it ideal for mobile use.

(v) Easily built into any existing c.w. transmitter.

(vi) Automatic speech clipping if required without the use of an expensive and complicated low pass filter.

Principle of Operation

The basic circuit is shown in Fig. 1 and comprises one valve only, a double triode. The circuit is essentially a voltage amplifier VA directly coupled to a cathode follower VB. This circuit operates as a d.c. amplifier and as an a.c.

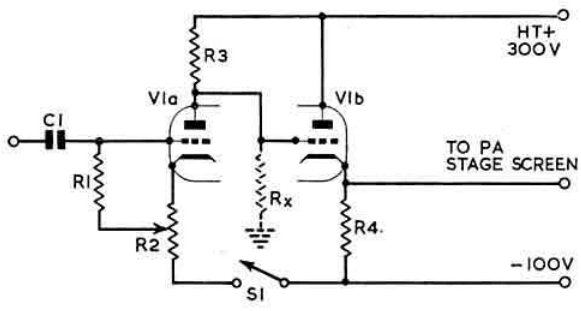

Fig. 1. Basic "series gate" modulation circuit. V1a is referred to as VA and V1b as VB in the text.

amplifier simultaneously and so produces carrier level control and audio modulation of the transmitter by variation of the screen voltage of the p.a. valve.

The modulator varies the positive potential applied to the p.a. screen in direct proportion to the amplitude of the applied audio voltage. To simplify the detailed explanation the modulator will first be considered in the d.c. state and then with the audio voltage applied.

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With the slider of R2 at the end connected to the cathode of VA, this valve operates without bias and a large voltage drop is developed across R3 thus reducing the anode potential of VA to approximately 10-15 volts positive relative to the chassis. This voltage is directly coupled to the grid of VB; as this valve is operating as a cathode follower the voltage appears at the cathode, hence the screen of the p.a. stage is 9-13·5 volts positive. This reduces the r.f. output from the transmitter to a very low level. If the slider of R2 is moved progressively away from the cathode towards its negative potential end a steadily increasing bias will be applied to the grid of VA and so the voltage drop across R3 will be reduced, until the anode of VA and the grid of VB are raised to approximately 250 volts positive. The screen of the p.a. stage will be raised to the same potential.

Under these conditions the p.a. stage will be operating at full output. The setting of R2 therefore makes it possible to adjust the output of the transmitter from a very low level up to almost full c.w. ratings. If VA is completely cut off by opening S1 the anode of VA and the grid of VB rise in potential towards the supply voltage, limited only by the flow of the grid current of VB through R3 and the p.a. screen potential is then the maximum obtainable with this circuit arrangement. The maximum potential can be set to any desired level by simply placing a further resistance RX from VB grid to chassis, so controlling the desired maximum p.a. screen potential. R3 and RX act as a potential divider across the supply voltage. This is the action of the modulator under d.c. conditions.

It can now be seen that by varying the bias on VA the screen potential can be easily varied. The same circuit will of course operate as a normal audio amplifier when the grid of VA is fed with an audio signal through C1.

Let us now consider the condition with both the audio and d.c. voltages applied. With the bias on the grid of VA set by R2 to approximately 1V negative the d.c. voltage applied to the screen of the p.a. is low and hence the r.f. output is also low. If an audio voltage of 1V peak is applied to the grid of VA, it will be amplified by VA and appear at the screen of the p.a. stage and so modulate the low r.f. output approximately 95 per cent, the mean d.c. potential of the p.a. screen remaining constant. If the audio voltage applied to VA is increased grid current will flow in VA and a negative charge will build up on C1 proportional to the peak amplitude of the applied audio waveform. This additional d.c. bias applied to the grid of VA will cause the potential on the anode of VA and the grid of VB (and hence the mean screen potential of the p.a.) to rise, resulting in increased r.f. output from the p.a. stage. Since the period of time for which this potential is raised depends upon the time it takes for C1 to discharge through R1, this time constant is most important and is considerably longer than the time duration of the lowest audio frequency used.

The increased audio voltage at the grid of VA will appear as an amplified voltage at the screen of the p.a. stage relative to its previous level, but as the mean screen potential has also been raised the carrier is again modulated approximately 95 per cent and no overmodulation occurs.

The bias on VA will vary until a limiting condition is reached where the bias built up on C1 cuts off VA and no further audio voltages can reach the screen of the p.a., the d.c. potential of which is at maximum; thus positive peak overmodulation is prevented. Negative peak overmodulation is prevented because the d.c. screen potential of the p.a. stage can never fall below the level selected by R2; the audio voltage can only just modulate this screen d.c. potential to produce 95 per cent modulation. Further increases in audio voltage result in the screen d.c. potential increasing.

It will be seen that not only can a high level of modulation be achieved but also a very simple and effective means of

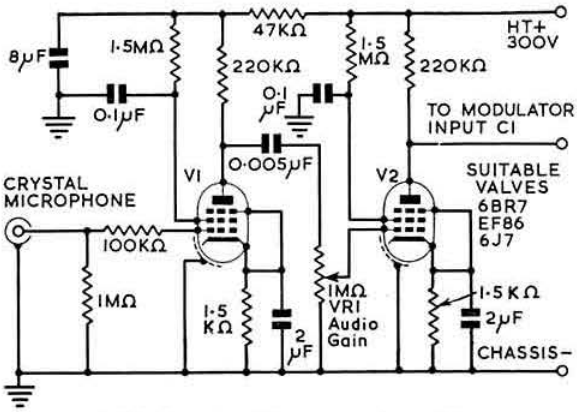


Fig. 2. Two valve high gain speech amplifier.

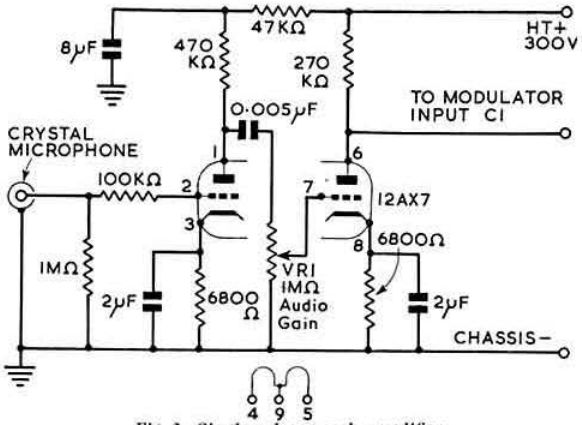


Fig. 3. Single valve speech amplifier.

speech clipping is obtained merely by increasing the audio voltage input above the level which will produce approximately 95 per cent modulation of the full output of the p.a. stage. Because no reactive components appear in the modulator after the clipping and because of the d.c. coupling between VA and VB no filter other than the r.f. decoupling components of the p.a. stage are necessary. The low output impedance of VB helps maintain good waveform and modulation linearity.

The time constant of C1-R1 is important and if made too long will increase the dissipation of the p.a. stage; if too short the signal exhibits a characteristic similar to fluttering and becomes difficult to read.

Practical Details

Various tests have been carried out both with test equipment and on the air to confirm the claims made for this system, and all have been substantiated. The circuit has been found very tolerant of valve types and no difficulty should be experienced with any of those listed.

The speech amplifier should not have wide frequency response characteristics and the low frequency roll-off should be approximately 6db per octave below 500 c/s. The best procedure is to limit the audio response essentially to 300-3000 c/s. This results in a reduction of the bass components in the audio waveform which are normally responsible for the peak values and a reduction of the high frequencies which help create a broad signal. The circuits in Figs. 2 and 3 will be found quite effective. It is possible to modulate a transmitter with simply a carbon microphone and associated transformer driving the modulator valve via C1.

Tests carried out with local stations while using heavy speech clipping confirm that the signal is clear and free from splatter.

Figs. 4 and 5 show the application of "series gate" modulation to two well-known transmitters while the circuit of a general purpose modulator is given in Fig. 6. With S1 set to "c.w." the stage acts as a normal clamp circuit and protects the p.a. under key-up conditions when an earlier stage is keyed.

The values of screen decoupling capacitors should be

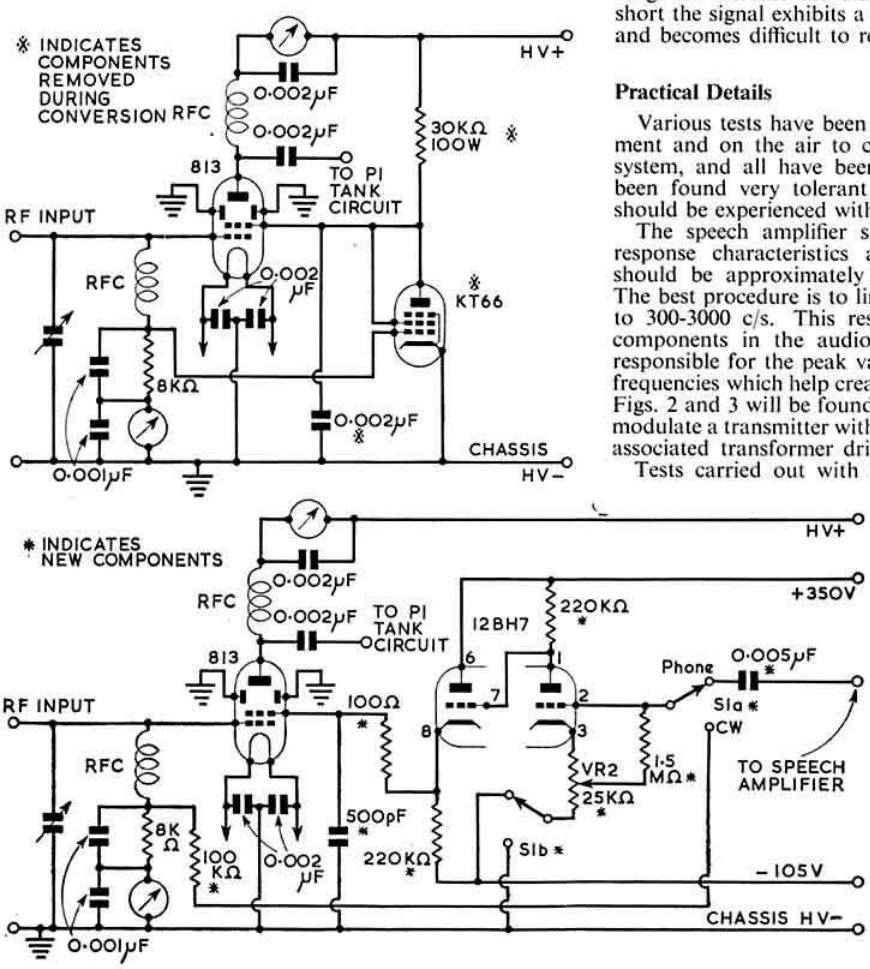


Fig. 4. Addition of a "series gate" modulator to a LG300 transmitter. The original p.a. circuit is shown in the upper diagram and the modified one below.

kept quite low—the maximum value is dependent upon the p.a. valve but 500pF is reasonable. The 60-100 ohm resistors should be included.

For mobile use the space and power economy are considerable and will result in a much reduced drain on primary power.

Setting Up

No difficulty should be experienced in getting the system to work but the best practice is to tune up the transmitter in the normal way with the modulator set to " c.w." After the tuning and loading adjustments have been made, switch to " PHONE " and set the residual carrier by VR2 to approximately one-fifth to one-eighth of the full carrier input for optimum results. Typical values are as follows:

Valve	Anode voltage	Ia residual	Ia peak
5763	300 volts	6 mA	40 mA
parallel 807s	600 volts	25 mA	200 mA

The setting of audio gain control VR1 is then gradually increased while speaking into the microphone until the anode current rises on peaks to the value obtained when tuning up in the c.w. condition. This is the normal setting but speech clipping can be introduced merely by advancing the audio gain control VR1 a little further; too much clipping will, however, reduce intelligibility rather than increase it. Once the settings of VR1 and VR2 have been set they remain stable over long periods. Preset controls could be used if desired. If very low levels of residual carrier are used it is sometimes difficult to tune the signal in initially under noisy conditions.

By reducing the audio gain control VR1 it is possible to

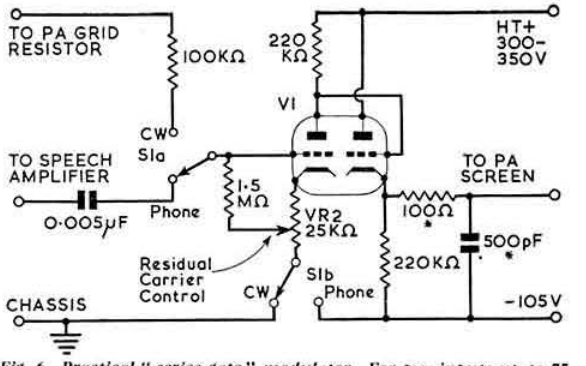
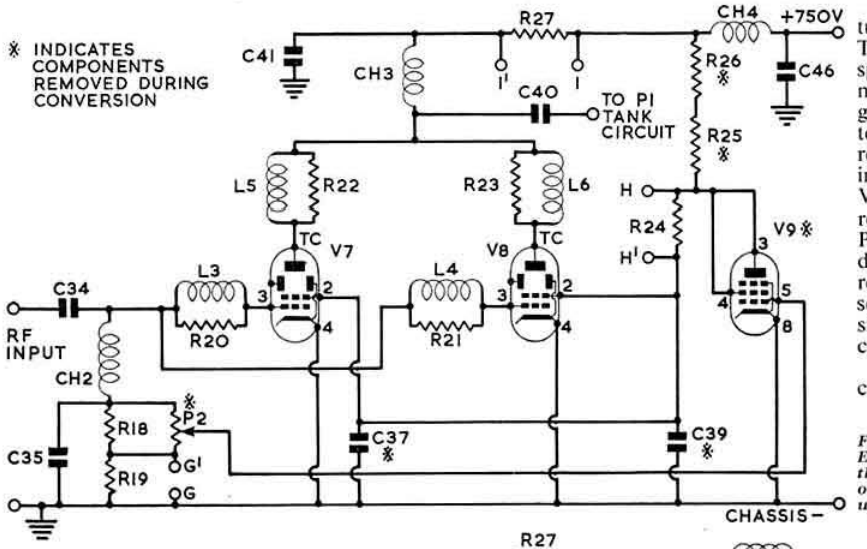


Fig. 6. Practical " series gate " modulator. For p.a. inputs up to 75 watts, suitable valves are the 6SN7 and 12AU7. For higher inputs, a 12BH7 may be used. Alternatively, two 6J5s or triode connected 6V6s are suggested. The 100 ohm resistor and 500 pF capacitor marked with asterisks are the normal screen decoupling components mounted close to the p.a. valveholder.



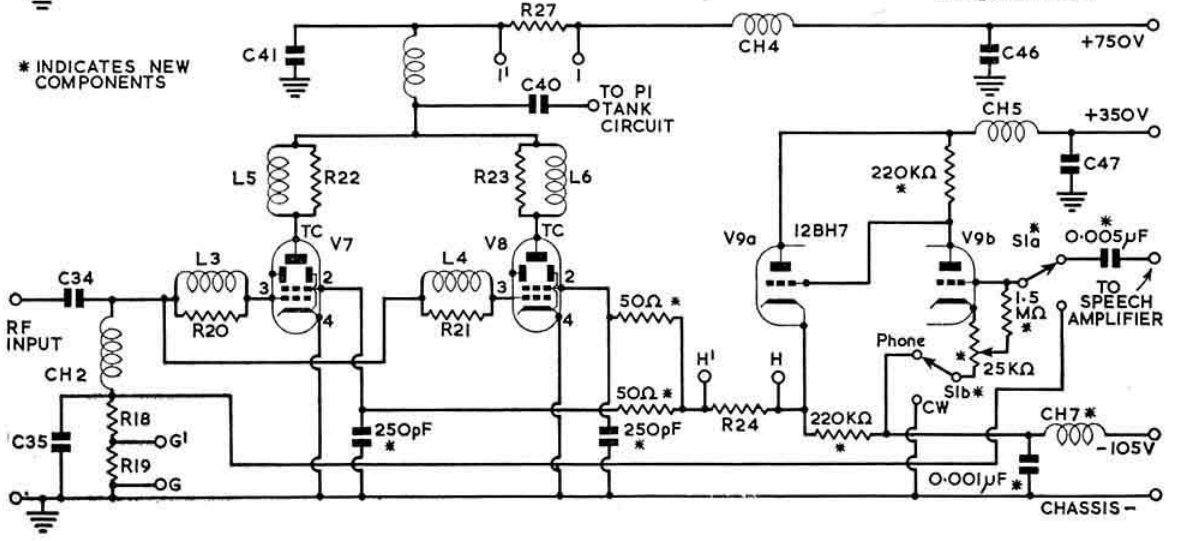


Fig. 5. " Series gate " modulator for the Elizabethan transmitter described in the R.S.G.B. Bulletin for July 1953. The original p.a. circuit is shown in the upper diagram and the modified arrangement below.

use VR2 for setting the output of the transmitter to any precise value for making s.w.r. measurements, etc.

The negative potential used can be derived either from a battery or from a well-smoothed power unit.

Further Ideas

Examination of the circuit will reveal that very little modification would be required to adapt it to perform as a valve keying unit; the keying characteristics could be easily shaped by a CR network at the grid of VA. The variation in mean d.c. potential at the cathode of VB could also be utilized for operating a voice-operated relay arrangement if desired.

It should be permissible to increase the anode potential of a p.a. stage considerably above the normal, possibly to 800 or 900 volts for an 807, without exceeding the rated dissipation.

No tests have been carried out on these ideas due to shortage of time but they are given here for the benefit of anyone who might like to try them.

Use with a Linear Amplifier

This method of modulation can be applied to a linear amplifier normally used for s.s.b. by inserting a small amount of carrier. Its use will result in effective amplitude modulation with the linear stage running much cooler than is the case if the balanced modulator is unbalanced and an amplitude modulated carrier applied to its grid.

Results

The system has been tested on all bands from 10 to 160m and with power inputs of 3 to 150 watts both for local and DX contacts with considerable success and without adverse comment. G3FZL has used the arrangement with a high power 2m transmitter with success. G3MYE has successfully applied the method to a W/S19 in place of the original grid modulation. The results have received the approval of all who have heard them.

Anyone wishing to hear this method of modulation should communicate with the writer and a suitable band and time can be arranged. It is best to switch off the a.v.c. when receiving a " series gate " modulated transmission.

Thanks are due to the many amateurs who have helped with the tests and in particular to G3BIA, G3FZL, G3LAK and G3NHR for their help and encouragement.

A fuller and mathematical analysis is available in *Electronics* dated November 1, 1957.

Transmitter Ratings

FROM time to time members ask Headquarters how power input to a certain type of amateur transmitter is to be measured. Everyone is familiar with the method for A1 and A3 transmitters (p.a. anode voltage multiplied by the anode current in amps. gives the input power in watts) but other systems, particularly single sideband and grounded grid amplifiers, present a somewhat different problem.

Single Sideband Transmitters

The Post Office states that:

" 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. 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 peaks of speech shall not be greater than twice the previously measured deflection for the tone input."

Frequency Modulation

The Post Office states that: " The carrier frequency [of an f.m. signal must be] at least 10 kc/s within the limits of the frequency band in use and that the maximum deviation of carrier frequency shall not exceed 2·5 kc/s. The maximum effective modulating frequency shall be limited to 4 kc/s, and the audio frequency input to the frequency modulator at any frequency above 4 kc/s shall be not less than 26db below the maximum input at lower frequencies."

Although the Post Office does not state the maximum effective modulating frequency for other types of phone operation, it is good practice to restrict the bandwidth to 4 kc/s or less (a frequency response of 500 to 2500 c/s is generally considered adequate for communication purposes).

Earthed or Grounded Grid Power Amplifiers

In the opinion of the Society's Technical Committee, the power input, effectively, to a grounded grid power amplifier stage should be reckoned as 10 per cent greater than the product of the anode voltage and anode current to that stage. One proviso is, however, that to prevent unreasonable driving power being used the power input to the driver stage should not exceed 50 per cent of the d.c. power input to the driven stage.

Pulse Modulation

The use of pulse modulation is permitted in the bands 2350-2400, 5700-5800 and 10,050-10,450 Mc/s, the systems specified being P1, P2d, P2e, P3d and P3e. These may be defined as follows:

P1 — Telegraphy without the use of a modulating audio frequency signal.

P2d—Amplitude modulation of the pulse by audio frequencies for telegraphy.

P2e—Width modulation of the pulse by audio frequencies for telegraphy.

P3d—Amplitude modulation of the pulse by audio frequencies for telephony.

P3e—Width modulation of the pulse by audio frequencies for telephony.

The maximum mean d.c. power input is 25 watts and 2·5 kW peak input power at the crest of the pulse. The limit of 2·5 kW peak d.c. input implies a maximum peak-to-mean ratio of 100 : 1, or a 1 per cent duty ratio.

The duty ratio is defined as the ratio between pulse duration and pulse repetition period. For example, if the pulse duration is t and the interval between the beginning of one pulse and the beginning of the next is T, then t/T is the duty ratio.

It is essential for a station employing pulse modulation to have a suitable cathode-ray oscilloscope in order to set up the transmitter. To display the envelope of the r.f. pulse, some of the r.f. output should be applied to the Y plates of the tube, the X plates being operated from the time base which should be locked at a sub-multiple of the repetition frequency.

Broadcast Receiving Licences

DURING March the number of combined television and sound licences throughout Great Britain and Northern Ireland increased by 102,495, bringing the total to 9,255,422. Sound only licences total 5,480,991 including 376,053 for sets fitted in cars.

A Wide-range Multi-band V.H.F. Converter

By A. H. KOSTER, Dr.Ing. (G3ECA)*

THE multi-channel television tuners which are readily obtainable on the market are admirably suitable for use as basic units for v.h.f. converters. The particular model referred to in the present article is the Kolster Brandes Adaptor, Type A, Part 441/1, which is available from radio and television dealers or from the K.B. Service Department at £6/6/-. Spare coil former assemblies for the aerial and oscillator sections are available at 4/6d. per pair from the same sources. The tuner is suitable for 6·3 volt parallel heaters and has an i.f. of about 19 Mc/s.

The arrangement to be described is intended for use by those who wish to tune over the very high frequencies with a view to becoming acquainted with what there is to be found and to becoming generally familiar with them. As it is unlikely that a multiplicity of aerials will be available to cover the v.h.f. spectrum the most likely approach will probably be to employ any convenient length of wire or an amateur Top Band aerial. This presupposes a circuit designed for general work. The design, therefore, is that of a wide-range converter which requires a minimum of work to be done to the original tuner.

The Circuit

Fig. 1 shows the circuit of the K.B. Type A adaptor Part 441/1 with the addition of a few components which can be recognized by alphabetical suffixes, i.e. Ca, Cb, Cc, Cd, Ra and VRb.

V1 is a d.c. cascode r.f. amplifier and VRb is the r.f. gain control. V2 is a combined triode oscillator and pentode frequency changer. In its original form the unit has a fine control of the oscillator frequency, a device that varies the dielectric of a condenser. It is very satisfactory when dealing with the wideband i.f. stages found in TV sets, but in conjunction with a communications receiver it is quite useless. The device should therefore be put out of action by unsoldering its connection to pin 1 of V2.

In order to make the oscillator tunable the capacitors Cb and Cc have been added. Ca is optional and will be referred to at a later stage. The tuner has a plate which covers the

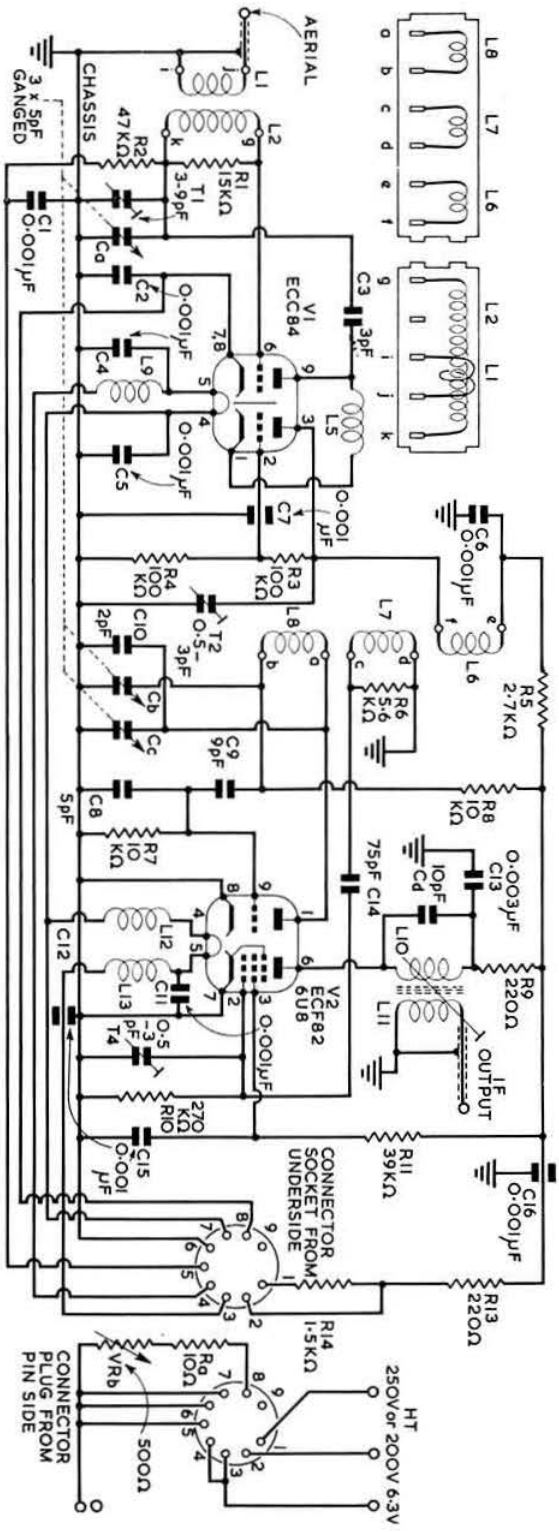


Fig. 1. Circuit diagram of the modified K.B. adaptor type A for use as a v.h.f. converter. New components are identified by suffix letters (see text).

C1, 2, 4, 5, 6, 11, 15, 0·001μF.
C3, 3pF.
C7, 12, 16, 0·001μF feedthrough.
C8, 5pF temp. coeff. pos. 100.
C9, 9pF neg. temp. coeff.
C10, 2pF.
C13, 0·003μF.
C14, 75pF.
Ca, Cb, Cc, three gang 5pF variable.
Cd, 10pF.
L1, 2, 6, 7, 8, see Table 1 and text.
L5, 9, 12, 13, 7 turns 26 s.w.g. enamelled on ¼ in. diameter polythene former ½ in. long.
L10, 11, i.f. output transformer (19 Mc/s) in TV tuner.
R1, 15K ohms 1/10 watt, 10 per cent.
R2, 47K ohms ½ watt, 20 per cent.
R3, 4, 100K ohms ½ watt, 10 per cent.
R5, 2·7K ohms 1 watt, 20 per cent.
R6, 5·6K ohms 1/10 watt, 10 per cent.
R7, 10K ohms ½ watt, 20 per cent.
R8, 10K ohms 1 watt, 10 per cent.
R9, 13, 220 ohms ½ watt, 20 per cent.
R10, 270K ohms ½ watt, 10 per cent.
R11, 39K ohms ½ watt 20 per cent.
R14, 1·5K ohms 2 watts, 20 per cent.
Ra, 100 ohms ½ watt, 20 per cent.
T1, 3-9pF ceramic trimmer.
T2, 4, 0·5-3pF ceramic trimmer.
V1, ECC84.
V2, ECF82 or 6U8.
VRb, 500 ohms variable.

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wiring to the valveholders. This plate can be removed and will not be required again. A three gang 5pF variable capacitor is mounted on the side of the tuner and fitted with a slow motion drive as shown in Fig. 2. The stators are connected with 16 s.w.g. wire to the terminals of the springy contacts corresponding to a, b and k.

The new tuning facilities thus provided enable the v.h.f. bands to be covered from 41 to 256 Mc/s in 19 ranges. The lowest frequency range spans 6 Mc/s., i.e. 41 to 47 Mc/s, and the highest 34 Mc/s., i.e. 222 to 256 Mc/s. The tuner provides for 12 channels and it would be possible to cover the spectrum with 12 sets of coils instead of 19 by increasing the

TABLE 1

Coil Winding Data for 16 Mc/s Intermediate Frequency

Range (Mc/s)	L1	L2	L6	L7	L8	Oscillator (Mc/s)	Remarks
222—256	3T, 22 s.w.g. interwound with L2	4T, 18 s.w.g. spaced 22 s.w.g.	2T, 18 s.w.g. ¼ in. long L6/L7 spacing as far as possible	2T, 18 s.w.g. ¼ in. long	3T, 18 s.w.g. ¼ in. long L7 close to L8	206—240	All coils self-supporting
205—234	3T, 22 s.w.g. interwound with L2	5T, 18 s.w.g. spaced 22 s.w.g.	3T, 18 s.w.g. ¼ in. long	3T, 18 s.w.g. ¼ in. long Coil spacing as above	4T, 18 s.w.g. ¼ in. long	189—218	All coils self-supporting
185—209	2T, 22 s.w.g. close wound on k-end of L2	6T, 22 s.w.g. ⅛ in. long	3T, 20 s.w.g. 7/16 in. long	2T, 26 s.w.g. closewound Coil spacing as above	4T, 20 s.w.g. ¼ in. long	169—193	Original Channel 10 coils with one turn removed from L8
169—189	2T, 22 s.w.g. close wound on k-end of L2	7T, 22 s.w.g. ¼ in. long	4T, 20 s.w.g. ¼ in. long	3T, 20 s.w.g. 7/16 in. long Coil spacing as above	5T, 20 s.w.g. 7/16 in. long	153—173	Original Channel 6 coils with one turn removed from L8
147—170	3T, 22 s.w.g. interwound with L2	7T, 22 s.w.g. spaced 22 s.w.g.	4T, 20 s.w.g. ¼ in. long L6/L7 spacing ¼ in.	4T, 20 s.w.g. ¼ in. long	6T, 20 s.w.g. ¼ in. long L7/L8 spacing ¼ in.	131—154	All coils self-supporting
136—150	3T, 22 s.w.g. interwound with L2	8T, 22 s.w.g. spaced 22 s.w.g.	5T, 22 s.w.g. ⅜ in. long	4T, 22 s.w.g. ⅜ in. long Coil spacing as above	7T, 20 s.w.g. ⅜ in. long	120—134	All coils self-supporting
125—138	3T, 24 s.w.g. interwound with L2	9T, 24 s.w.g. spaced 24 s.w.g.	5T, 24 s.w.g. ⅜ in. long	4T, 24 s.w.g. ⅜ in. long Coil spacing as above	8T, 22 s.w.g. 7/16 in. long	109—122	All coils self-supporting
116—127	4T, 24 s.w.g. interwound with L2	10T, 24 s.w.g. spaced 24 s.w.g.	6T, 24 s.w.g. ⅜ in. long	5T, 24 s.w.g. ⅜ in. long Coil spacing as above	9T, 24 s.w.g. 7/16 in. long	100—111	Wound on empty channel formers
108—118	4T, 24 s.w.g. interwound with L2	12T, 24 s.w.g. spaced 24 s.w.g.	7T, 24 s.w.g. ¼ in. long L6/L7 spacing ⅛ in.	6T, 24 s.w.g. ¼ in. long	11T, 24 s.w.g. close wound L7/L8 spacing ¼ in.	92—102	Wound on empty channel formers
98—108	4T, 24 s.w.g. interwound with L2	15T, 24 s.w.g. spaced 24 s.w.g.	8T, 25 s.w.g. ⅜ in. long	7T, 24 s.w.g. ⅜ in. long Coil spacing as above	12T, 24 s.w.g. close wound	82—92	Wound on empty channel formers
89—98	4T, 24 s.w.g. wound over k-end of L2	18T, 24 s.w.g. close wound	9T, 24 s.w.g. close wound	7T, 26 s.w.g. close wound Coil spacing as above	14T, 26 s.w.g. close wound	73—82	Wound on empty channel formers
81—90	4T, 26 s.w.g. wound over k-end of L2	22T, 24 s.w.g. close wound	10T, 26 s.w.g. close wound	8T, 26 s.w.g. close wound	11T, 24 s.w.g. close wound	97—106	Wound on empty channel formers
73—82	4T, 26 s.w.g. wound over k-end of L2	25T, 24 s.w.g. close wound	11T, 26 s.w.g. close wound L6/L7 spacing 1/16 in.	9T, 26 s.w.g. close wound	11T, 24 s.w.g. close wound L7/L8 spacing ⅜ in.	89—98	Wound on empty channel formers
66—74	4T, 28 s.w.g. wound over middle of L2	28T, 24 s.w.g. close wound	12T, 26 s.w.g. close wound	10T, 26 s.w.g. close wound Coil spacing as above	12T, 24 s.w.g. close wound	82—90	Wound on empty channel formers
61—69	4T, 30 s.w.g. wound over middle of L2	30T, 22 s.w.g. close wound	13T, 28 s.w.g. close wound	11T, 28 s.w.g. close wound Coil spacing as above	13T, 28 s.w.g. close wound	77—85	Original channel 5 coils
55—64	5T, 28 s.w.g. wound over middle of L2	35T, 22 s.w.g. close wound	14T, 28 s.w.g. close wound	12T, 28 s.w.g. close wound Coil spacing as above	14T, 28 s.w.g. close wound	71—80	Original channel 4 coils
51—59	5T, 28 s.w.g. wound over middle of L2	41T, 22 s.w.g. close wound	16T, 28 s.w.g. close wound	14T, 28 s.w.g. close wound Coil spacing as above	16T, 28 s.w.g. close wound	67—75	Original channel 3 coils
46—53	5T, 30 s.w.g. wound over middle of L2	37T, 26 s.w.g. close wound	18T, 28 s.w.g. close wound	16T, 28 s.w.g. close wound Coil spacing as above	17T, 28 s.w.g. close wound	62—69	Original channel 2 coils
41—47	6T, 30 s.w.g. wound over middle of L2	46T, 26 s.w.g. close wound	23T, 28 s.w.g. close wound	20T, 28 s.w.g. close wound Coil spacing as above	20T, 28 s.w.g. close wound	57—63	Original channel 1 coils

All coils are wound 7/32 in. inside diameter with enamelled copper wire.

condenser capacities from 5 to 7·5pF. However, tuning would be more difficult. The coil winding table gives the data for 19 coils and the desired ranges can be chosen and clipped in as required.

As previously stated the tuner has an i.f. of approximately 19 Mc/s. Since there are many receivers which do not tune higher than, say, 16 Mc/s the coil data (Table I) are designed for an i.f. of 16 Mc/s. The i.f. coil L10 has to be paralleled by Cd, a 10pF capacitor.

The capacitor Ca does not have a great effect unless an aerial is used that suits the particular range. It has been included in the circuit since it is a simple matter to provide

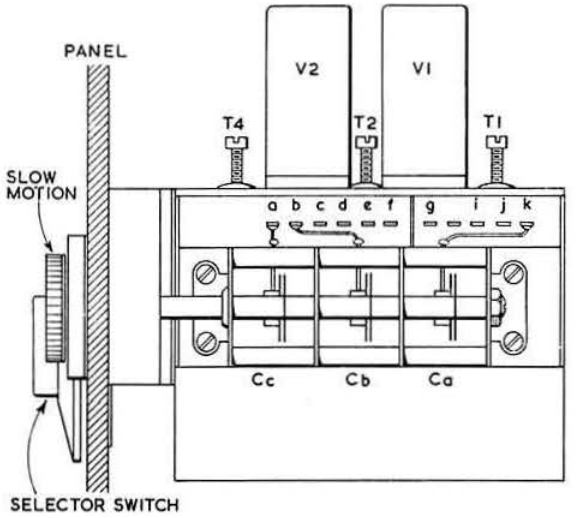


Fig. 2. Mounting of the tuning capacitor on the TV tuner.

for it. As to its utility, it is recommended that the performance should be checked with and without the connection from k to Ca. There is no point in trying to tune L6 or L7; attempts to do so frequently result in instability of the whole circuit.

The aerial is connected to the co-axial cable coming out of the top of the unit while the i.f. is taken out through the other length of co-axial cable from the side of the unit.

The power connector socket is a B9A base mounted on top of the unit adjacent to R14 which is also mounted on the top. A B9A plug with leads is supplied with the unit. Leads 3 and 4 should be connected to the live 6·3 volts heater supply. Leads 5, 6 and 7 should be connected to the common h.t. negative and neutral heater rail. The cathode lead 8 should be connected via Ra and VRb to 5, 6 and 7. Provision is made in the unit to apply either 250 volts h.t. to lead 1 or 200 volts to lead 2. This completes the power supply connections.

Adjustment

The i.f. coil is adjusted by connecting the output to a communications receiver and moving the core for maximum noise output at 16 Mc/s. The converter should of course be switched on for this operation.

It is essential that the oscillator should cover the desired range. Although the data given in Table I are as accurate as can be expected it is impossible to be certain without a check by means of a frequency meter or grid dip oscillator. This applies particularly to the higher ranges where the coil turns may have to be compressed or expanded to cover a desired range. Some experimenting with the wire gauges or number of turns may also be necessary.

The bandwidth of the converter is such that some signals are bound to be heard and by altering the turns spacing of L6 and L7 they can be peaked up. Again a signal generator or grid dip oscillator is a great help. The input circuit is aligned by means of the trimmer T1. If particular interest exists in a special band this can be peaked up on all three coils by means of the trimmers T1, T2 and T4.

It will be seen from the coil table that some of the original TV channel coils are used. In these cases the oscillator ranges can be adjusted by means of the brass cores already provided. Nothing has to be done to the other coils of these channels because their centre frequencies have been adjusted by the manufacturers.

Oscillator Stability

The oscillator stability of the original adaptor is designed to satisfy television requirements. Capacitors C8 and C9 are by design temperature sensitive in order to compensate for temperature changes but the oscillator drift in the warming-up period of 20 minutes is of the order of 100 kc/s. In order to cope with this drift capacitors of different temperature coefficient can be tried. Alternatively it is an easy matter to follow the drift with the ganged tuning capacities Ca, b, c or by tuning the main receiver around the i.f. of 16 Mc/s.

Results

Using a Top Band aerial, signals on the 4m and 2m amateur bands can be heard as well as the TV and f.m. stations in various parts of the country and many other services. Undoubtedly some skill is required to tune in weak signals on the higher bands because the range covered by the sweep of the tuning condensers is very wide. Rigidity in the mounting of the tuning dial is essential. Operating the companion receiver in its widest selectivity position helps a great deal.

New British Standard

The relation between the sone scale of loudness and the phon scale of loudness level

IN this new publication the sone scale is specified by its relation to the phon scale, the relation used being an approximation based on assessments of the available experimental evidence, although it does not necessarily represent the degree of accuracy required for research purposes.

The Foreword to the standard explains " The loudness level of any sound may be expressed uniquely in accordance with the procedure defining the phon scale (B.S. 661, " Glossary of acoustical terms "). Owing, however, to the arbitrary nature of the phon scale, loudness values expressed in phons have to be interpreted by the user on the basis of previously heard sounds of known loudness level.

" For some purposes, especially to convey to the non-specialist the relative loudness of different sounds, it is preferable to express loudness values in the units of an alternative scale. This scale, in which the loudness is expressed in sones, is so constructed that the apparent ratio of the loudness of two sounds as judged by normal observers, is given directly by the ratio of the sone values of the sounds."

Copies of the new Standard may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1, price 3s. plus postage.

V.H.F. ACTIVITY NIGHTS

MONDAYS FROM 8 TO 10 ON TWO
WEDNESDAYS FROM 8 TO 10 ON FOUR

See how many stations you can work, and report the results to G2AIW (V.H.F. Editor).

Transistors for Transmitting

By R. E. WOLPERS (G3LCB)*

IF a transmitter is to be portable it should be economical in power consumption and contain its own power supply. Valves require high and low voltage supplies and whilst provision of the latter is perfectly straightforward the high voltage presents more of a problem. Using a dry cell battery or a converter involves extra weight, bulk and expense, while the power used for the valve heaters does not contribute directly to the transmitter output.

The use of transistors overcomes these disadvantages because only a low voltage supply is needed. Although the power handling capacity of types easily obtainable, at the time of writing, is only small this need not be regarded as a serious drawback. Reference to the Low Power Contest results will show what can be done with inputs in the order of 500 mW.

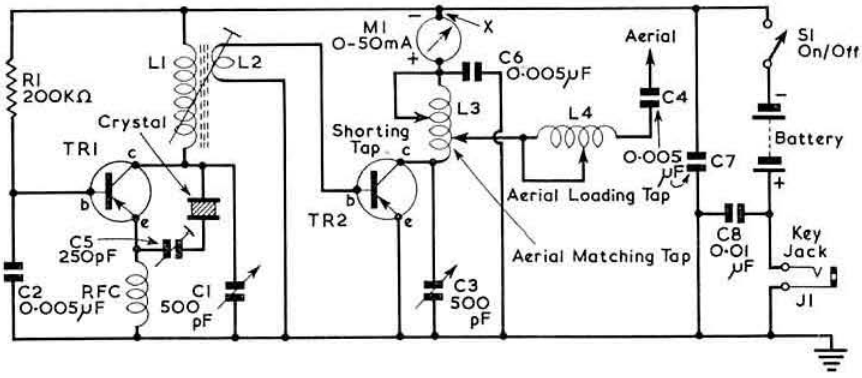


Fig. 1. Transistor crystal oscillator and amplifier.
L1, 45 turns 24 s.w.g. enamelled close wound on a ½ in. diameter dust cored former; L2, 5 turns wound over the earthy end of L1; L3, 60 turns 18 s.w.g. enamelled close wound on a 1¼ in. diameter former and tapped every 5 turns; L4, 28 turns 18 s.w.g. BTC wire open wound on a 2 in. diameter former tapped as required for aerial used. Details of the transistors and other components are given in the text.

Circuits

The circuit shown in Fig. 1 consists of a crystal controlled oscillator for the 160m band (similar to that described by G3KOX in the October 1957 issue of the BULLETIN) followed by a common emitter amplifier. Output from the oscillator is taken by the link winding L2 and connected to TR2 between base and emitter. The alternating voltage applied across this junction will, on alternate half cycles when the base is negative with respect to the emitter, allow current to flow in the collector circuit. The amplifier tank circuit (L3-C3) follows normal practice but it is essential to construct L3 with several taps in order to permit adjustments for optimum L/C ratio and aerial matching to be made.

Tuning

Effects of tuning are best observed on an r.f. indicator placed near the transmitting aerial. With L2 at minimum coupling adjust C5 so that the circuit oscillates when C1 is tuned through resonance, the final setting of C1 being as for any crystal oscillator. When oscillation commences meter M1 will indicate TR2 collector current which will rise as L2 coupling is increased. Careful adjustment of coupling is necessary to obtain optimum performance but once set up L2 may be fixed. When C3 is tuned through resonance a reading should be obtained on the output indicator. The shorting tap on L3 is adjusted, in conjunction with C3, to give maximum output followed by adjustment of the aerial matching and loading taps. This procedure should be repeated until maximum output is indicated or until maximum transistor input rating is reached. During tuning the signal should be monitored to check for spurious oscillations. They can be prevented by suitable adjustment of the tuning controls. Using this circuit amplifier inputs of nearly 100 mW, with a 6 volt supply, and 250 mW, with 12 volts, are possible. The aerial length used by the writer was 72 ft.

Modulation

Several methods have been tried, best results being obtained with the circuit shown in Fig. 2 using choke coupled modulation of the TR2 collector supply. The modulator is a single stage class A amplifier and for convenience a carbon microphone is used. Whilst almost any a.f. choke can be employed it should preferably have low resistance, a section of the tapped primary winding of a loudspeaker output transformer being suitable. Input to TR2 will be reduced to about 40 mW using 6 volts or 150 mW with 12 volts.

Despite the low power when using the modulator numerous local contacts have been made with reports of S7 and better; an S4 report was received from a station 10 miles away.

V.F.O. Control

Low power crystal controlled operation may suffer badly from interference but with a v.f.o. much of this can be avoided and a suitable circuit is shown in Fig. 3.

The v.f.o. has less output than the crystal oscillator and

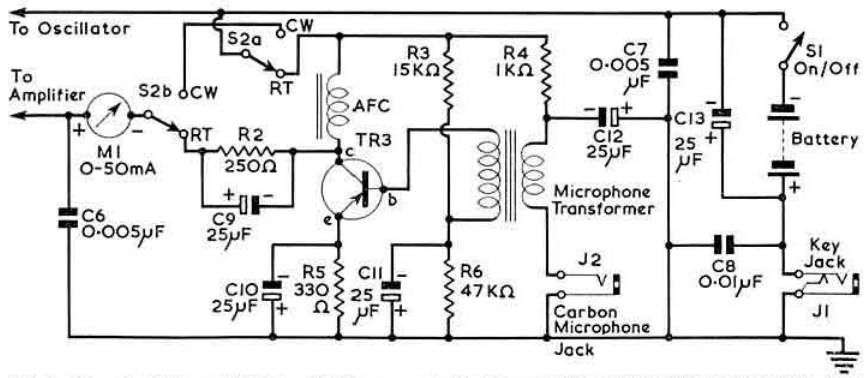


Fig. 2. Circuit of the modulator which is connected to the amplifier at the point marked X in Fig. 1.

* *19 Cedar Avenue, Sidcup, Kent.*

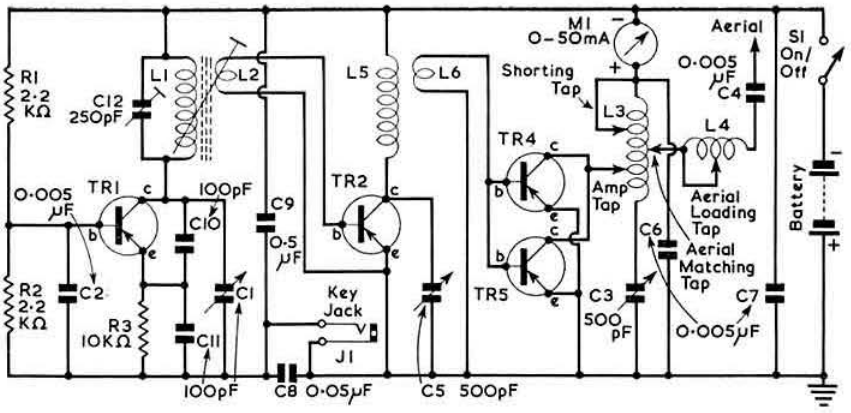


Fig. 3. Transmitter comprising v.f.o., buffer and amplifier. L1, 2, 3, 4, see caption to Fig. 1; L5, 50 turns 24 s.w.g. enamelled close wound on a 1 in. diameter former; L6, 6 turns 24 s.w.g. enamelled wound over the earthy end of L5.

will not drive the amplifier so an intermediate stage is necessary. This amplifier will, however, give sufficient output to drive two transistors connected in parallel as the final amplifier. Tuning and coupling procedure follows that used for the crystal controlled circuit. Care is needed to obtain maximum output yet retain good oscillator stability. It is also necessary to tap the final amplifier collector down the tank coil in order to ensure optimum performance. Input to the final stage with a 6-volt supply is 120 mW and 350 mW using 12 volts. This circuit gives satisfactory results on c.w. but has not been tried on telephony.

General Remarks

The transistors used in these circuits are available as surplus types, identified by coloured spots, red-yellow for r.f. use and yellow-green for a.f.* Those intended for r.f. use are rated at 20 mW collector dissipation with a 5-volt supply and a collector current of 10 mA but in an endeavour to obtain maximum output these ratings have been exceeded. This should not be regarded as good practice and it would be preferable to use transistors with higher ratings. *If the ratings are exceeded there is great risk of serious damage to the transistors.* Those used in the amplifier stages could be protected by any of the usual methods but the output will be reduced. If spurious oscillations are troublesome then neutralisation of the amplifier could be tried as a cure.

A suitable method of construction for a transmitter of this type has not yet been worked out but for experimental purposes a Paxolin board fitted with small tag strips conveniently placed will be useful.

* Members should note that as the transistors are types available on the surplus market, some of the values of resistors quoted in the circuit diagrams, and some of the currents mentioned in the text, may well not apply to the transistors which they obtain. A little experimentation may therefore be necessary.

Ham Tips

● Plastic knitting needle gauges, sold in multiple stores for a few coppers, are very useful for checking the gauge of wire (s.w.g.).

● Knobs may be fitted to the short spindle screw-driver adjustment type of variable condenser by sweating a length of ¼ in. diameter copper tube on to the spindle.

● Thin aluminium foil, such as the "silver paper" in cigarette packets, is ideal for screening small holes in chassis. For fixing use polystyrene cement as sold for aero modelling. Check for continuity with a test meter after the foil is in position.—G3ABG.

Soldering Iron Rest

CONSTRUCTION of an easily made soldering iron rest, with provision for full- or half-heat on standby, is shown in Fig. 1. It should be noted that the hinge is not central: this allows the iron to be on full-heat whenever it is lifted from the stand for use.—G2BSA.

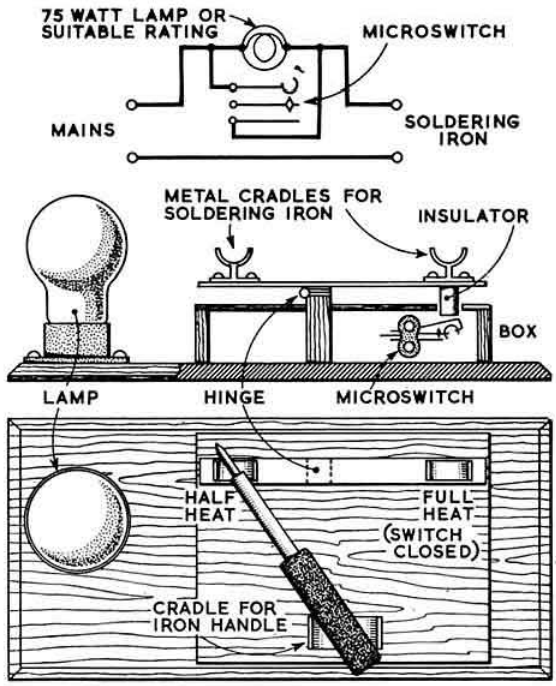


Fig. 1. Soldering iron rest for full- or half-heat.

Isotopes Power Amateur Radio Equipment

WHAT was described as America's first "isotope-powered radio station," operated by an improved model of a nuclear conversion generator, was exhibited at the Fifth Nuclear Congress in Cleveland, Ohio, in April. The generator is similar to the SNAP-III radioisotope-powered generator demonstrated in Washington earlier this year. At the Cleveland Congress it was used to run an Amateur Radio transmitter and receiver. It was fuelled by about one-third of a gram of polonium-210.

THE MINIMITTER MOBILE AERIAL

REVIEWED BY
R. F. STEVENS
(G2BVN)

THE Minimitter loaded whip aerial for mobile use, first shown at the R.S.G.B. Radio Hobbies Exhibition in November 1958, consists of a spring base with a bottom section of 1 in. diameter dural tube on which can be mounted interchangeable top sections for 1·8, 3·5 and 7 Mc/s. The base requires a ⅞ in. diameter fixing hole in the vehicle body, the same diameter as that required for a standard Lucas reversing light, a point which may be useful when the vehicle is to be sold. The split aluminium casting (Fig. 1) can be locked so that the sections are in line or at any position up to a right angle. When mounting the aerial in some positions on a modern car, e.g. the tops of the rear wings, it may be desirable to give additional strengthening by using a small plate of ⅛ in. steel which can be clamped on to the inside of the body by the base section fixing nut.

The base spring is strong, but resilient, and will not take a "set." The length of the bottom section should be such that the loading coil is not below the level of the vehicle roof and therefore is supplied to individual requirements.

The manufacturer states that the loading coils, which are weatherproofed with silicone varnish, are designed to have medium "Q," so that operation is possible over a limited frequency range without retuning because in practice it is found that mobile operation is usually confined to around one spot in any area, with only small changes to avoid interference. The aerial is resonated by means of the capacity hat, the spokes of which are made of spring to avoid breakage on impact with the branches of trees. The position of the hat will vary with each vehicle, and in the first instance its optimum position can best be determined with the aid of a field-strength meter. Correct adjustment will greatly increase the strength of received signals.

The appearance of the aerial is neat and it does not look out of place on a modern car. When the equipment is not in use the top section (including the coil) can easily be removed leaving only the unobtrusive bottom section and spring base. The aerial is robustly made and even at high speeds will not be a danger to other road users or pedestrians. The equipment is complete with mounting and feed-through washers and is designed to be fed with 52 ohm cable.

Results on Top Band have been very satisfactory. During daylight, consistent mobile to mobile communication up to distances of 35 to 40 miles has been maintained, while after dark contacts with fixed stations up to 250 miles away have been made.

The aerial is manufactured by the Minimitter Co. Ltd., 37 Dollis Hill Avenue, London, N.W.2.

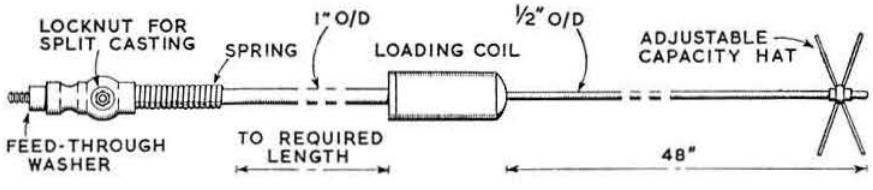


Fig. 1. Identification of the various parts of the Minimitter mobile aerial.

Maritime Mobile in Region II

EFFECTIVE January 30, 1959, United States amateurs now have additional maritime-mobile facilities. Amateur stations aboard ships may use any authorized amateur band from 7 Mc/s up to 148 Mc/s when on the high seas in Region II (North and South America). When they operate from international waters in Regions I and III, however, American maritime-mobiles can use only the 21 and 28 Mc/s bands as heretofore. Amateur stations on shipboard in domestic waters may use any amateur band. Identical privileges are available for aeronautical mobile stations but in both cases the permission of the Master of the ship or Captain of the aircraft is required. The installation must be separate from any radio equipment normally on board, and it must not cause interference to such equipment. The amateur station wiring must conform with safety regulations.

Military Valve Types

INFORMATION on valves with military type numbers (in series beginning CV, VT, etc.) may be obtained by sending a stamped addressed envelope to B. M. Johnson (G3LOX), 4 Orchard Drive, Chorley Wood, Herts.

The Twenty-second B.E.R.U. Contest, 1959

VE7KX wins High Power Section—ZS6R again winner of Low Power

"ANOTHER B.E.R.U. gone—the next awaited in pleasurable anticipation" sums up the feelings expressed by competitors in this unique contest—unique because it is not just another DX contest but an annual meeting ground of old friends—of fleeting QSOs with stations regularly contacted during the event but whose call-signs may not be heard again until "next time," and one in which the occasional absence of a regular is noticed with regret.

Although there were four fewer entries in the Low Power section than last year, the numbers for the other sections were identical, and if it had not been for an unfortunate error in an Australian publication, where the dates were incorrectly given, it is probable that activity there might have been higher and the number of entries above last year's high figure.

The Leading Stations

For the second time in three years a Canadian has won the High Power section—this time it is J. T. Hepburn (VE7KX) of Richmond, B.C. His score of 4,948 points was achieved by making 463 scoring contacts of which no fewer than 132 counted for bonus points—this despite the appalling QRM from the A.R.R.L. C.D. contest that was in full swing "over the border." Our old friend George Barrett (ZC4IP) is again second, with 4,157 points from 564 contacts, whilst Don McVicar (VE2WW) moved up to third place. ZD2GUP was fourth and the leading home station, G5DQ was placed fifth, a few points ahead of G5RI.

Once again the Low Power section has fallen to J. C. van Wyk (ZS6R) of Germiston, his score of 2,816 from 284 scoring contacts being a good advance on last year's figures. D. C. Piccirillo (ZD2DCP) with 1,807 was again second, whilst P. N. Pitt (ZC4PN), although on duty for 12 hours of the contest, amassed 1,729 points to take third place.

The receiving section was won by F. Johnstone (G3IDC/4S7) with 3,459 points, which may provide some consolation for his being unable to participate in the transmitting sections owing to the ban in force in Ceylon at the time. His score was 674 higher than that of W. E. Wilkinson (B.R.S.20317) who was second.

Equipment and Conditions

Whilst there appeared to be no great change in the equipment used, more stations seemed to be equipped with commercially-built transmitters, whilst the number of home-built receivers was also greater than in previous years. These were generally double or triple conversion superhets incorporating crystal gates or other devices to increase selectivity. Even those using commercial receivers had generally modified them to some extent, but G3JZK has been really ambitious. He has an "Eddystone S740, preceded by grounded grid r.f. stages and overtone c.o. and mixer with a cathode follower output at 3·5 Mc/s, the S740 providing a 450 kc/s output which feeds into a panadaptor and an extended i.f. strip with crystal lattice filters, synchronous detector with twin product detectors, I and Q audio channels with sum and difference circuits giving independent upper and lower sideband outputs to each earphone, or either sideband to both phones."

Conditions were rather variable and generally considered to be less good than last year. 14 Mc/s was the main band, but both 21 and 28 Mc/s came into their own during the daylight hours. Most competitors made frequent changes of band to reap the full benefit from all.

The summer conditions in Australia are not conducive to a high rate of scoring, but VK5NO, realizing only on the second day that the contest was in progress, made 119 contacts, showing that it is by no means impossible for a well operated and efficient station in Australasia to come high in the placings. Malaya is another part of the Commonwealth for which January is a bad month for radio, and is in fact the worst that could be chosen for a contest, but VS1HX by a fine effort in the Junior section, in which he was fourth, attained the highest position so far gained by a competitor from that country.

Comments

The highlight of the comments was made by VE2YU,

HOW THE LEADERS MADE THEIR SCORES

Call-sign	Bonus Contacts per Band (3·5—7—14—21—28 = Total)	Transmitter(s)	Receiver	Aerials
VE7KX	8—19—58—34—13 = 132	4CX1000A Final (750W)	NC300	3·5 Mc/s full wave centre-fed. 7 Mc/s four element colinear, 14, 21, 28 Mc/s rhombics and 426 ft. long wire.
ZC4IP	3— 8—21—22—13 = 68	Command types (3·5, 7, 14) Similar home-built (21 and 28) Final two 1625 in parallel (150W)	HRO(modified), home-built crystal converter for 28 Mc/s.	137 ft. end fed; 14 and 21 Mc/s dipoles; rotary cubical quad for 28 Mc/s.
VE2WW	5— 9—33—19—13 = 79	KWS—1; KWM1 (4-250 final)	Racal	Vertical ⅜ wave on 3·5 Mc/s; also used on 7 Mc/s; 14 Mc/s 3-element rotary; 21 Mc/s 3-element rotary; 28 Mc/s 4-element rotary.
G5DQ	5—12—30—28—24 = 99	LG300 (150W)	AR88	3·5 Mc/s ¼-wave vertical; 7 and 14 Mc/s ½-wave dipoles; 21 Mc/s 3 half waves centre fed; 28 Mc/s ground plane.
G5RI	5—12—33—28—21 = 99	LG300 (150W)	HRO (modified) c.c. converters on 21 and 28 Mc/s	Rhombic and "Vee" beams, all bands; full wave Zepp, 3·5 Mc/s.
ZS6R	3—13—22—20—12 = 70	V.f.o.—Doubler—807 (24W)	RF24—NC200—BC453	Folded dipoles (7, 14, 21 and 28 Mc/s); 7 Mc/s aerial Marconi tuned for 3·5 Mc/s.
ZD2DCP	1—8—14—13— 9 = 45	V.f.o.—Doubler—807 (25W)	HRO	Folded dipoles, 7, 14, 21 and 28 Mc/s, and an all band centre fed.
ZC4PN	4—11—14— 6 = 35	Geloso v.f.o.—807 p.a. (25W)	SP200S	7, 14, 21 Mc/s dipoles, 28 Mc/s 2 element rotary beam.

VE2WW with the station mascot on top of the Racal receiver. Other equipment includes Collins KWS-1 and KWM1 transmitters.

who said that after hearing a W call " CQ BERU," was surprised to hear a station come back to him. The reply, short and to the point, was simply " Remember 1776! "

Many made mention of the high standard of operating in B.E.R.U., and the enjoyment it provides. VO1DX says " the most longed-for event . . . like the good fellowship and the sense of Commonwealth unity which this contest always achieves," while VE4MJ sums it up in " I have been in several VE/A.R.R.L. DX contests but have never heard such gentlemenly behaviour before." 9G1BQ comments, " The best of all contests in any part of the world. The operating was very good indeed . . . An American friend said he had not heard such beautiful operating from so many amateurs in any other contest."

A number of suggestions have been made regarding the date, duration and scoring system, some of which have already been tried and rejected. For instance ZD2DCP asks for any 36 hours of the 48 to count, but in 1953 when any 24 out of 36 hours was permitted, it aroused the strongest criticism, and the majority of those who commented were in favour of fixed periods. ZS6R suggests reverting to the old method of spreading the 48 hours over two weekends, but the change to one period was only made as a result of criticism; when the single 48 hour period was introduced in 1954 it was the subject of much favourable comment. The sliding scale scoring system is another matter that finds favour with some, but when it was in use it was called " too complicated," a point which was readily agreed by the Contests Committee when it came to checking! In fact, even with the simple system used now, five out of the first six logs had inaccuracies in their claimed scores.

HIGH POWER SECTION

Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts
1	*VE7KX	4948	463	31	G3GKI	1555	111	61	G3APN	873	64	90	G8KU	447	22
2	*ZC4IP	4157	564	32	GM3EOJ	1550	114	62	VE4SX	846	78	91	G6PR	443	29
3	*VE2WW	3702	431	33	*VK2GW	1549	118	63	VE3BGG	839	104	92	VK2PV	435	25
4	*ZD2GUP	3426	486	34	VQ6LQ	1490	149	64	VE4MJ	826	95	93	VE2OL	410	50
5	*G5DQ	3100	225	35	ZC4GF	1470	162	65	VE3DDU	815	99	94	VS6DS	409	58
6	*G5RI	3078	225	36	VK5NO	1384	119	66	G3KSH	805	44	95	G5IV	393	23
7	*VE3UOT	3081	341	37	VE7MD	1359	126	67	VE2ATU	789	70	96	VE6VO	390	30
8	VE2YU	2914	331	38	G5TO	1358	84	68	VE3EAM	778	78	97	GM3IAA	385	21
9	*G5WP	2798	200	39	VQ4KPB	1343	93	69	GM3FJP	701	44	98	VS6EH	380	36
10	G2DC	2559	189	40	G5ZK	1289	82	‡	G2FYT	685	41	99	VE1DB	378	32
11	*VQ3HD	2461	234	41	G3AGN	1283	73	70	ZC4CB	672	68	100	VE1EP	365	18
12	G3FXB	2399	180	42	VK2APK	1239	84	71	G3NBE	670	49	101	VK4XW	360	20
13	*VO1DX	2259	289		G2BB	1239	74	72	VK5JT	658	48		G3GXO	360	24
14	*MP4BBE	2247	238	44	G6GN	1197	72	73	ZK1AK	655	59	103	VE5QC	359	22
15	VE2AYY	2157	237	45	G3GGS	1183	77	74	G8DI	648	34	104	VE4MF	353	24
16	G3KKP	2130	150	46	G3KAD	1180	84	75	VK3HL	629	46	105	G3BSR	345	17
17	G2QT	2099	146	47	G3HZL	1178	72	76	G3VA	625	33	106	VE3RN	340	32
18	G8KP	2064	145	48	G3FPK	1170	68	77	ZS6BJ	624	49	107	G3CNB	328	26
19	VE3BMB	2002	190	49	G5VU	1128	74	78	G2AJB	617	37	108	G2ZR	300	24
†	VE3BWY	1940	213	50	ZL4BO	1119	100	79	VK2OW	598	36	109	G3JKY	295	15
20	G3GFG	1889	130	51	VE2BK	1025	142	80	G5RV	589	31	110	G6PJ	284	17
21	G5RP	1884	124	52	VE6SZ	998	92	81	G3EUE	570	46	111	VE1QN	275	39
22	*VE1IM	1848	242	53	G3ASG	945	59	82	ZD7SA	566	50	112	G6GH	250	14
23	G3JZK	1838	125	54	GM3EDU	934	43	83	VE3ADV	555	27	‡	G2XG	240	16
24	VE1EK	1831	247	55	G3AAE	926	50	84	G2FQG	538	32	113	VE2RL	230	14
25	G3BKF	1827	118	56	G5JU	925	54	85	G2BLA	500	25	114	ZS1O	220	12
26	*ZL1HY	1690	160	57	VQ2W	907	91	86	VS6BJ	485	25	115	G3KLQ	204	9
27	G3LET	1660	85	58	VE2PZ	903	113	87	VE6HG	482	49	116	G3GYD	180	8
28	VE2WA	1658	160	59	G3VW	886	47	88	G2AOL	475	19	117	G3MWZ	160	8
29	ZL1RD	1565	125	60	VE2DR	875	104	89	G3WP	454	31	118	VE3DMU	155	7
30	G2HPF	1556	100												

LOW POWER SECTION

Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts	Posn.	Call-sign	Pts.	Contacts
1	*ZS6R	2816	284	7	G2DU	1428	94	12	ZE3JO	989	100	17	GI3GPE	863	57
2	*ZD2DCP	1807	182	8	*ZE5JE	1415	144	13	*ZB1CR	952	111	18	G3LTH	790	50
3	*ZC4PN	1729	210	9	ZE6JE	1267	74	14	ZB1AQ	924	141	19	*ZL1MT	765	41
4	*VS1HX	1635	110	10	*VO2NA	1237	156	15	*ZL3US	893	60	20	VQ3SS	608	50
5	*GW3AHN	1524	117	11	ZC4IK	1033	127	16	G3GNS	885	55	21	GM4GK	215	15
6	*9G1BQ	1429	151												

RECEIVING SECTION

Placing	Call-sign	Points	Placing	Call-sign	Points
1	*G3IDC/4S7	3459	6	G3GOX	1821
2	*B.R.S. 20317	2785	7	B.R.S. 2292	1793
3	B.R.S. 19107	2738	8	G2CIL	1484
4	B.R.S. 6604	2368	9	B.E.R.S. 957	1317
5	B.R.S. 21624	1940	10	B.R.S. 19771	1204
			11	W.I.A.—L2022	158

* *Certificate Winners.* † *Invalid—Rule 4.* ‡ *Invalid—Rules 5 and 10.*

DX CONDITIONS FROM GREAT BRITAIN
(Based on a cross-section of B.E.R.U. Logs)

JANUARY 17, 1959

00.01	(3·5) VO; (7) VO, VQ3, ZC4; (14) VE1, 2, 3, 6, 7, ZC4, ZD2.
01.00	(7) VE1, 2, 3, VO, VQ3, 6, ZC4, ZD2; (14) VE1, 2, 3, 4, 6, 7, VO, VP6, VQ3, 4, ZC4, ZD2, 9GI.
02.00	(7) VE1, 2, 3, VQ6, ZC4, ZD2; (14) VE1, 2, 3, 6, 7, VO, VP8, VQ3, 4, ZD2.
03.00	(3·5) VE2, ZC4; (7) MP4, VE1, 2, 3, ZC4, ZD2; (14) VE3, 4, 6, 7, VQ3, 6, ZC4, ZD2.
04.00	(3·5) ZC4; (7) ZD2; (14) VE1, 2, 3, 6; VO, VP9, ZC4, ZD2, 9GI.
05.00	(7) VE1; (14) MP4, VE1, 2, 3, 4, 5, 6, 7, 8, VO, VQ3, ZC4, ZD2, ZS6, 9GI.
06.00	(7) VE3, ZC4; (14) VE2, 5, 6, 8, VO, ZC4, ZD2, ZL4, ZS6; (21) MP4.
07.00	(3·5) VE3; (7) VE2, 3; (14) VE2, 3, 6, 7, 8, VK2, ZC4, ZD2, ZK1, ZL1, 3, 4; (21) MP4, VQ3, 4, 6, ZC4, ZD2, ZL1, 3.
08.00	(7) VE2; (14) VE2, 3, 5, 6, 7, 8, VK3, 5, ZC4, ZK1, ZL1, 2, 3, 4; (21) MP4, VQ3, ZB1, ZC4, ZD2, ZL1; (28) ZD2.
09.00	(14) VE2, 3, 6, VK2, 3, 5, 7, ZL1; (21) VK9, VQ6, VS1, ZC4, ZD2, ZL1, 2, 3, 4; (28) MP4, ZC4, ZD2, ZE, ZS6.
10.00	(14) VE2, 3, VO; (21) VK2, 9, VQ6, ZB1, ZC4, ZD2, ZL1, 3, 4, 9K2; (28) MP4, VQ3, 6, VS6, ZC4, ZD2, ZE, ZS6.
11.00	(14) VE2, 3, VO; (21) VE1, 2, 3, VK2, VO, VS6, ZB1, ZC4, ZL1, 3, 4; (28) MP4, VQ3, 6, VS6, ZD2, ZE, ZS6.
12.00	(14) VE2; (21) MP4, VE1, 2, 3, 8, VK2, 3, 7, 9, VQ6, ZB1, ZC4, ZD2, ZL1, 3, 4; (28) VE1, 3, VQ3, 6, VS6, ZB1, ZD2, ZE, ZS6.
13.00	(21) VE1, 2, 3, VK2, 3, VO, VQ6, ZB1, ZC4; (28) VE1, 2, 3, 4, VO, VP7, ZB1, ZD2, ZE, ZS1, 6.
14.00	(14) VK3, 4, ZL3; (21) MP4, VE2, 3, VQ3, 4, ZC4, ZE; (28) MP4, VE1, 2, 3, 4, VO, VP7, ZB1, ZC4, ZD2, ZS6.
15.00	(14) VE7, VK2, 4, 5, VS6; (21) VQ3, 4, ZB1, ZC4, ZE, ZS6; (28) MP4, VE1, 2, 3, VO, ZB1, ZC4, ZD2, ZE, ZS6.
16.00	(14) VE6, 7, VK2, VS6, ZC4; (21) VE1, 2, 3, 7, VO, VQ2, 3, 4, ZB1, ZD2, ZE; (28) MP4, VE1, 2, 3, 4, 5, VO, ZB1, ZD2, ZS1, 6.
17.00	(14) VE7, VQ3, ZC4, ZD2, ZS2, 6; (21) VE1, 2, 3, 5, 6, 7, 8, VO, VP1, VQ3, 4, 5, ZB1, ZC4, ZD2, ZE, ZS2, 6; (28) VE1, 2, 3, 4, 5, VO, ZS6.
18.00	(14) VE6, 7, VK2, VQ2, 3, 6, VS9, ZC4, ZD2, ZS2, 6; (21) VE2, 3, 4, 5, 8, VO, VP8, VQ4, ZE, ZS2, 6, 9GI; (28) VE2, 3, 5, VP8.
19.00	(7) ZD2; (14) MP4, VE2, 3, VK2, VQ2, 3, 4, 6, ZB2, ZC4, ZS5; (21) VE2, 3, 4, VO, VP2, ZE, ZS6; (28) VP9.
20.00	(7) ZC4; (14) MP4, VE1, 2, VO, VQ2, 3, ZC4, ZD2, ZE, ZS1, 2, 6; (21) ZS6.
21.00	(14) VE1, 2, VO, VP6, ZD2.
22.00	(7) ZD2; (14) VP8, ZD2, ZS6, 9GI.
23.00	(14) VE1, 3, 6, 7, VP9, 9GI.

As the number of contacts becomes progressively greater with the passing years, it is necessary to keep the scoring system as simple as possible, as the tedium of making one's entry could easily result in a dropping off of entries. A simple system which is fair to most is thus preferable to a more complicated one which might give a more equal chance to all. It is suggested that the U.K. stations have now very little chance of winning the event, but in the three years since the introduction of the present system, G stations have been fourth, fifth and fifth, so the bias cannot be very great. However, all suggestions will be considered when the rules for next year are drawn up.

The Contests Committee would like to thank all competitors for their support.

Check logs are gratefully acknowledged from G2DUP, G2JN, G2QY, G3CXM, G3FIU, G3IYT, G3JKO, G3JUL, G3KAB, G3LCG, G4VF, G5GH, GM3CIX, VE3EIL, VE8OM and VO1BD.

International Transistor Exhibition

TICKETS for the Transistor Exhibition to be held at Earls Court, London, from May 21-27, 1959, may be obtained from Industrial and Trade Fairs Ltd., Drury House, Russell Street, London, W.C.2. The exhibition is being arranged in connection with the International Transistor Convention organized by the Electronics and Communications Section of The Institution of Electrical Engineers.

New Equipment

THE ELECTRONIC DEVICES EL-BUG

THE electronic key manufactured by Electronic Devices (Cheltenham) Ltd. under provisional patent No. 040460 is a self-contained unit using a transistor and two 4½ volt torch batteries, and is, therefore, suitable for use either at a home station or from a portable site. With this type of key dots and dashes are self-completing and the key lever is used only to start the character. The speed range in the model tested was variable between 6 w.p.m. and 25 w.p.m., but it is understood that the maximum speed may be raised in future productions. The setting of key speed is controlled by a potentiometer, which, together with an on-off switch, is located on the front of the instrument. The control contacts on the relay are terminated with a twin flex lead to which can be attached the requisite type of jack plug. The circuit arrangement is shown in Fig. 1.

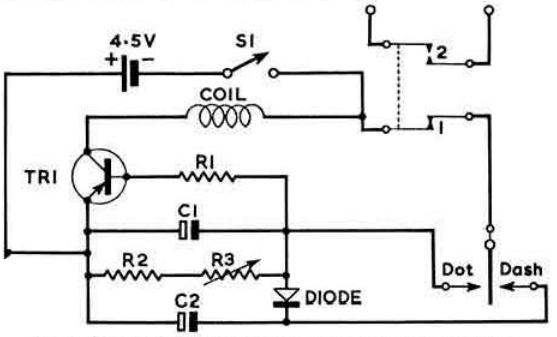


Fig. 1. Circuit diagram of the transistorized electronic key.

The operation of the keying circuit is as follows:

(1) On closing the power supply switch S1 the relay remains in its quiescent position with relay contacts 1 closed and 2 open.

(2) On moving the operating lever to the " dot " position the circuit containing R1-R2-R3-C1-transistor-relay coil-battery and relay contacts 1 is closed. This causes an oscillation of the relaxation type to develop, resulting in the periodic opening and closing of the contacts 1 and 2 at a " dot " frequency governed by the values of the circuit parameters and allows adjustment of the " dot " frequency.

(3) By moving the lever to the " dash " position C2 is brought additionally into the circuit in order to produce a dot/dash ratio of 1 to 3. The parameter values are set during manufacture and specially designed test equipment is used to set up an optimum mark-to-space ratio setting.

The mean current drain when keying is less than 15mA, and the batteries therefore, should last for a considerable period. With the power on but with the key not activated the battery drain was less than 20μA.

In use the key was silent and the large " paddle " was comfortable to use, whilst the instrument stood firmly on the operating desk without any tendency to move.

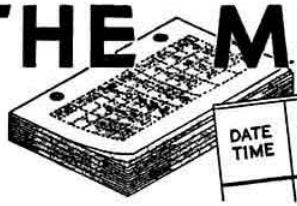
The key tested did not have any provision for " netting " but the manufacturers state that in all future models the switch will incorporate this function.

The finish of the unit is excellent, and can be recommended at the price of £4 17s. 6d.

The makers state that they hope to make available in the near future a de luxe model which will incorporate a full speed range and a variable mark-to-space ratio operative at all speeds. A transistorised tone generator will also be incorporated in the key, which will be completely self-contained.

The El-Bug electronic key is manufactured by Electronic Devices (Cheltenham) Ltd., of Wellington Road, Cheltenham, Glos.—R.F.S.

THE MONTH ON THE AIR



By J. DOUGLAS KAY (G3AAE)*

WHILE the continued requests for more support are beginning to produce favourable results not one single report has been received from members using single sideband. It is a fact that there is an ever-increasing number of members using this mode which, reputedly, has great advantages over other contemporary forms of transmission. There is no doubt that the best possible way to attract new recruits for s.s.b. is to show what results may be obtained on the DX bands. If no sideband reports are received during the next few months it will be presumed that no worthwhile DX is being worked from this country, and that the system has been grossly overrated!

DX Gossip

Danny Weil, who has been operating **VP2GDW** from Grenada since *Yasme 2* sank, has now appeared from Trinidad signing **VP4DW**. Before he moves into the Pacific area he will probably operate from VP3 and FY7.

The Cocos Island expedition came on the air on April 16 and caused quite a stir until April 19. Signing **TI9SB** on 14,305 A3a, and **TI9CW** A1 on 14,050 they were putting a terrific signal into Europe. QSLs should be sent to TI2HP.

Around 14,320 **VQ4ERR** was heard discussing his forthcoming DXpedition to the Seychelles with W0AIW, who will be accompanying him. The event is scheduled for August. It is hoped that they will operate c.w. as well as s.s.b. or at least answer c.w. calls. On almost the same frequency **ET2US** was saying that he hopes to operate from French Somaliland (FL8) for a week in the near future. He will operate both s.s.b. and c.w.

UA0IJ, who last May told GC3AAE that he was situated on Wrangel Island, now says that his QTH is Beringovsky in Zone 19. This backs up **RAEM** who avows that at present there is no activity either on Wrangel Island or Franz Josef Land.

Brunei is now represented by **VS5JA**, who has been heard on several frequencies in the c.w. portion of 14 Mc/s. While his favourite operating time appears to be between 10.00 and 12.00 G.M.T. he has also been heard between 23.00 and midnight. **VS5BY** (c.w.) and **VS5AD** (s.s.b.) are also known to be active on 14 Mc/s at the present time.

The unheralded advent of **YA1TD** and **YA1IW** has put Afghanistan back on the map in no uncertain manner. YA1TD's first G QSO was with G3MVV (Romford) on 28 Mc/s phone, when YA1TD said that he was running 3 watts to a whip aerial. YA1IW seems to prefer 21 Mc/s phone at present, but is said to be equipped to operate on all bands with 60 watts. YA1TD and YA1IW are both active from about 14.30 G.M.T. onwards. QSLs should be sent via W6DXI.

VK2FR (Lord Howe Island) is often to be heard on 14,130 kc/s around 06.00 G.M.T. ZL2GX and VK5MS control the queue, which while slowing down proceedings does prevent things from getting out of hand.

B.R.S.10167 (Bristol) who is extremely well informed about DX activity in the Far East, says that the following numbers of call-signs have been issued: VS4 (Sarawak) 4, ZC5 (Borneo) 3, VS5 (Brunei) 3, 9M2 (Malaya) 44 and VS1 (Singapore) 51. He offers to supply the QTH of any stations in the above areas, and inquiries (with s.a.e. please) should be sent to K. J. Creamer, " St. Valery," 26 Effingham Road, St. Andrews, Bristol 6.

In the various band reports the call-sign **4S7FJ** appears at regular intervals: it has a familiar ring as has his precision fist. Yes, Frank Johnstone has left Singapore and is now operating from Ceylon. His address is given in *QTH Corner*.

G8KS reports that **VP8CC** is now QRT, and was taken off by an icebreaker when the relief ship *John Biscoe* was unable to reach base due to ice. VP8CC is at Port Stanley en route for the U.K. where he is expected to arrive in June.

G3KGV reports that B.E.R.U. winner **VE7KX** will shortly be visiting the U.K. and has been granted a G call-sign. He hopes to operate RTTY while over here.

From **B.R.S.20104** (Harrow) comes a real fund of DX news. Much of this has been duplicated from other sources but he has several exclusive titbits as follows: rumour has it that **VR2DG** is going to ZM7 soon: **ZM6AS** has left Samoa for New Zealand, but another station will be operating from there in May: **XE4** *should* see some activity during May.

G6CL (Southgate) reports that the Italian Government has now issued licences to five U.S. military forces stations, and that they are authorized to use up to 300 watts input—the same as Italian nationals. Calls and locations are as follows: I1DFA (Naples), I1DFB (Livorno), I1DFC (Verona) I1DFD (Vincenza), I1DFE (Aviano). Mobile operation is not permitted.

Looking through the band reports that follow it certainly appears that 21 Mc/s has taken over the mantle of 14 Mc/s as the best band for really rare DX; there is no doubt that, at the present time, 21 Mc/s is excelling itself. With the longer hours of daylight the band will keep open until long past midnight to South and Central America, while the Oceanic and Far East stations will continue to be loud

Don Liebsch, W7ZOH, is located in one of the most sought-after States for W.A.S.—Montana. Don uses a Viking 2 transmitter running 130 watts to a tri-band beam, and a National NC300 receiver. (via G3AAE).

* *18 Fairfield Way, Barnet, Herts.*

and clear in the mornings and early afternoons, with Africa reaching its peak during the late afternoons and early evenings.

28 Mc/s is also holding up extremely well, but by the time that this is read it should have faded slightly as it always will with the advent of summer.

14 Mc/s, of course, is always good for rare DX but the continued prevalence of short skip QRM seems to have driven many of its former devotees to the comparatively quiet spaces to be found on 21 Mc/s.

28 Mc/s

As 28 Mc/s is likely to be the first to suffer from the declining sunspot activity we give it pride of place this month.

Full marks to Norman Miller **G3MVV**, a new and welcome contributor from Romford, who runs 100 watts to a two-band G4ZU beam. His receiver is a two valve converter feeding into a TCS12. His recent DX on phone has included the following: CR4AP (11.05, 28·1), VE7ZM (16.00, 28·2), XE2BM (14.17, 28·5), VU2PS (14.40, 28·2), CR7AQ (15.55, 28·2), W7CKE Nevada (19.30, 28·8), KR6HI (11.30, 28·2), VS6BJ (14.00, 28·2), W7MFU Utah (18.45), KL7OOT (19.35, 28·8), UA9KOU Zone 18 (14.05, 28·2), JA4HM (10.20, 28·2), W7EVP Idaho (18.47, 28·8), W7ZCA Nevada (19.40, 28·6), XW8AL (15.05, 28·2), W7OGX mobile in Nevada (17.50, 28·6), PJ3AG (13.35, 28·2), and finally the real plum YA1TD (15.05, 28·4). Further details of YA1TD were given earlier.

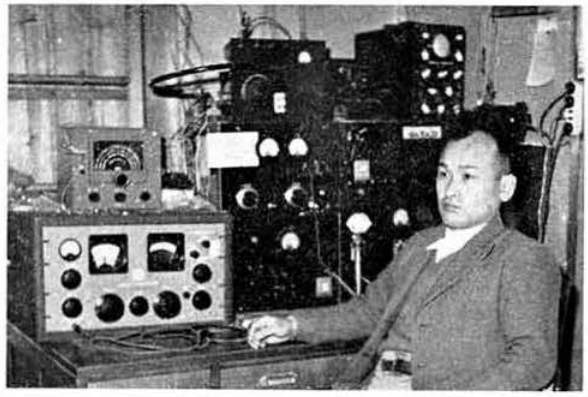
Another most welcome newcomer to these pages is Doug Edwards **G3DO** of Sutton Coldfield who reports phone QSOs with XW8AN (15.20), YS1O (18.20), YS1IM (22.20) and VP8DG Antarctica (19.10). **G3MEF** (Barnstaple) worked VS6BJ, FQ8HA, VS9ANS, FQ8AP, HZ1AB, VS9ANS and YN1AA on the key. VS9ANS is ex-G3JKH, and his QSO with G3MEF was his first with the U.K.

Alec Gilding **G3KSH** (Kenton) contacted CE1AD (19.50), KH6RR (20.04), KH6BJ (20.00), VP5FP (15.15), on c.w. and VK6GU (12.45), MP4BCI (13.00), on phone. Leslie Hill **G8KS** (Farnborough) talked to PY7SC Fernando de Noronha (12.10), 4S7FJ (17.42) and VU2PS (17.03). O. J. Russell **G3BHJ** (Norwich) contacted CR7EO and LU, KW6CB, SV0WB (Rhodes), UA9CM and VU2PS on phone.

Tom Higginson **GW3AHN** promises to report regularly in future. It may not be generally known that Tom has achieved the magnificent score of 254 countries worked (246 confirmed) using a maximum power of 25 watts. On 21 Mc/s alone he has worked 230 countries, which in all probability is a world record. Tom's other achievement is to have obtained an all-phone WAZ certificate, which is believed to be only the second awarded to a British Isles amateur. On phone GW3AHN talked to FS7RT, KS4BB and VP9L, while on the key he contacted KS4BB, YN1AA, YN1AFM and 4S7FJ. Yet another newcomer to this feature is **G3MMP** (Pinner) who concentrates mainly on 10 phone and reports working the following: VQ3HH, ZS3RO/ZS7, VS6EE, KR6HI, FQ8AP, CR7EO, XW8AL, VQ5FS, UA9CM and CT3AN.

B.R.S.20317 received phone signals from HI8GA (17.00, '250), VP1EE (21.00, '380), VQ8AV (14.50, '275), XE1AE (16.00), XW8AL (15.00-16.00, '350), and ZS5RO/ZS7 (17.00, '255). **B.R.S.20135** heard VP8CV, VE2AUU/VE8, XE2FL, VS1AF, VS9AL and VS9ANS and ZD2FNX on phone, as **B.R.S.22249** logged OA4IA (19.56, '200), SV0WB Rhodes (14.35, '700), XW8AK (14.45, '450), FB8CC (15.55, '200) and CT3AN (10.02, '100) to name but a few.

Phil Baker **B.R.S.21918** heard FB8ZZ (11.45) on c.w., and CR6BY (17.10), HS1V ("E"?), VQ8AV (15.05), VS9ANS (11.36), XW8AK (15.10), XW8AL (16.42) and ZD2CKH (14.02) on phone. **A.1743** records phone from ZS5RO/ZS7, FM7WQ, FQ8AT, ZS8I, OY1R, UI8KAE, VP8EP and VP2GDW, all heard on an 0-V-1 with an RF24 unit ahead.



Located at Tohoku, JA7AD is one of the most active Japanese stations on 21 Mc/s c.w. The rig runs 100 watts to a Zepp aerial, and the receiver is a Hammarlund SP600JX.

(via G3AAE).

21 Mc/s

G3DO worked four real plums on phone: FB8CD Comoro Is. (17.40), FB8XX Kerguelen (17.00), VS9MB Maldive Is. (18.55) and VP2SL St. Vincent (19.25). **G5DJ** (Southgate) talked to 9G1DA (08.25, '180), 9G1BA (08.20, '190), 9K2AY (23.50, '160), VE8AL Yukon (09.25, '160) and VR2BC (09.15, '230). **GW3AHN** misses nothing on this band, and on c.w. worked FG7XC, KH6PM, KS4BB, UA0KFG, UL7GL, VP2GDW, VP8EG, VP8EP, VQ8AD, XZ2TH and 4S7FJ, while on phone he logged FM7WS, KB6BH, KS4BB, KW6CL, UO5AA, VP2DJ, VP2GDW, VQ8AD and VR2BC. A most effective answer to the advocates of higher power!

A welcome is extended to Ben Bowyer **G3GCD** (Chesterfield) who reports for the first time. On phone he worked CP1CJ, FQ8AW, HH2Z, HI8GA, HI8CJY, HP1LB, I5GN, KR6BL, PJ2CE, TG7JD, VP1EE, VP2AB, VP3MC, VP4LP, VP8DK, XW8AL, YA1IW, YN1SV, 9M2GB and VR2AZ, while on c.w. KH6CYO, VS9MB, XZ2SY and LA2JE/P were contacted as well as other excellent DX. Ben uses 120 watts to a cubical quad 30 ft. high, and listens on an HRO.

G3KSH records KG1AQ (16.10), HS1C (17.20), 9M2DW (16.30), 4S7FJ (17.25), FQ8HE (20.50), VP2DGW (20.55), VS9MB (21.40) and VQ3CF (20.15) on c.w., and 9M2DW (17.20), VS9MB (18.53), 4S7FJ (18.59) and 9G1CT on phone.

QTH CORNER

AP5HQ Islam Ameen, 8 Div. Sig. Regt. Quette, West Pakistan.
FB8XX via FB8BC.
FG7XE Georges de Vipart, 29 Rue Henri IV, Pointe a Pitre, Guadeloupe.
VK2FR Trevor Donald, Lord Howe Island, via Australia.
VK9AD via VK5AB.
VP2SL Post Office Box 80, St. Vincent or via K4SXO.
VP8EG via G8KS.
VS4BA via W5UX.
VS9MB R.A.F. Gan, B.F.P.O. 180, Maldive Islands.
YA1IW & YA1TD via W6DXI.
4S7FJ Frank Johnstone, R.A.F. Katanayake, Ceylon.

BARBADOS. The new QSL Manager is Arthur Farmer (VP6AF), "Sandgate," Brighton Road, St. Michael, Barbados, B.W.I.

G8KS talked to VS9MB (18.35), VP8EG South Orkney Is. (19.45), FG8XE (20.42), VQ8AD (16.30), 9M2GA (17.07), ZD1EO (15.17), VP2DJ (21.34), VP2GW (20.15) and FA8XS (who was on c.w.) in the Sahara Desert. Harry James **G3MCN** (Liverpool) was delighted to find YA1IW at 17.00 on 21·125, and also worked HS1E and VP2AB. Harry has 113 countries confirmed from a total of 147 worked in 16 months operating.

G3KGV (Sunderland) does not submit a lengthy list but those he does record are certainly choice and all on c.w. on a band that many think is primarily a phone band. G3KGV worked FK8AB, VK9AD Norfolk Island, VS9MB, FQ8AG, VU2AL, 4S7FJ, XZ2TH, VP8CC, VP8EP and HV1CN. **G3BHJ** used phone for CP1CJ, FG7XE, FM7WS, OX3KW, VE8AL, VE8AB, VP2AB, 9M2DQ and KR6DU, and c.w. for KS4BB and VP2GDW.

B.R.S.20135 (Newport, I.o.W.) logged phone from VP8DG, VP8DI, VP8DW, FM7WS, ZD1EO, HH2CL and HZ1AB, while **A.1743** (Harrow) records FB8XX, VQ3DQ, ZD1EO on phone with FB8XX also heard on c.w. **B.R.S. 2292** lists c.w. signals from CE1AD, CR7BN, KL7BZO, UA0SK, WP4API (Novice in Puerto Rico), and KS4BB, and **A.1657** (Leeds) found VU2RN, OX3KW, PZ1AG, XZ2AY and YA1AW on phone.

A.1583 (Penryn) logged SV0WB Rhodes (19.32), VP8DG (19.54), OX3KW (20.15), HC1AGI (18.54) and KR6QM on phone. **B.R.S.10167** lists YA1IW, FG7XE, KG6BV, KM6BL, BV1USC, 9M2GA, PZ1AG, VP8DW, OQ0PG, VS5AT, VP2SL, and VP8CQ also on phone. **A.1583** has a *confirmed* country total of 237 countries on 21 Mc/s, a most creditable, and probably unique, performance on the band.

Last but by no means least over to **B.R.S.20317** who heard CR5AR (22.00, '090), CR7AG (19.30), HH2CB (23.30, '010), KS4BB (23.30, '050). XE1AX (21.45), XZ2TH (18.30, '055), 4S7FJ (18.50, '060), FS7RT (21.25, '250), HI8GA (20.00, '200), KS4BB (22.45, '260), VP2AB (23.30, '230), VP5AB Caicos (23.40, '250), VP8DW (21.00, '200) and XE0MHC (23.40, s.s.b.).

14 Mc/s

Keith Robinson **G3BHQ** (Chesterfield) used c.w. to contact FB8XX Kerguelen (18.15, '040), OR4RW Antarctica (20.35, '048), CR4AX (19.15, '080), VE8BN Yukon (20.45, '048), PY8HC (21.17, '100), DU1OR (18.50, '084), and VP8EP (20.35, '020), while he heard CR8AC (14,048). **G8KS** reports YK1AT (12.00) and FB8XX (17.30) both on c.w., while **G3DO** added to his mammoth DX score by working VK2FR Lord Howe Island at 06.40 on 14,130 kc/s.

G3KSH worked VU2AJ (01.05), VP8EP (02.19), HH2LD (21.10), 4S7FJ (20.45), OR4RW (21.15) and VK0CC (19.46) on c.w., which mode was used by **GW3AHN** for VP2GDW.

G3AAE records YS1O (00.30, '015), SU1IC (08.20, '066), HH2LD (23.00, '015), TI9CW Cocos Is. (01.00, '050), VP4DW (02.25, '075) and CE0AC (03.00, '010) on c.w., and VE6QG/SU (01.30, '182), TG9AZ (05.10, '172), VP2AR (07.45, '180), XE1UV (08.00, '180), PZ1AP (00.15, '116), and VK2FR (07.30, '128) on phone.

G3MEF, whose aerial is a half-wave dipole inside a building and only 15 ft. above ground worked OR4RW Antarctica, JA8AA, OY1L, ZD2MW, UL7KAR, SM5WN/LA/P, and FF8BZ on c.w.

Phil Baker **B.R.S.21918** (Hayes) reports hearing c.w. signals from CR6AP (19.10), VP8BK South Georgia (19.46), and VS9MB (20.10). **B.R.S.20317** provides the following useful times and frequencies: CR4AX (20.00), FB8ZZ (17.15, '030), HH2LR (23.20, '005), HK0AI (23.45, '030), KS4BB (05.30, '050), KX6CW (10.00, '050), OR4RW (19.30), TI9CW (00.00, '050), UM8KAB (17.00, '050 and '025), VK0AF (16.40), VP2GDW (23.45, '075), YJ1DL (09.20, '036) and YK1AT (13.00, '040). **B.R.S.2292** logged DU1OR, FM7WP, OK7ZH/M, OR4RW, VP8BK, VP8EL and VS9MB amongst others on c.w.

3·5 and 7 Mc/s

Once again W. Wilkinson **B.R.S.20317** (Bromley) provides the sole report on 3·5 Mc/s activities. Bill logged PY7AN (05.50, '512), FA8BG (06.30) and four UA9s, while on 7 Mc/s he lists KP4CC (00.40, '010), W6YMD, W7ZMD, VE8TO (07.00), VP5FP Turks Is. (06.15, '012), VP7BT (06.50, '005), and VP9CR (05.15, '013).

A first report comes from **B.R.S.22249** who is with the R.A.F. at Gaydon. He reports hearing YV5AL (03.15, '020), KP4ADR (04.09, '030) and most UA districts. Charles Harrington **B.R.S.2292** (Hounslow) heard PY2, 3, 4 and 7 in quantity, FA3 and 8, UO5KAA, and most districts of the U.S.A.

From **G3CHW** (Bristol) comes news that a bogus PX1AA is operating on 7 Mc/s c.w. again. This station tells his contacts to QSL via G3CHW, who has no knowledge of him.

On *Top Band*, **G3KOX** worked an OK using an all-transistor transmitter running 100 mW input. Good show!

Late News

IP1ZGY came up on 14 Mc/s c.w. from the Pelagic Is. in the Adriatic during the weekend April 25-26. While this operation may not be given country status, it is a good one for WAE and WPX. G8TS and G3AAE were two of those lucky enough to work him. QSL's should be sent via IT1TAI.

TI2HP and VE3MR are returning home from the Cocos Is. (TI9) via FY7 and PZ from both of which countries they will be active on s.s.b. and c.w. for one or two days.

W1WPO of A.R.R.L. Headquarters reports that Serrana Bank (KS4BB) will be given DXCC country status as from August 1. From the *W.G.D.X.C Newsletter* it is learnt that SU1KH is going to the Yemen in the near future and hopes to operate as 4W1KH on 15 and 20 m. phone. UA1CK is planning to go to Franz Josef Land in July and August and will operate on all the h.f. bands. DL9PF will be operating from Luxembourg from June 5 to 13 and from Andorra from July 20-30.

The World-wide OK7 DXpedition has arrived in Albania and will be using the OK7HZ/ZA.

MP4BBW is hoping to operate on s.s.b. from Das Is. (MP4D) and Trucial Oman (MP4T).

During his recent world tour "Uncle Dave" (W2APF) called at Frankfurt/Main, Germany where he met (left to right) General J. W. Stilwell (DL4FPE), Col. W. L. Martin (DL4SD) and Col. "Harry" Longerich (DL4RX).

Operating Awards

Judging by remarks heard on the air, and by several queries received in the post, there seem to be several points regarding the rules governing the DXCC and WAZ awards which need clarification.

For all R.S.G.B. awards there is a rule that a minimum report of R3 T8 for c.w. and R3 S3 for phone contacts will be required, but there is no such stipulation for either DXCC (A.R.R.L.) or WAZ (*CQ Magazine*). In other words, any report is acceptable provided it shows that a two-way contact has taken place. With special reference to DXCC it should be noted that for phone contacts it must be stated on the QSL card that the station submitting the claim was on phone and include an appropriate report: there is no stipulation that both stations must be on phone. This is not the case with the phone WAZ award where all contacts must be two-way phone.

The small number of phone WAZ certificates issued shows that it is indeed a difficult feat to achieve. Now that JT1AA and JT1YL have been active on both phone and c.w. from Zone 23 (JT1AB has recently appeared on the bands), the difficult ones appear to be Zones 17, 18 and 19, where Russian phone activity is very low. However, in the March issue of *CQ Magazine*, **W2DEC** reports that UA9AA, UA9CM and others are active in Zone 17, UA9VB, UA9O1 and UA0KAR in Zone 18, and UA0KQB and UA0LA in Zone 19.

Full details of both the DXCC and WAZ awards may be obtained from the issuing organizations, while a leaflet covering the requirements of all R.S.G.B. operating and listening awards may be obtained by sending a stamped addressed envelope or I.R.C. to Headquarters.

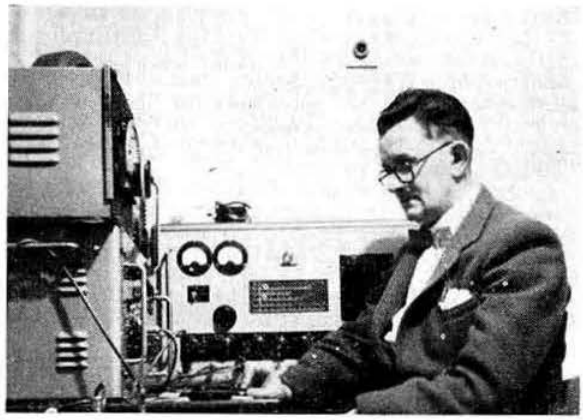
Acknowledgment

A special word of thanks is offered to **W5ADZ** and the **West Gulf DX Club of Texas**, who have most kindly volunteered to put the Society on the list of recipients of the air-mailed edition of the *WGDXC Newsletter*. This club really has its finger on the pulse of the world's DX news, and it is hoped that these columns will, in the months to come, contain a great deal of up-to-the-minute information from this source.

* * *

Well that is the end of a really bumper month on the DX bands.

Keep up the good work, and remember to send in reports to arrive on the 18th at the latest, with all times in G.M.T. please.



One of the best known sightless radio amateurs is Leslie Knight (G5LK), seen here operating his present station at Mitcham, Surrey. In this picture, the Minimitter Mercury transmitter used in conjunction with a three-band ground plane for 14, 21 and 28 Mc/s is in the background while directly in front of G5LK is the 2m transmitter, built by G3HBW, which has a QQV06/40 in the p.a. modulated by a pair of KT66. On top of this transmitter is an Eddystone 888 receiver and a G6XY modified version of the Wallman 2m cascode converter. The v.h.f. aerial comprises a pair of slots with reflectors.

Shortwave Listeners' Contest

THE North London S.W.L. Group is arranging a listeners' contest for the 24 hours of May 24, 1959, and details of the rules may be obtained by sending a stamped addressed envelope to Clive Green (A.1515), 5 Weir Hall Gardens, Edmonton, London, N.18. All bands from 1·8 to 28 Mc/s will be used.

Michigan Week

FROM May 17 to 23, radio amateurs in Michigan are holding a special event to tell other amateurs all over the world about their state. QSL cards for contacts during this period should be addressed to Michigan Week Headquarters, Lansing, Michigan, U.S.A.

Frequency Predictions for June 1959

BAND	NORTH AMERICA East Coast	NORTH AMERICA West Coast	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
M.U.F.	21·5 Mc/s 2300	18 Mc/s 1800	27 Mc/s 2000	28·5 Mc/s 2000	29 Mc/s 1300	26 Mc/s 1000 or 1800	25 Mc/s 1600	24 Mc/s 1700	25 Mc/s 2200 LP
28 Mc/s	2300	1800	2000	1900/2015	1000/1800	1000 and 1800	1600	1700	2200 LP
21 Mc/s	1800/0030	1800	1730/0300	1030/1130 1700/0300	0600/0830 1330/0000	0200/0000	0400/0730 1000/2300	1130/2200	0700/0900 LP 0830/1200 SP 2130/0300 LP
14 Mc/s	2300/1000	0700/1000	2200/1000	2200/0600	1830/0200	1400/0830	1600/0230	1800/2330	1330/1800 SP
7 Mc/s	0400	0600	0400	0400	0000	2100/0430	0000	2000	2000 SP
3·5 Mc/s	0400	0600	0400	0400	0000	2300/0100	0000	2000	2000 SP

These predictions are based on information provided by the Engineer-in-Chief of the Post Office. Times are G.M.T.

R.S.G.B. 21/28 Mc/s Telephony Contest 1958

Increased Support and Higher Scores

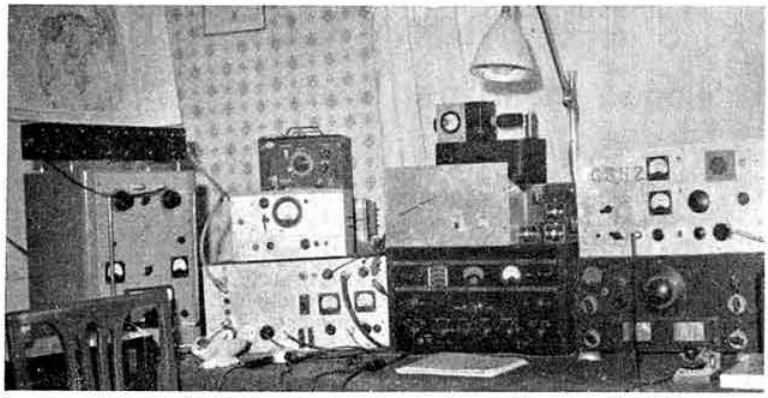
THE third R.S.G.B. Telephony Contest held on November 22-23, 1958, produced a much larger entry than previously—172 entries and 24 check logs—yet Doug. Edwards (G3DO) held his own against the increased competition and is again the winner for the third year in succession! His score of 4,610 points came from 408 contacts and bonus points from 129 of them, one less than last year.

In second place this time, with 4,345 points from 392 contacts is R. W. Yearwood (G3KGY) who has come up from ninth place while N. I. Bower (G5HZ) moves up to become third on this occasion. In the overseas section John Tyrrell (ZB1DC) leads with 3,345 points from 318 contacts and an overall placing of sixth; H. J. Best (9G1AA) is second amongst the overseas contingent with 3,140 points, followed by last year's leader, R. F. B. Featherstone (VQ4RF) with 2,980 points.

It seems that the efforts made to publicize the Contest are now producing results overseas but there were several complaints that there are not enough stations active in GC, GD, GI and GW. However, this seems to be the only grumble from overseas and many entrants commented on the very friendly atmosphere and high standard of operating exhibited by those taking part. The latter point is borne out by the entries as there are very few logging errors; the really troublesome matter seems to have been the change in the rules whereby there was a further 50 points for each additional ten G3 stations worked. The wording of the rule did not stipulate whether this was regardless of which

Call-sign	Points	PLACINGS		Call-sign	Points	PLACINGS		Call-sign	Points	PLACINGS	
		Home Position	Over-seas Position			Home Position	Over-seas Position			Home Position	Over-seas Position
G3DO*	4610	1		ZC4PN*	1580		23	CN8IU*	715		60
G3KGY*	4345	2		VE2AFC*	1565		24	W4KJE	710		61
G5HZ	4175	3		EA7GF	1550		25	K1CIE	700		62
G3HCU	3885	4		W8NWO*	1530		26	K9ALP*	690		63
G3JAY	3410	5		G2FUU	1520	36		G6CL	685	54	
ZB1DC*	3345		1	G6PR	1520			OH3SE	685		64
G3KFT	3330	6		CT1JD	1515		27	W1EXZ/VE2	655		65
G3JZK	3170	7		G3DNR	1500	38		DL1YA	630		66
G2QT	3145	8		OZ5SQ*	1500		28	W1KVG	630		
9G1AA*	3140		2	W1QWI*	1470		29	F8XP*	615		68
GW3AHN*	3085	9		G3HKJ	1440	39		G3HWF	610	†	
VQ4RF*	2980		3	SP7HX*	1435		30	OH5PN	605		69
G3YF	2915	10		1INE	1435			G3MXP	580	55	
G3CEG	2795	11		K4ZCP*	1410			SM5BRS	565		70
GM3WO*	2755	12		UB5DW*	1410		32	OA1A*	560		71
G3CLG	2675	13		UR2CU*	1410			G3GXO	560	56	
G3MJL	2620	14		ZL3RB*	1410			G3KWH	560		
G6XN	2580	15		G3LCH	1405	40		W3HQO*	540		72
CT1PK*	2560		4	DL6QIA	1395		36	ZS5OA*	525		73
OE2YL*	2405		5	G6UT	1390	41		K4DLC	520		74
G6ZY	2380	16		G3IGW	1390			W3NVS	515		75
G2ACC	2355	17		SM6AVM	1385		37	K0ITF*	505		76
11ZCT*	2355		6	SM5CZD	1325		38	G8TK	500	58	
G3AIZ	2340	18		G3MA	1325	43		K6EVR*	500		77
SM3BCZ*	2295		7	G3CMU	1235	44		LA5QC*	475		78
OH5RZ*	2290		8	SM5AJU	1235		39	G3WP	430	59	
OE1FF	2255		9	YU3VV*	1220		40	G3LHI	430		
G5TO	2250	19		VK2AKV*	1205		41	W2CGJ	430		79
G3JYB	2225	20		VE2AVQ	1200		42	HB9DB*	405		80
GM3GUI	2190	21		W8WT	1180		43	W4WSF	390		81
GM3EOJ	2180	22		G3BDS	1155	45		LA2AD	375		82
G3FFH	2140	23		EA3JK	1130		44	G3JVU	375	61	
EA3LA*	2125		10	G3EJF	1125	46		VO2NA*	340		83
GM3BCL	2085	24		G8QZ	1115	47		OH2KO	335		84
OH2XK	2055		11	VE7ZM*	1115		45	CO2US*	330		85
G3WW	2040	25		UB5KAB	1080		†	G8KU	325	62	
DL7GQ*	2020		12	CT1FM	1030		46	W9VNG	320		86
G2AJB	1980	26		G3MPB	1020	48		W1ZSD	320		
G3DBJ	1970	27		VE2YU	985		47	G3FLR	315	63	
G3AGN	1945	28		VE2PZ	970		48	SM7AFK	305		88
EA7CD	1920		13	OH6OM	960		49	K4OAQ	290		89
GM3FRZ	1870	29		ZB1CR	955		50	EA8AH*	285		90
GM3BCD	1835	30		G2HPF	930	49		CX2AY*	265		91
LA1K	1820		†	11KF	925		51	SM5DX	250		92
G2BVN	1800	31		VP3HAG*	875		52	G3KRC	235	64	
K2CJN*	1785		14	G3MMP	865	50		OZ5UF	230		93
G2JB	1785	32		SM7BZD	865		53	VS6BJ*	205		94
11UA	1760		15	VE1YB*	865			OH2VZ	200		95
9G1BA	1745		16	ZL2RT*	830		55	G3NAC	180	65	
11ANN	1735		17	G3LFU	825	51		JA1BF*	180		96
11PAC	1725		18	G3HZE	805	52		F9DW	170		97
G3BHJ	1695	33		G2AHL	775	53		PA0SNG*	150		98
G2HFC	1670	34		K8CFU	760		56	EA3MO	125		99
IT1ZDA	1640		19	UA1CK*	740		57	OK1KKA	120		†
OE8KS	1635		20	W8KG	735		58	JA3IS	115		100
EA7CQ	1630		21	VE3BMB*	730		59	K8AEY	115		
G2DC	1625	35						UF6FB	60		102
11AM	1620		22					W1RWU	55		103

* *Indicates certificate winner.* † *Club station.*



G5HZ moved up to third place in the 1958 R.S.G.B. 21/28 Mc/s Telephony Contest with a score of 4,175 points. Equipment shown in this picture includes AR88 and HRO receivers, a BC221 frequency meter and a Labgear LG300 transmitter. A 25 watt rig, normally used, stands on top of the HRO. G5HZ has also held the call-signs VU2JT, VS1DZ and GI5HZ.

band was in use and indeed most entrants scored accordingly. In some cases however logs showed that the bonus had only been claimed after ten contacts on each band and the logs concerned have therefore all been re-scored to bring them into line. In one or two cases a completely different scoring system had been used and again re-scoring was necessary.

Equipment

Equipment in use has not varied much since 1957 with G3DO again using his LG300 transmitter, Eddystone 888 and AR88 receivers and beam; similar equipment was used by G3KGY. However, without getting involved in the commercial equipment controversy the Contests Committee must point out that very creditable performances were put up with low power home-built equipment. G3JAY, whose first contest this was, had a home-built transmitter running 80 watts input to the p.a. while for receiving he used a modified R.1155 and an R.F. 24 unit. GW3AHN, the leading Welsh station, used a home-built transmitter (input 20 watts) and an Eddystone S.640 to get into 11th place.

Comments

Comments on the contest were all favourable but a few entrants had trouble with gear: G3JAY mentioned previously was on the point of throwing the modulator out of the window when it decided to work properly; OE1FF had a v.f.o. that decided to give up after many years' service and precious time was lost while repairs were made. W3HQO had been looking forward to the contest all year and "right in the middle the rig conked out," while K8CFU had local power line noise that made operating nearly impossible.

Conditions seem to have varied: VQ4RF found short skip very frustrating—at times he could hear G stations but could not be heard. HB9DB found the short skip to his advantage on 21 Mc/s but heard nothing on 28 Mc/s. PA0SNG could only work GM and GI on 21 Mc/s.

TROPHIES

Whitworth Trophy: Leading British Isles station and highest-scoring station in the Contest—D. A. G. Edwards (G3DO).

Metcalfe Trophy: Best check log from a non-licensed British Isles member—R. B. I. Rutherford (A.1495).

Certificates

Runner-up, G Zone—R. W. Yearwood (G3KGY).
Leading GM station—J. S. Bell (GM3WO).
Leading GW station—T. Higginson (GW3AHN).

The leading stations in each overseas country will also receive a certificate in accordance with Rule 10, as indicated by the asterisks in the table of results.

Check Logs

Check logs are gratefully acknowledged from the following: A.1495, A.1544, A.1623, A.1741, A.1745, B.R.S. 20249, B.R.S. 21624, B.R.S. 21762, B.R.S. 21780, B.R.S. 21918, G2MI, G3JVZ, G3KAB, G3LMH, I1-10303, I1-10307, I1-10311, I1-10351, OK1KIR, OK3KRN, OK3WW, VE6IN, VK3HL and ZC4IK.

It is intended that a receiving contest shall be run in conjunction with the 1959 contest and the Contests Committee looks forward to receiving an even greater number of logs from listeners.

Radio Controlled Models

ARTHUR O. MILNE (G2MI), 29 Kechill Gardens, Bromley, Kent, would like to hear from a member of the Post Office staff who is interested in model control.

Fifth International V.H.F.-U.H.F Convention

Saturday, May 30, 1959

Prince of Wales Hotel, De Vere Gardens, Kensington, London W.8.

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 Grand Free Draw for many valuable prizes	9 p.m.
Convention ends	10.45 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—22/6.

Tube Stations: Gloucester Road, High Street, Kensington and Knightsbridge. Buses: 9, 46, 52, 73.

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

FOUR METRES AND DOWN

BY F. G. LAMBETH (G2AIW) *

THE Fifth International V.H.F./U.H.F. Convention sponsored by the London U.H.F. Group and the R.S.G.B. will be held at the Prince of Wales Hotel, de Vere Gardens, South Kensington, W.8, on May 30. This Convention has now come to be accepted as one of the v.h.f./u.h.f. events of the year, and the organizers have gone to some pains to ensure that the 1959 function shall lose nothing in interest compared with those that have gone before. Dr. Kaiser, of Sheffield University, is to speak on " Meteor Scatter Propagation," while Mr. I. M. Ross, Services Electronic Research Laboratory Extension (Admiralty) Harlow, will lecture on " Parametric Amplifiers." Vic Hartopp (B.R.S.15304) of J-Beam Aerials Ltd. will discuss v.h.f. aerials. The Society's President, Dr. R. L. Smith-Rose, will be the guest of honour at the Convention Dinner in the evening. Members are asked to bring items of equipment, however small, for the exhibition which will form a part of the Convention.

F3SK reports that F8NH, F8MX, F9CQ and himself hope to be at the Convention. F8MX and F9CQ intend bringing their new " flat lines low-noise " 435 Mc/s converter, whilst F3SK will have the modified 145 Mc/s portable semi-transistorized transmitter/receiver and the new, entirely valveless transmitting-receiving equipment with him. The receiver uses seven transistors, with a regenerative detector in the i.f. system. It works on 12 volts and has a power consumption of only 90 mW. F3SK will require a 6-volt car battery and the services of a mobile station near the hotel to demonstrate the gear. Offers of assistance should be sent to G2AIW.

GM6WL.

It is with the very greatest regret that we report the passing of "Jock" Kyle (GM6WL) on April 15. "Jock" was our most faithful correspondent in Scotland, and a stout worker for v.h.f./u.h.f. at all times and for many years. His work on 70 and 23cm had given pleasure to himself and a great deal of useful knowledge to others. He will be sadly missed.

Two Metres

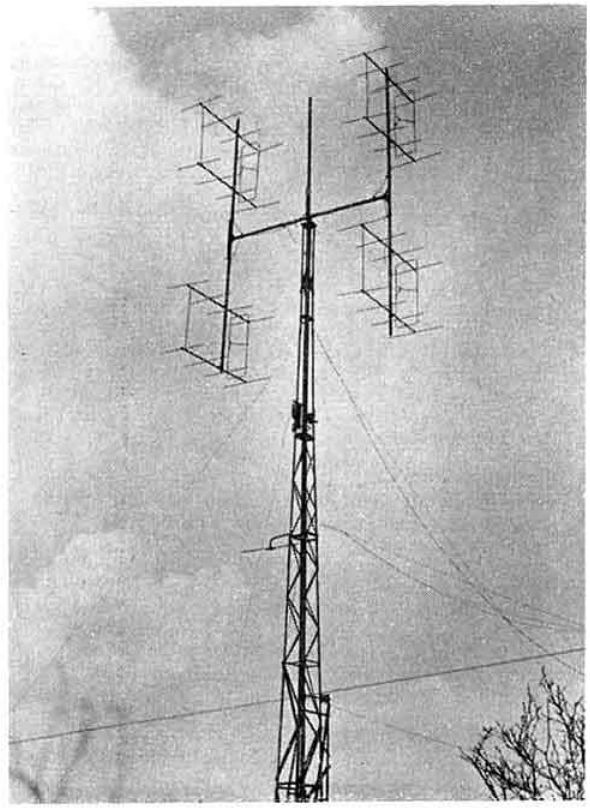
It is probable that the auroral period between March 25 and 29 was the most interesting event during the last few weeks.

G3FEX (Storrington West Sussex) is using a table top 90 watt rig, with a QQV0/6-40 in the p.a. The aerial is a gamma matched 4 element Yagi at 28 ft. and the converter a G2UJ type, to which it is hoped shortly to add a cascode stage (ECC88). The counties worked have been pushed up to 25. An SCR522 is being installed in the car with a home-built 14 valve double conversion superhet and a " halo " aerial. G3FEX will be active /M between 18.00/18.30 on weekdays.

G5CP (Chesterfield) now on 145·64 Mc/s hopes to be more active—both fixed and mobile—this summer.

G2HDR (Bristol 9) heard little apart from locals. On March 28 G5BM was logged working a GM by auroral reflection. G2HDR says the new Band Plan is posing problems for those who use FT243 crystals, as the only available ones on 8 Mc/s appear to come up on the frequencies we are asked to avoid. (A little careful grinding or soldering seems indicated in such cases—G2AIW).

G3HAZ (Birmingham 31) notes plenty of activity in the Midlands but it has lately been mainly of " local " variety. New stations are G3AQX and G3KAG in Derby which now boasts a very strong v.h.f. contingent. G2AFD has opened up in Malvern and G6ZP has appeared again. G3ENY is on with a good signal from his new QTH—still Bridgnorth, but better situated v.h.f.-wise. The brightest spot of the month was March 27 when an aurora developed in the afternoon. It was first noticed at about 15.45 G.M.T. but only odd carriers with the characteristic rumblings were in evidence. At 16.25 G4QA and G2BDQ were worked.



The 40 element 144 Mc/s beam used by G3CCH who came first in the Low Power Section of the 144 Mc/s C.W. Contest 1959. Each 5-over-5 slot fed Yagi is fed with 70 ohm coaxial cable which goes to a 4:1 linear matching transformer at the centre of the array and thence via 70 ohm feeder to the transmitter. The home-made tower tilts so that adjustments can be readily made to the aerial. The counterweight for the tower is approximately 200 lb. of concrete blocks. A report on the Contest appears on page 548.

* *21 Bridge Way, Whitton, Twickenham, Middlesex.*

Later DL6, OZ, and various Gs were heard and a report from G5BM noted that GM3DGI was calling G3HAZ. GM3EGW was heard weakly on the 28th by G3HAZ. G6JY was logged one evening but could not be raised, though he had a good QSO with G3BA. G3HAZ sends quite a few " new " frequency measurements, but suggests that the 300 kc/s bandwidth might have been given to Zone 6 and not Zone 8 as it will be pretty hectic in the area when there is a " real " opening and everybody comes on at once!

G5DW (Bridgwater) says the G2NY sked is kept every day which adds further proof that 2m is probably the best band for regular contacts; it is always possible to have a solid QSO over a 200 miles path. GI3GXP is a good signal due to increased aerial efficiency at his end, and was S9 on phone on April 5. G5DW has a new aerial in production, two 13 element Yagis stacked, which he hopes will be an improvement on the 12 element array. His frequency is 144·077 Mc/s.

G5MR (Hythe, Kent) was alerted by G2JF for the aurora on March 27, and DL3YBA, G3FAN and G3HAZ were heard by this means, but no contacts were made. On the 28th visual aurora was reported from Southern England and was actually seen at Hythe by G5MR's daughter. Unfortunately no operating was then possible for G5MR.

G3MED (nr. Northwich) has been mainly occupied with the s.s.b. equipment which is now on the normal operating frequency of 145·351 as also is a QRP mobile rig. There is some difficulty in obtaining sufficient drive from the 5763 class A stage to the QQV06/40 in class B. After carrying out many tests with various stations it has been found that s.s.b. is almost as readable as c.w. (and in some cases better than c.w.—e.g. under bad fading) at strengths of S2 downwards. With a similar powered p.a. it has a gain of 6db over an A3 transmitter. After one or two QSOs with G5US (who is now on s.s.b. from Aldershot) under weak signal conditions, they are convinced s.s.b. provides considerable advantages over A3. Over long distances, with signals at S6 and lower, stations who can tune s.s.b. fairly easily, prefer it to A3. G3CCH's s.s.b. frequency is 145·41 Mc/s. On the 15/16th G3MED heard PA0LQ although the pressure was down to 995mb. During his sked with G5YV his signals were S2/1/3T9 on the 15th and S2T9 on the 16th (which is his average signal).

B.R.S.1579 (Larkhall, Lanarkshire) says the auroral display of March 26/28 was really wonderful there.

GM2FHH (Aberdeen) had a very good time during the March aurora, although only one overseas station (PA0EZ) was worked.

OZ7BR (Lyngby) says that Danish and Swedish amateurs have an activity contest on the first Tuesday in the month from 18.00 to 24.00 G.M.T. OZ7BR is using an s.s.b. transmitter with 150/175 watts peak envelope output (QQV06/40 in class AB2). This new p.a. has been running very well, and is driven by a QQE03/12 class A buffer, which in turn is driven by the balanced mixer (14·3 + 130 Mc/s), an ECC81. OZ7BR reports that OZ7IGY is continuing operation from 12.00/24.00 G.M.T. daily until at least the end of June. (Transmissions are made simultaneously on 144·006 and 432·018 Mc/s). At least one station in Holland is using s.s.b. (believed to be PA0OTC). The station was heard on February 18 calling "CQ S.S.B. Great Britain."

G3BDQ (St. Leonards-on-Sea) has been on the band since last June, and has worked both F9CQ and F8MX, whom he hopes to meet personally at the Convention on May 30.

G4LX (Newcastle-on-Tyne) reports renewed activity in the area, with G2BDQ, G3IOE, G4LX, G4QA and G6JY regularly on the band. Aurora affected 50 Mc/s signals on March 25/26 but not 144 Mc/s propagation. On March 27, however, 144 Mc/s signals were being reflected by the aurora. Commencing at 14.20 G.M.T. and finishing at 16.56 G.M.T., the following were heard in Newcastle, by G2BDQ, G4LX and G4QA: DL3YBA, 6QS, OZ3NH, OZ4K, G2JF, G3EFT, G3FAN, G3KEQ. G4LX had QSOs with DL3YBA and G3KEQ while G2BDQ worked DL3YBA and G3FAN. G4QA had a QSO with a station in the Birmingham area. On March 28 the aurora again appeared at 14.37 G.M.T., but died out at 16.36 G.M.T. During this opening G4LX had QSOs with GM3HLH/A, GM4HR and with G5BM. The Scottish stations were heard working SM and LA stations which were inaudible at Newcastle. DL3FM and OZ2BB were heard however. The aurora appeared again at 17.52 G.M.T. on March 28 when G5BM and GM3HLH/A were consistent signals until 19.25 G.M.T. At 20.15 the aurora built up again, dying out at 21.07. Finally it reappeared at 22.27 G.M.T. when several phone carriers were observed. Only G3JZG was heard on c.w. at 23.00 G.M.T. The aurora finally ended at 23.53 G.M.T. On March 29 the aurora commenced at 15.05 G.M.T., but the only c.w. signal identified was GM3HLH/A. On March 30, no aurora was observed, but slight aurora was again noticed on March 31 between 17.45 and 19.30 G.M.T. On April 10 there was a very strong aurora in the late afternoon but there seemed to be no 144 Mc/s activity.

News from Wales

GW3MFY (Bridgend) has ground a crystal for the new Zone but finds his signal is down about 6db, probably due to r.f. loss in the aerial balun. The best dates in the period were April 2, 3 and 4 when G3KBS/P (nr. Gt. Malvern)

V.H.F. QSY

Following the re-arrangement of the British Isles Two Metre Zone Plan announced in March, 1959, members who wish to acquire crystals for their new zones or have crystals for disposal on an exchange basis, are invited to send details for inclusion in this space. Requests should be addressed to " V.H.F. QSY," R.S.G.B. BULLETIN.

Crystals Offered

By G3BYO, 18 Kent Road, Mapperley, Nottingham. 8007·29 kc/s (by Reeve's Sound Laboratories, ¾ in. spacing) for Zone 2.

By G3FXP, 68 Eastfield Avenue, Melton Mowbray, Leics. 8025 kc/s (FT243 type).

By G3IGK, 4 McBean Road, Wolverhampton. New 8028 kc/s (by Quartz Crystal Co., ¾ in. spacing).

G5CP, 12 Nottingham Drive, Wingerworth, Chesterfield. 12·020 and 12·0375 Mc/s (glass enclosed, gold mounted, for " Hamobile ").

Crystals Wanted

By G3BYO, as above, crystals between 8084 and 8100 kc/s (or 6 or 12 Mc/s crystals suitable for Zone 8).

By G3FXP, as above, crystals between 8061 and 8072 kc/s.

By G3IGK, as above, crystals for final frequency between 145·3 and 145·5 Mc/s.

By G5CP, as above, crystals between 8083 and 8100 kc/s (¾ in. spacing).

Portables and Mobiles

Members who require good coverage for their holiday expeditions should advise G2AIW of dates, locations and operating frequencies for publication in *Four Metres and Down*.

G5MA and G3DVV were worked. G3KBS/P was the first QSO with Worcestershire. G3CHW (Bristol), a newcomer to the band, was worked on April 15 for the first time. G6OX (Egham) is running a sked with GW8SU (Porthcawl) and is readable almost every night. GW3MFY has worked G6OX twice on c.w.

Cuba

CO2VY is active on 144·986 Mc/s with a power input of 500 watts to a 4CX-250B. Aerials at present in use are a 16-element beam and a 13-element long Yagi but a 32-element array is nearing completion. After working consistently into W4 for some time he is now turning his attention to Europe and would like to carry out tests with amateurs on the south coast of Ireland or England. CO2VY has already done quite a lot of scatter work and is on the band most days from 00.00 G.M.T. In addition to 144 Mc/s, he operates on 21, 28 and 50 Mc/s.

Seventy Centimetres

A.1566 (Bramhall, Cheshire) is moving to this band where some novel and complex receivers will be tried out. It is hoped that listening operations will be commenced at the end of May, and reports will be QSLd to the lucky operators. **G3HAZ** says 70cm continues as before in the Midlands area, but we should like to hear from some of the others also!

G3FEX (Storrington) is active on 435·7 Mc/s with a QQV03/20 tripler at 18 watts input and a Lecher line converter, partly to a design by G3EJL. Using a corner reflector only 16 ft. above ground G3FEX has heard seven stations with G3FAN as the best DX at 45 miles. G3FEX would be pleased to fix skeds for 70cm with anyone interested, and would be grateful for reports on his 70cm and 2m signals.

The G5DT Slot for " Seventy "

Widely used by many 70cm operators in the London area is a 7-over-7 slot beam aerial to a design by Clem Tucker (G5DT) of Wallington, who is well known as one of the pioneers of 435 Mc/s working in this country.

The slot itself is constructed of copper or brass tubing of $\frac{3}{16}$ in. outside diameter, with sides 12½ in. long and top

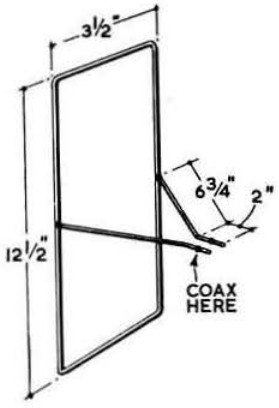


Fig. 1. Dimensions of G5DT's slot aerial for 435 Mc/s.

and bottom sections 3½ in. long. The matching section rods are 6¾ in. long converging upon one another and each ending in an extension 2 in. long. These 2 in. sections are parallel to one another and separated by ⅜ in. with the ends left open. The feeder is AS60M low loss co-axial supplied by J-Beam Aerials Ltd. The optimum tapping point for connecting the feeder to the 2 in. section is about half way down.

The dimensions and spacings of the parasitic elements, all of which are made from ⅛ in. o.d. rod or tubing are as follows:

Reflector 14 in. long, 7¼ in. behind the slot
Director 1, 11¼ in. long, 4¾ in. in front of the slot
Director 2, 11 in. long, 5 in. in front of the slot
Director 3, 10⅞ in. long, 5 in. in front of the slot
Director 4, 10¾ in. long, 5 in. in front of the slot
Director 5, 10½ in. long, 5¼ in. in front of the slot

G5DT recommends constructing the array on a pair of timber booms in preference to using metal. The whole is supported between the second and third directors.

This information was compiled by G5UM during the course of a contact with G5DT on 70cm.

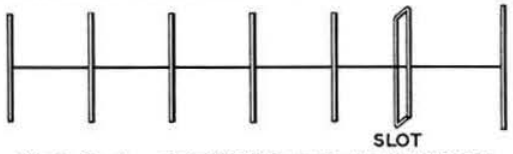


Fig. 2. One bay of the G5DT 7-over-7 array for 435 Mc/s.

Twenty-three Centimetres

Some interesting news of low-power work on 23cm comes from **G5DT** (Wallington) whose QRP signals have been heard by G3FP (Thornton Heath), G8AL (North Chingford), and G8RW (Bromley, Kent). Two-way phone contacts have been made with G3FP on 1297·45 Mc/s. The QRP rigs in use by these two stations are crystal controlled and deliver less than one watt to the aerials. The 23cm tripler-p.a. stages are driven by 70cm transmitters and comprise modified RF105 or RF105A units using either a CV53 or a CV82 in the final.

A tripler using a DET24, built by G3IRW, which gives an output of about 2 watts, was recently tested by G5DT. The DET24 requires about 7 mA grid drive (about 30 watts from a 70cm transmitter) to triple satisfactorily to 23cm. G3IRW is expected to be active on the band shortly.

G5DT, whose main crystal controlled transmitter is capable of 10 or more watts output to the aerial, also has an s.e.o. rig (4 watts output) covering 1250-1320 Mc/s with which he is prepared to put out signals for unlimited periods for the benefit of those testing receivers.

Four Metres

G5MR says the auroral condition was evident on this band on March 27, F8NB and F9CZ being heard by this means. F9CZ, the more distant (205 miles) and the weaker by direct propagation, was the stronger by aurora whilst F8GH who was S9 direct could not be heard at all by aurora. As these stations did not appear to be listening in the G band, no contacts were made. April opened extremely well, and for the first six days, F8GH was never less than S9+. During this period F3XY (40m east of Paris) was worked and F2RL (nr. Evreux) and F9LD (Roubaix) were heard, all for the first time on the band. First QSOs were made with G2DD (Stanmore, Middx.) and G3EMU (Canterbury). On April 1 and 2, between 12.00/14.30 G.M.T. there was some evidence of ionospheric propagation on 4m. A commercial station with a rough note, was heard coming in from the south, and signing HXZ 21/26 (French and French Colonial allocations). The frequency was apparently 72·225 Mc/s but may have been a harmonic. A strong carrier (also rough) was heard on an adjacent frequency but the modulation was unintelligible. G5MR asks us to try and stir up some enthusiasm for the 4m contests on June 20/21. Well, what about it? Will all who can, please rally round? Remember, there may be ionospheric DX also!

Reports for the June issue by May 18, please. Good hunting.

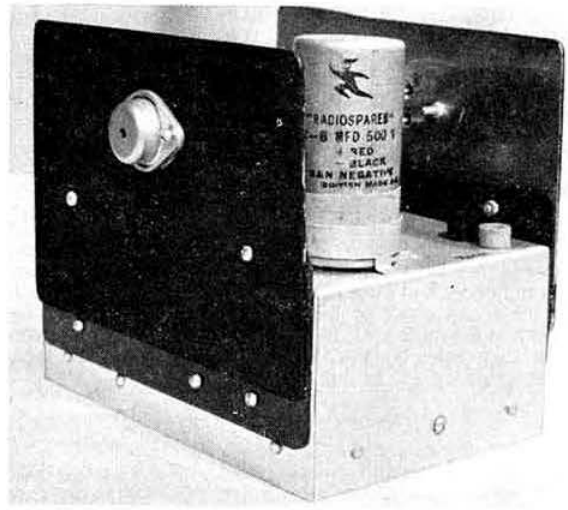
Mobile Column

By JOHN A. ROUSE (G2AHL/M)

FOR most mobile installations, the car battery is the heart of the station and the efficient use of the energy it provides is the foundation of satisfactory operation. The current that can be drawn is not unlimited and it is therefore essential to employ the available power to the best advantage. While careful selection of valves with low heater current requirements is one way of keeping the overall drain within reasonable bounds, the provision of h.t. is still a problem, particularly when it is remembered that a vibrator pack is seldom more than 70 per cent efficient while rotary converters are even worse, typical figures being 35–50 per cent. A situation in which 20 watts or more input to the h.t. unit is required for an *input* of only 10 watts to the anode of the p.a. valve in a transmitter is not far fetched. On the other hand, a reasonably good transistorized power supply would require an input of only about 12 watts—a very worthwhile improvement.

Until quite recently, transformers suitable for use in transistorized amateur mobile h.t. supplies have not been easily obtainable but now that a type likely to meet the requirements of the average mobile station is available members may be interested in the details of such a unit. The circuit is shown in Fig. 1.

The two biasing resistors R1 and R2 determine (i) the voltage output of the unit, and (ii) the ease or otherwise with which the circuit will commence to oscillate under load. With the transformer suggested, maximum output will be about 300 volts at 130 mA—nearly 40 watts. To obtain this output R1 should be of the order of 50 ohms. The value of R2 is best found by experiment and it is suggested that a 10 ohm variable resistor should be used initially to find the value which provides maximum output compatible with easy starting under load. When testing is complete, an appropriate value of fixed resistance can be used for R2. Due to the varying characteristics of the transistors which may be used, it is impossible to be more specific. If the maximum possible output is not required, R1 and R2 can be increased in value to give the required voltage. The capacitor across R1 is intended to limit the transient "spikes" and should be a new and tested component of known reliability.



This picture shows the prototype of the transistorized power supply built by G2BVN. One of the transistors mounted on its heat sink is visible.

The rectifiers D1, D2, D3 and D4 may be either selenium units or silicon diodes. If the former are used, half-wave types with ratings of about 200 volts at 100 mA will be adequate. Silicon diodes should have p.i.v. ratings of about 600 volts although 400 volt types may be used if the transformer output voltage is reduced slightly. If silicon diodes are used it is advisable to connect 33 ohm resistors in each of the secondary leads from the transformer in order to reduce the switch-on peaks.

A 5 amp. fuse should be used in the negative d.c. input lead during the initial tests and while adjustments are being carried out but should be short circuited for normal operation, because it has been found that the resistance of a fuse is sufficient to cause a considerable drop in the output voltage. For the same reason, the relay must have large contacts and heavy leads must be used for the connection to the car battery. Similarly, the braid from scrap coaxial cable, enclosed in sleeving, has been found most satisfactory for wiring the primary circuit of the unit.

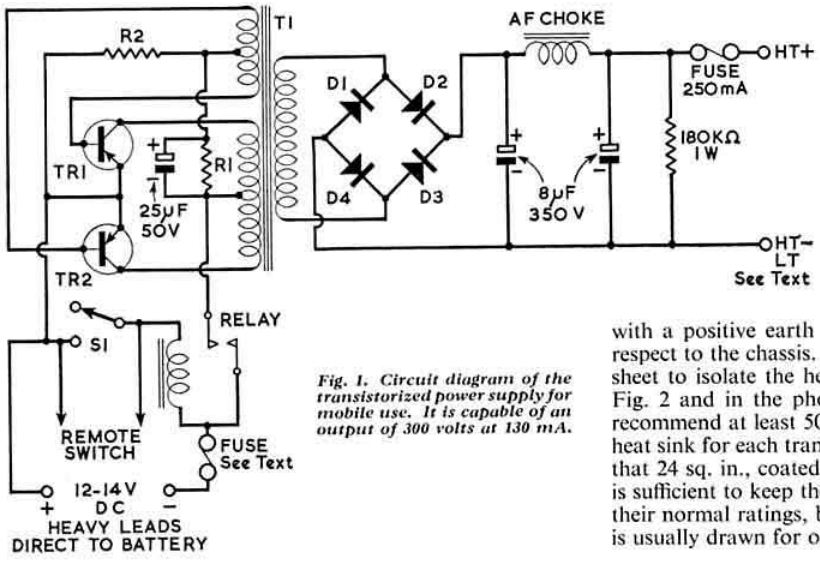


Fig. 1. Circuit diagram of the transistorized power supply for mobile use. It is capable of an output of 300 volts at 130 mA.

Construction

The mechanical construction is largely determined by the fact that the transistors require heat sinks which, in a car with a positive earth system, are at 12 volts negative with respect to the chassis. A form of construction using paxolin sheet to isolate the heat sinks from the chassis is shown in Fig. 2 and in the photograph. The manufacturers usually recommend at least 50 sq. in. of 16 s.w.g. aluminium for the heat sink for each transistor but in practice it has been found that 24 sq. in., coated on the outside with matt black paint, is sufficient to keep the temperature of the transistors within their normal ratings, bearing in mind that maximum output is usually drawn for only short periods. Using silicon diode

rectifiers it is possible to build the complete unit on a chassis measuring 6 × 4 × 2½ in. Selenium rectifiers would require somewhat more space.

The transistors used in the prototype were the T.K.D. " black " spot type, obtainable inexpensively from Proops Bros. The transformer available from the Minimitter Co. Ltd.

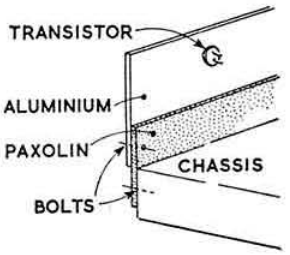


Fig. 2. Method of insulating the heat sinks from the chassis.

normally works at an oscillation frequency of about 100 c/s, the efficiency at maximum output being approximately 85 per cent. The primary current drawn does not vary directly with the secondary load and a large reduction in the secondary current does not reduce the input in proportion.

One final point: a transistorized power supply should not be placed near to a source of heat and should not therefore be mounted under the bonnet of a car.

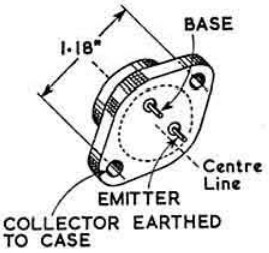


Fig. 3. Base diagram of the T.K.D. " black " spot power transistors.

Out and About

G6DN (Manchester) uses a 5 watt rig in his Ford Anglia de Luxe (Reg. No. UND44) and has had excellent results on Top Band, 7 and 14 Mc/s. On 7 Mc/s contacts have been made with stations all over the United Kingdom while 14 Mc/s has brought phone QSOs with LA, SM, UA, DL, PA, ON4, F, EA, I and YU. The transmitter comprises a 6C4 oscillator, 12AU7 f.d. and 6BW6 p.a., modulated by another 6BW6 driven by a 12AT7. A Top Band Command receiver is used for reception with converters for 7 and 14 Mc/s. The aerial is a 5 ft. centre-loaded whip mounted on the rear bumper.

G3DO (Sutton Coldfield) uses a Hamobile in his car (Reg. No. NGP881) for 144 Mc/s and a ZC1 Mk. II for Top Band. A dipole and a four-element Yagi are the aerials for 144 Mc/s while a whip is used on 1·8 Mc/s.

B.R.S. 18741 (Bacup, Lancs), another listener-mobile, uses an Ekco Model CR61 receiver in his Ford Zodiac for reception on 3·5 and 7 Mc/s.

Amateur Radio Mobile Society

One of the most interesting developments on the organizational side of amateur mobile work has been the recent formation of the Amateur Radio Mobile Society. A point worthy of note is that members of this society undertake to ensure that their stations are operated not only in accordance with the terms of the amateur licence, but that *they shall be so constructed, installed and used that they do not in any way constitute a hazard to the operators or to any other persons.*

The Chairman of A.R.M.S. is Rowley Shears (G8KW). Details of membership may be obtained from the Hon. Secretary, G. E. Storey (G3HTC), 10 Avon Road, Sunbury-on-Thames, Middlesex. The society's first public event will be a rally at Maldon, Essex, on July 5.

North Midlands Mobile Rally

The mobile rally organized by the Stoke-on-Trent Amateur Radio Society and the Midland Amateur Radio Society at Trentham Gardens, Staffordshire, on April 26 was a tremendous success, with an attendance of between 750 and 1,000. More than 190 mobiles were counted in the four car parks at one period. The Gardens themselves provide excellent facilities for an event of this nature but the organizers had wisely laid on a number of indoor attractions including model control and amateur television.

" Technical Topics "

THE article on high power transistorized d.c. converters referred to in *Technical Topics* in the April issue of the BULLETIN was published in the March 1959 issue of *Electronic and Radio Engineer* and not in the issue stated.

NORTHERN MOBILE RALLY

Harewood House, near Harrogate

(By kind permission of H.R.H. The Princess Royal and the Earl and Countess of Harewood).

Sunday, May 24, 1959

Harewood House is situated on the A61 road, 7 miles from Harrogate and 8 miles from Leeds. The Park will be open from 12.30 to 6 p.m. " All-in " tickets for adults 3/-, children half-price. Attractions will include the Bi-centenary Exhibition "The Story of Harewood". Rally stations will be in operation on 1·8 and 3·5 Mc/s. Refreshments, including cold luncheons and high teas, may be obtained at nominal prices.

Further details may be obtained from J. J. Rose, 14 South View Terrace, Hill Head, Dewsbury, Yorkshire.

Organized by the Spen Valley Radio Club.

LONGLEAT MOBILE RALLY

Longleat House, near Warminster, Wiltshire

Sunday, June 14, 1959

Grounds open from 10 a.m. to 6 p.m. Entrance fee, 1/- per person.

Reserved Rally car park. Adequate catering attached to the house for those not wishing to bring their own picnic lunch and/or tea. Morris Dancing by the Wiltshire Group of the English Folk Dance and Song Society at 3 p.m. and 5.30 p.m.

Prizes will be awarded to (*a*) the mobile travelling the greatest distance *to and from* home on the *day* of the Rally; (*b*) for the longest distance mobile-to-control contacts on 2m and Top Band before 14.00 B.S.T. (prizes for each band). The awards will be presented by Lord Bath.

RALLY STATIONS

G3CHW/A on 1900 kc/s (tuning the whole band for replies—mobiles are asked to keep off this frequency).
G3FKO/A on 145·3 Mc/s.

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

R.A.E.N. Notes and News

BY E. ARNOLD MATTHEWS (G3FZW)*

ACTIVITY is again increasing, with many groups planning their summer programmes. **Cheshire** for instance, are hoping to conduct some local exercises before N.F.D. in order to check their efficiency. The Northwich A.C., G3GYV, is conducting tests to ascertain ranges obtainable from mobiles in his area, whilst the county net under G3ERB, which is held every Sunday morning at 10.00, on 1900 kc/s brings in stations from a wide area. The C.C. says that R.A.E.N. members from other areas will be welcomed into the net.

Staffordshire Group turned out in some strength to take part in Exercise "Triad" on April 19. This exercise, undertaken at the request of the Ministry of Health to test the ability of the reserve services to cope with a sudden rush of a large number of casualties, took place in the northern suburbs of Wolverhampton. R.A.E.N. was called in by Staffordshire Branch B.R.C.S. to assist them in their part of the exercise. Some idea of the magnitude of "Triad" will be gained by the fact that no less than 1,000 persons participated in it and over 750 "casualties" (horribly realistically made up by the "Casualties Union") were treated by the medical teams. R.A.E.N. was originally called upon to set up stations at the Royal Hospital, Wolverhampton and at the site of the exercise, with a third (mobile) station in reserve. In the event, however, four portable and five mobile stations attended, which was all to the good as it was not long before a mobile station was in operation in a static role on the far side of the exercise site, whilst a mobile at the hospital was also used to good effect. Despite a high noise level communications were well maintained and traffic was heavy at times. Lunch was provided by the W.V.S. The C.C., G3DML, was supported in his efforts by A.C.s G3MDF, G2HNA and G3UD, and members G3ESW, G3HOP, G3JZB, G3KNH, G3JAZ and G2HKS. Much assistance was also received from the **Salop** A.C. (G3JPB), Miss Wood and Mr. Bryan.

Suffolk, London and **Essex** groups held an officers' meeting on April 5 when a number of administrative and operational matters were discussed. The groups have exchanged lists of mobile and portable stations available. It was agreed to arrange a three-county exercise during the summer. A further meeting is to be held in Ipswich, and will include officers of Norfolk Group. The **West Essex** A.C. (G2BCX) has issued an extremely well produced directory of members which gives a considerable amount of information about the group membership.

The **Norfolk** group gave a demonstration exercise to about 70 St.J.A.B. members at Fakenham on April 12. St.J.A.B officers originated the messages. G4KO/A acted as control station in the lecture hall and G3KAY, G2HCA, G3HRK/M, G3JPT and G3IWC were out-stations. Among the observers were G3SZ (A.C., Kings Lynn) and his deputy, G3HRX, PA0LJG and two listener members. The demonstration was preceded by a lecture given by Norwich A.C., G3LFU. G3HRK reports that Norfolk St.J.A.B. have suggested that R.A.E.N. personnel would be more easily identified if they wore a distinctive armband.

The newly-appointed A.C.s for Oxford (G3JLE) and North Surrey (G3VK) will be able to proceed with the formation of groups with the encouragement of their local affiliated societies. Cheshire C.C., G3ERB, is to address Flintshire A.R.S. on May 4, and Aberdeen A.R.S. is considering the formation of a group. G2TG, who is A.C. for **Sunderland**, was a B.R.C.S. Divisional Commandant, and so should have an extremely clear idea of the possibilities of a group to be formed in the area. G6NU, **Kent** C.C., is taking stock of the group and wishes to extend its area of activities. A batch of registration forms from **Torquay** indicates that the new group there is settling down well.

Members in the **North Wales Coast** area who would be interested in assisting the B.R.C.S. cadet division are asked to contact Mrs. Grinsell, 21 Cynfran Road, Llysfaen, Colwyn Bay.

Personnel

The following have been appointed Area Controllers: W. Stockburn (G2TG), 40 Netherburn Road, Sunderland; R. Pearce-Boby (G3JLE), c/o, The City Architect, Town Hall, Oxford; J. D. Kingston (G3VK), 51 High Drive, New Malden, Surrey; D. Boddey (G3KUM), 1 Kingsgate Drive, Ipswich.

F. Pierson (G3HSG) and L. E. Flint (G3DMN) have resigned from the offices of Area Controller for Watton and Ipswich, respectively.

* *1 Shortbutts Lane, Lichfield, Staffs.*

STAFF VACANCY

THERE exists at Headquarters a vacancy for a qualified shorthand typist or for an experienced copy typist. Salary according to age, qualifications and experience. Office hours 9.15 a.m. to 5.15 p.m., Mondays to Fridays. Luncheon vouchers. One week's holiday with pay after six months; two weeks with pay after twelve months' service.

Applications in the candidate's own handwriting should be addressed to the General Secretary and marked "Staff Vacancy".

G3AAZ RETRIEVES THE CUP

When the Welwyn Garden City Group held their annual Constructors' Exhibition the "Stanley Harrison Trophy" was won for the third time by Gerald Gibbs (G3AAZ) for a miniaturized 2m converter and crystal control local oscillator each on a separate chassis. They can be seen on the table in front of him in this picture. Last year's winner, Reg Wade (G3IRW) secured second place with a 70cm converter. Judging was done by former Council Member Dick Walker, G6QI (left) and present Council Member Douglas Kay (G3AAE) third from left, with G3AAZ between them. On the right is Mr. Stanley Harrison, J.P., the donor of the "G3EPK Trophy."

Society News

Bulletin Deliveries

ON a number of occasions recently members have complained to Headquarters about the uneven distribution of the BULLETIN. In an effort to discover the cause a meeting took place last month between the Head Postmaster, Hitchin-Letchworth, the Postmaster, Letchworth, the Production Manager, Loxley Bros. Ltd. (printers of the BULLETIN) and the Editor.

It was admitted during the meeting that not all copies of the March issue were cleared by Letchworth Post Office on Friday, March 13, due to the fact that some copies were received from the printers late in the afternoon of that day. Because of restricted Saturday working in the Post Office some of these copies were not cleared from Letchworth Post Office until Monday, March 16. This explains why copies of the March issue were received by some members on Saturday, March 14, whilst other copies were not received until Tuesday, March 17 or Wednesday, March 18. To avoid a repetition of this trouble Loxley Bros. Ltd. will, in future, arrange for all copies to be ready for collection by the Post Office by a time that will ensure that they are all cleared from the Letchworth Post Office that day.

Loxley Bros. Ltd. have agreed to send the Society a certificate to confirm that all copies of a particular issue were cleared on a stated day, and the Post Office have agreed to endorse the certificate.

It was stated at the meeting that up to 48 hours can elapse from the time a particular copy of the BULLETIN leaves Letchworth Post Office until it is delivered at a remote part of the U.K. mainland, but normally copies should be received by the second delivery of the day after posting.

The Post Office representatives agreed that it would be technically possible to postmark each copy of the BULLETIN after it has been wrapped, but the process would slow up the final delivery by about one day. The open frank system, now in use, is not popular with the Post Office but is the only one that can be employed (other than normal hand-stamping after the BULLETIN has been wrapped) unless Loxley Bros. Ltd. can guarantee, well in advance, that all copies of a particular issue will be ready for collection on the day shown on the dated pre-franked wrapper.

In order to enable the Hitchin-Letchworth Head Postmaster to investigate any future complaints of uneven distribution, members are asked to report the facts promptly to Headquarters. The wrapper should be returned with a note stating the actual time and date the copy in question was delivered.

Region 9 Representative Resigns

MR. W. J. GREEN (G3FBA) of Bath, who has been Region 9 Representative for the past few years, has notified the Council that he wishes to resign from that office with effect from June 1, 1959. Mr. Green's resignation has become necessary because he is now working in London and will shortly be moving into the London Region.

Nominations for his successor (who must be a Corporate Member resident in Region 9) must be signed by five Corporate Members resident in the Region and must reach the General Secretary not later than June 30, 1959. If more than one person is nominated for the vacancy a ballot will take place, details of which will be published in the July issue of the BULLETIN.

Region 9 comprises the counties of Bristol, Cornwall, Devon, Dorset and Somerset.

Unlicensed Operation

A 22-years-old student (Graham A. King) who operated an unlicensed radio station from 22 Summer Gardens, East Molesey, Surrey, was stated at Kingston County Magistrates Court on April 6, 1959, to have endangered shipping frequencies by his broadcasts. King pleaded guilty to using a radio transmitter without a licence and was fined £20 with £5 5s. costs.

During the hearing of the case, Mr. G. A. Bird (a Post Office official) said that anyone using a frequency, as King had been, which was below 1500 kc/s was a danger to shipping. Although no specific complaints had been made in this case by shipping there was considerable risk involved, especially when the transmitter was used by an inexperienced person. He went on to say, according to a report in the *Surrey Comet*, that "a great deal of money had been lost by shipping companies in the past through amateurs sending signals on shipping frequencies." (In view of the seriousness of the allegation reported to have been made by Mr. Bird (who we understand is a licensed amateur) the Radio Services Dept. of the Post Office has been asked to provide the Society with evidence that amateurs have been sending signals on shipping frequencies and that as a consequence money has been lost to shipping companies.—EDITOR.)

I.A.R.U. Calendar

THE *Calendar* of the International Amateur Radio Union for December 1958 reports that with the admission of two new societies, Polski Zwiazek Krotkofalowcow and the Amateur Radio Society of India, membership now totals 54. The *Calendar* also reports briefly on the Region I I.A.R.U. Conference held in Bad Godesberg, Germany, from July 21-25, 1958.

The number of W.A.C. certificates issued during 1958 was a record. Of the total of 2,425, 998 were for phone, 100 were endorsed for single sideband, 16 were for 50 Mc/s work and six were for 3·5 Mc/s achievements.

Tape Recorded Lectures

MEMBERS are advised that no bookings for the Society's tape-recorded lectures can be accepted during the month of June as the Honorary Curator (Mr. F. Lawrence, G2LW) will be absent from London.

GB2RS SCHEDULE

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

Frequency	G.M.T.	Location of Station
3600 kc/s	10.00	London
	12.00	Yorkshire
145·55 Mc/s	11.15	Beaming south-east from Leeds
	11.30	Beaming south-west from Leeds
	11.45	Beaming north from Leeds
145·3—145·4 Mc/s	12.00	Beaming north from London area
	12.15	Beaming west from London area

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 16, 1959, at 6 p.m.

Present: The President (Dr. R. L. Smith-Rose in the Chair), Messrs. H. A. Bartlett, N. Caws, C. H. L. Edwards, K. E. S. Ellis, D. A. Findlay, W. J. Green, J. H. Hum, E. G. Ingram, J. D. Kay, A. O. Milne, L. E. Newnham, W. A. Scarr, A. C. Williams, E. W. Yeomanson (Members of the Council), John Clarricoats (General Secretary) and John A. Rouse (Deputy General Secretary).

Apology for Absence: The Secretary submitted an apology for the absence of Mr. W. R. Metcalfe.

Absent: Mr. H. W. Mitchell.

* * *

Membership

Resolved (i) to elect 70 Corporate Members and 33 Associates; (ii) to grant Corporate membership to two Associates who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to A.E.R.E. Amateur Radio Club, Manchester University Amateur Radio Society, and Springfield Boys' Club Radio Section.

National Convention 1960

It was reported that the Cambridge group would shortly be giving preliminary consideration to the question of organizing a National Convention in that city during the autumn of 1960.

The London Short Wave Club

Consideration was given to a request from The London Short Wave Club for the Society (*a*) to take space at an Exhibition to be held in the Festival Gardens, Battersea Park, London, on the occasion of a Mobile Rally on September 6, 1959, (*b*) to reserve space in the Exhibition-Rally programme.

Resolved to take no action on the requests.

It was agreed to point out to the organizers that the date fixed for the Rally will be the day after the National Radio Show has ended and that as a consequence many London members with Exhibition experience will be engaged on dismantling and clearing up the Society's stand at Earls Court.

"Bulletin" Deliveries

It was reported that some copies of the February issue of the R.S.G.B. BULLETIN did not reach Bristol until the 22nd of that month.

Resolved that an approach be made to the appropriate department of the Post Office inviting a responsible officer to call at Headquarters to discuss the general question of BULLETIN postings and deliveries.

Reports of Committees

The Minutes of Meetings of the Finance and Staff, Technical and TVI/BCI Committees were submitted as Reports.

Resolved to receive the Reports and to adopt certain of the recommendations contained therein.

The meeting terminated at 9.40 p.m.

National Field Day

FOR the benefit of groups and clubs taking part in N.F.D., the Medway Amateur Receiving and Transmitting Society has produced a "food preparation time sheet." Copies may be obtained from the Hon. Secretary, G. A. Gascoigne (G3LCC), 78 Valley View Road, Rochester, Kent. A s.a.e. should be enclosed with inquiries.

* * *

The Editor will be pleased to consider for publication action pictures and unusual shots taken during National Field Day.

Silent Key

W. O. JACKSON (G3MWJ)

We regret to report the death, on April 1, 1959, of W. O. (Bill) Jackson, G3MWJ, at the age of 54. Although he did not become interested in Amateur Radio until he retired due to ill-health, Bill Jackson studied hard for the R.A.E. and the Morse Test but on the day his licence arrived he went into hospital. It was not until after Christmas 1958 that he finally made his first contact. However, after completing only one page of his log book illness prevented his continuing to operate his station.

Always cheerful and willing to help others he will long be missed by the Southampton Group. To his widow and family we extend our sympathies in their sad loss.—G.A.A.

Silent Keys

J. W. KYLE, D.F.M., A.F.M., B.E.M. (GM6WL)

"Jock" Kyle's death on April 15, 1959, came as a shock to v.h.f. enthusiasts everywhere and in particular in his native Scotland where he occupied an unique position. He was the pioneer in v.h.f. work in Scotland starting in the late 1920's on 5m. It is no exaggeration to say that a great deal of the v.h.f. work in that country owes much to the example which he set and to the encouragement and advice which he so freely gave. His interest in Amateur Radio dated back to the early days of the movement and this interest never flagged right to the last.

During the 1939-45 War, in which he served with distinction in the R.A.F., he was awarded the D.F.M. and A.F.M. Oftimes Jock flew on missions when of an age well beyond that normally allowed to anyone undertaking such duties. After the war he joined the Ministry of Civil Aviation and was awarded the B.E.M. some years ago for devotion to duty.

Such was the esteem in which he was held that every available member of the West of Scotland V.H.F. Group as well as representatives from other groups were present at the funeral service which was conducted by the Rev. Walter Ferrier (GM3BDA).

Sincere sympathies are extended to his sisters who were well known to many who attended meetings of the local v.h.f. group.
—J.H.

Jock Kyle (GM6WL)
An Appreciation

The name of Jock Kyle will always be remembered when amateurs gather to discuss radio. I was in my garden on a sunny afternoon when news reached me of his untimely passing. It is hard to believe that this lovable Scot is no more. Only a few weeks ago at the Scottish V.H.F. Convention many tributes were paid to his fortitude in his illness and the hope expressed of a speedy recovery. God, however, has willed it otherwise, and another light of Amateur Radio has been extinguished.

Jock was a man of sterling worth. He was endowed with great technical ability, and readily helped those who sought his advice and help. He gave generously of his time to further the v.h.f. art, and it is due to his inspiration and enthusiasm that the v.h.f. bands are so popular in Scotland today.

Possessed of many noble qualities, and an unassuming personality he carried the virtues of simplicity and sincerity to a lofty eminence. All contacts with him, both personal and on the air, were distinguished by the admirable qualities that flow from a man who loved his fellow men. A great amateur and a grand gentleman has passed on.—EI2W.

D. A. MACQUEEN (GM4PW)

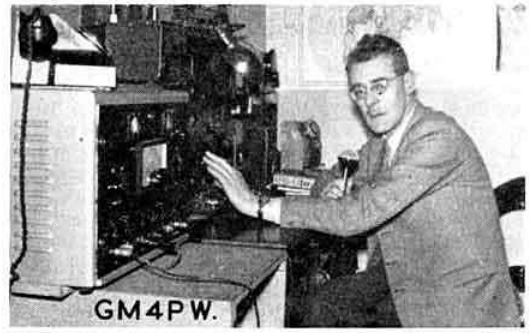
It is with deep sorrow and much regret that we report the death suddenly in his car on Sunday, April 4, 1959, of Mr. Dugald Alastair MacQueen (GM4PW) of Prestwick, Ayrshire, Scotland.

Mac, who was in his 50th year, was a pioneer of Amateur Radio in South-Western Scotland and he was at the time of his death R.S.G.B. County Representative for Ayrshire. He was first licensed in 1935 at a time when there were few other licensed amateurs in that part of Scotland.

His technical knowledge, which he imparted willingly to all who sought his help, enabled the local group to become prominent in skill. He was always anxious to help the newcomer. In addition to his interests in Amateur Radio Mr. MacQueen was a prominent Freemason, having held high office in local lodges. He was also a keen motorist and an enthusiastic archer.

Mr. Hugh McConnell (GM2ACQ) represented R.S.G.B. Headquarters at the funeral which was attended by a large number of amateurs from places as far north as Lanarkshire and as far south as Staffordshire.

Condolences are offered to Mrs. MacQueen and to her son in their great loss.—H. McC.



"Mac" at the controls of his station, one of the best known in the whole of Scotland.

Blackpool Brought the Numbers

AT least one member of the Headquarters party took the opportunity of a seaside walk before breakfast on Sunday, April 12. The sun did indeed favour those who were up and about early that day to put the finishing touches to the arrangements for the Region 1 O.R.M. By midday the roads to Blackpool were suffering from heavy QRM, for by lunchtime over 100 members and their wives had arrived at the Imperial Hotel.

While at the luncheon table the Regional Representative proposed a toast to the Society and at the same time welcomed members of Council and other distinguished guests—including Mr. Y. W. P. Evans (G2YO) of Blackpool (with 37 years of membership to his credit), Philip Wade (G2BPJ) who that week had been elected to the Council as Zone A Representative, and John Petty (G4JW) of Sheffield, Region 2 Representative. The General Secretary responded to the toast and appeared in great fettle—despite his ascent (and descent) of Blackpool Tower on the previous day.

Then followed briefly a presentation of trophies and a little later the business meeting. G6CL opened the session on the theme of International Amateur Radio. It was interesting to hear from him about the background to Atlantic City and International Radio Conferences generally. The other members of the Council delegation, Douglas Kay (G3AAE) and Bill Green (G3FBA) also spoke on matters in which they had particular interest—the former on DX and about the difficulties of compiling *The Month on the Air* which he has just taken over, and the latter about the assistance that individual members can give in the running of QSL bureaux. In the general discussion that followed not the least interesting topics were Top Band Interference and "Pirates."

A picture taken outside the Imperial Hotel, Blackpool, on April 12, 1959.

A very excellent tea was followed by photographs taken in the hotel courtyard and then the raffle. It was soon apparent that the R.R.'s one-time traditional luck had returned but the pleasure that this gave seemed by no means unanimous.

During the evening a film show (producer and director—Ron Cumberlidge, G3CK) featured the Wirral Group in their National Field Day activities, and later Bob Taylor, who is a member of the Magic Circle and one-time holder of the call VS7HT, mystified the audience with his "Magic with a Difference." (Have you ever seen the Indian Rope Trick done with co-ax?) Some of his magic appeared impossible to the uninitiated!

The weekend story would not be complete without mention of the happy party on Saturday evening given for the visitors by the Blackpool Group at the Howard Hotel owned by Lou Beevers (G3JLF).

Congratulations are due to Jim Newland (G5ND)—the Blackpool T.R., his helpers in the Blackpool and Fylde Amateur Radio Society and to the Imperial Hotel for the very excellent fare that they provided. The 1959 Blackpool O.R.M. will be remembered for a long time to come.

—G2AMV.

London Members' Luncheon Club

OLD TIMER and DX enthusiast Allan Hutchings (VK3HL) of Callawadda, Victoria, was among the several overseas guests present at the gathering of the London Members' Luncheon Club at the Bedford Corner Hotel, Tottenham Court Road, on April 17, 1959. Allan, who is on a world tour with his wife, Lilla, has been an R.S.G.B. member for more than 25 years. During his stay in England he expects to meet many of those who have worked his station in the past.

Also present at the luncheon were Jim Olsson (K2GVQ) and his wife, "Tommy" (K2HWX), who are beginning a three-year spell of duty at R.A.F. Station, Croughton. Their home is in Rome, New York.

Making his third visit to the Club was David Marks (W2APF), known the world over as "Uncle Dave" of Fort Orange Radio Distributing Co. Inc., Albany, New York. Also warmly welcomed were Don Keplinger (K4JKP) and A. C. Whitehill (G3IRK, ex-ZC4IK) recently home from Cyprus.

The chair was taken by Stanley Vanstone (G2AYC) who had the support of about 30 regular members including several ladies.

The Club will meet again on May 15 and on June 19. Reservations to HOLborn 7373 or Ruislip 2763 not later than May 14 and June 18 respectively.

New Sideband Handbook

NEW Sideband Handbook, published by Cowan Publishing Corporation, New York, and written by Don Stoner (W6TNS) is a volume of 232 pages, containing entirely different material from the earlier handbook published by *CQ* Magazine. The eight chapters deal, in an easy style, with all aspects of sideband operation, covering transmitting and receiving techniques and also double sideband suppressed carrier operation.

The G2MA linear amplifier is one of the several circuits described in the relevant chapter. A feature of the section dealing with reception of s.s.b. signals is a number of extracts from circuits of current U.S. receivers. Several commercial transmitters receive detailed attention, and full information is given on the Heathkit S.S.B. adapter, the Multiphase 10B exciter and the Globe D.S.B.100 transmitter. Alignment and adjustment are fully covered in the various sections.

The book can be recommended as a valuable addition to an s.s.b. library. The price, from the R.S.G.B. Bookshop, is 25/- post paid.

Tests and Contests

144 Mc/s C.W. Contest 1959

SUPPORT for the first c.w.-only 144 Mc/s contest (held on January 24, 1959) was good, 29 entries and two check logs being received from members in England, Scotland and Wales. Though this number was considerably lower than in other 144 Mc/s contests, the Contests Committee feels well satisfied, bearing in mind that winter time v.h.f. contests have been decried in the past.

Conditions were described as fair to good though one or two entrants considered them " rock bottom." Activity was generally stated to be low by usual contests' standards though G5MR said it was high! Opinion was divided as to the wisdom of holding the event on a Saturday and the Committee will give careful thought to this point before the rules for the next contest are decided. By no means all entrants approved of a c.w.-only event but the Committee considers that the support justifies its decision to arrange such a contest as a result of requests made by v.h.f. enthusiasts. However, it was a little disappointing to find that not all of those who had joined in asking for the contest actually took part. The logs received were well presented and scoring was generally accurate. On one point most of those who commented were united: the " one point per kilometre " rule was not liked.

The winner of the High Power Section was G5YV with a score of 7,356 points, followed by G3FZL (5,482 points) and G8MW (4,997 points). G5YV, who used 90 watts to a QQV06-40 and a 4-over-4 Yagi 70 ft. above ground, also made the longest distance contact by working PA0LO at 435 km.

Leader of the Low Power Section was G3CCH (3,608 points) whose last contact was with GI5AJ at 360 km—the second longest distance QSO in the contest. Second was G3AYC (B.B.C. Ariel Radio Club, Langham) with 3,336 points followed by G6OX with 2,620 points. G3CCH's transmitter ran 30 watts input to an 829B feeding four 5-over-5 slot fed Yagis (40 elements in all).

Check logs from G2QY and G3CO are gratefully acknowledged.

HIGH POWER SECTION

Posn.	Call-sign	Points	Posn.	Call-sign	Points
1.	G5YV	7356	9.	G5DW	1845
2.	G3FZL	5482	10.	G5MR	1523
3.	G8MW	4997	11.	GW8UH	1251
4.	G3HBW	4338	12.	G2JF	1250
5.	G3GKH	3918	13.	G5JU	1116
6.	G5MA	3763	14.	G2AIW	1100
7.	G2XV	3686	15.	G3HRH	693
8.	G6LI	1905			

LOW POWER SECTION

Posn.	Call-sign	Points	Posn.	Call-sign	Points
1.	G3CCH	3608	8.	G3KPT	1263
2.	G3AYC	3336	9.	G3FD	1217
3.	G6OX	2620	10.	G3JR	952
4.	G5UM	2105	11.	G2RD	942
5.	G3IBI	1615	12.	GM3HLH/A	804
6.	GW3MFY	1550	13.	G3NCA	446
7.	G3MEV	1274	14.	G3HBR	203

First 1·8 Mc/s Contest 1959

ONCE again the same group of Top Band contest enthusiasts were the leaders in the event held on February 21-22, 1959. There was in fact a very close finish between four competitors, three of whom were the joint winners of the Second 1·8 Mc/s Contest 1958 held in November. W. H. Wells (G3HVX), with 141 points, just managed to secure first place from H. J. M. Box (G6BQ) and W. R. Steverson (G3JEQ), both with 139 points, closely followed by I. T. Cashmore (G3BMY), with 138 points.

The three leading stations made 133 contacts each, including QSOs with DL and OK while G6BQ worked ZC4IP. No contacts with U.S. stations were reported. GM6IZ had probably the longest distance QSO—with ZC4IP; incidentally only three entrants were worked by the latter.

Conditions were reasonably good and activity was stated to be high but fewer stations submitted entries than on previous occasions. The times of commencing and ending the contest and its duration appeared to meet with general approval though a few entrants prefer longer and later starting events. All the views expressed, including one or two suggestions for different scoring systems, will be considered before the rules for the next event are drawn up.

Posn.	Call-sign	Score	Posn.	Call-sign	Score
1	G3HVX	141	31	G3HDZ	71
2	G3JEQ	139		G3MCD	71
	G6BQ	139	33	G3HQT	70
4	G3BMY	138	34	G3KOR	68
5	G3KLH	134		G6UT	68
6	G3ERN	126	36	G3KDV	67
	G5LR	126	37	G4CM	65
8	G3KEU	121	38	G2XP	64
9	G3IIS	99		G3IRL	64
10	G3KRC	98	40	G5VU	62
11	G2KK	95		G6HD	62
12	G3IAS	94	*	G3NFV	59
	G3MEH	94	42	G5JL	58
14	G2ZZ	93	43	G2DHV	55
	G2AFV	93	44	G3LEV	50
16	G5YN	87	45	G3JWB	46
	GM3KHH	87	46	GM6IZ	43
18	G2FHF	86	47	G3HIW	42
	G2HPF	86		G3LPT	42
20	G3JVR	81	49	G3KUG	40
21	G3CWW	80	50	G3KPU	39
	G3JKY	80	51	G3MGL	38
23	G3IBL	77		G8KU	38
	G3JII	77	53	G3MCO	37
25	G3DCZ	76	54	G3LUI	33
	G3LHJ	76	55	G3AWO	30
	G3LVP	76	56	G3FVW	27
28	G3HES	75	57	G3MZB	26
29	G3KVG	74	58	GI2DZG	21
30	G3LCH	73		* Late Entry.	

A total of 17 check logs, which are gratefully acknowledged by the Contests Committee, was received from DL1YA, G2MI, G3EIO, G3GCD, G3JFD, G3KAB, G3KGU, G3KPJ, G3LPY, G4IV, G4VF, G5AO, G6ZT, OK1AEH, OK1AMS, OK2NR and OK3EE.

Contests Diary

1959

May 24	**- D/F Qualifying Event (South Manchester)** ‖
May 24	**- 420 Mc/s Contest** ‖
June 6-7	**- National Field Day‡**
June 20-21	**- First 70 Mc/s Contest***
June 28	**- D/F Qualifying Event (High Wycombe)***
July 5	- Second 144 Mc/s Field Day†*
July 12	- D/F Qualifying Event (Slade Radio)
September 5-6	- National V.H.F. Contest and European V.H.F. Contest†
September 6	- D/F National Final
September 20	- Low Power Field Day
September 27	- R.A.E.N.
November 7-8	- Second 1·8 Mc/s Contest
November 21-22	- R.S.G.B. Telephony Contest

* Details in this issue.
† These contests are arranged to take place during the periods suggested by the Region 1 V.H.F. Committee.
‡ For rules, see page 294, R.S.G.B. *Bulletin*, December, 1958.
§ For details, see page 451, R.S.G.B *Bulletin*, March, 1959.
‖ For details, see page 493, R.S.G.B. *Bulletin*, April, 1959.

First 70 Mc/s Contest 1959

When: From 17.00 to 23.59 G.M.T. on June 20 and from 07.00 to 19.00 G.M.T. on June 21, 1959.

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: 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).

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

(*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 contacted," " His Band (Mc/s)," " Points Claimed."

(c) Entries must be postmarked not later than Monday, July 6, 1959.

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 non-transmitting member submitting the best check log in the opinion of the Contests Committee.

The General Rules for R.S.G.B. Contests published on page 348 of the January 1959 *Bulletin* apply to this contest.

D/F Qualifying Event

DETAILS of the High Wycombe D/F Qualifying Event are as follows:

Sunday, June 28.
Organizer: J. K. Finch, Ernest Turner Electrical Instruments Ltd., High Wycombe.
Frequency: 1874 kc/s.
Call-sign: G3FAS.
Map: Ordnance Survey, New Popular Edition, Sheet 159.
Assembly Point: Hydeheath Common, approximately 2 miles east of Great Missenden. (N.G.R. SP/928005).
Assembly Time: 13.30 B.S.T.
Entries and Tea: Intending competitors should notify the Organizer as soon as possible stating the number in their party requiring tea, which will be at the Little Abbey Hotel, Great Missenden (N.G.R. 905997).

Second 144 Mc/s Field Day 1959

R.S.G.B. members throughout Europe are again invited to take part in this contest, the details of which are given below.

When: 10.00 G.M.T. to 19.00 G.M.T. on Sunday, July 5, 1959.

Sections: (*a*) *Portables* must operate from the same site throughout the contest.

(*b*) *Mobiles* must quote the location from which each contact is made.

Eligible Entrants: All fully paid-up 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: May be made on A1, A2, A3 or A3a with an input not exceeding 25 watts to any stage in the transmitter.

Scoring: Points will be scored on the basis of one point per mile for contacts with fixed stations and two points for contacts with other portables or mobiles.

Contest Exchanges: RST (RS) reports followed by the band identification letter A and the contact number and location (e.g. RST559A001 5NE Luton).

Logs: (*a*) Must be tabulated in columns headed (in this order) " Date/Time (G.M.T.)," " Call-sign of Station Worked," " My Report on his signals and Serial Number sent," " His Report on my signals and Serial Number received," " Location of Station Contacted," " Distance," " Points Claimed."

(*b*) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed.

(*c*) Entries must be postmarked not later than Monday, July 20, 1959.

Awards: At the discretion of the Council, a miniature cup will be awarded to the winner and certificates of merit to the runner-up and to the leading mobile station. A certificate of merit will also be be awarded to the non-transmitting member submitting the best check log in the opinion of the Contests Committee.

The General Rules for R.S.G.B. Contests published on page 348 of the January 1959 *Bulletin* apply to the contest.

R.S.G.B. Contest Forms

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

More Overseas Awards

AUCKLAND Branch of the New Zealand Association of Radio Transmitters offers an attractive four-colour certificate (known as the Auckland Branch Certificate or A.B.C.) to any amateur outside New Zealand who has had contacts since January 1, 1957, with 15 or more members of the Branch. Stickers are available for "All Phone," "All C.W." and for each additional five stations worked. Applications for the certificate, with a list of the stations worked giving date, time, band and whether c.w. or phone, should be sent to Mark H. Churton (ZL1TB), 2 Maungawhau Road, Epsom, Auckland, New Zealand.

The Radio Club de Québec offers the Diplôme de la ville de Québec (Quebec City Diploma) to applicants submitting proof of contact with three different stations in the City. Applications, accompanied by one International Reply Coupon, should be sent to Alex. Desmeules (VE2AFC), 186 Aberdeen Street, Quebec City, Canada.

The Worked All Canada (W.A.C.A.N.) Award is offered by the Nortown Amateur Radio Club (VE3NAR) to amateurs who submit two QSL cards from each Province and Territory of the Dominion. In each case, the two cards must be from different stations and for contacts on different bands. All contacts must have taken place since March 31, 1949. Applications for the Award, accompanied by the 22 QSL cards and a fee of $1 (or 10 I.R.C.s) should be addressed to Nortown Amateur Radio Club, P.O. Box 356, Adelaide Street Postal Station, Toronto, Canada.

The Worked All ZS Call Areas (W.A.Z.S.) award in issued by the South African Radio League, P.O. Box 3911, Cape Town, South Africa. Claimants must produce evidence of having established two-way communication with 100 South African amateur stations since January 1, 1958. The 100 contacts must be made up of ZS1 (16), ZS2 (10), ZS3 (1), ZS4 (9), ZS5 (16), ZS6 (45), ZS7 (1), ZS8 (1), ZS9 (1).

QSL cards from 20 different Norwegian stations, six of which must be situated north of the Arctic Circle, must be submitted with claims for the Worked All LA (W.A.L.A.) certificate issued by the Norwegian Radio Relay League, P.O. Box 898, Oslo, Norway. Applications should be accompanied by 10 I.R.C.s.

A leaflet giving details of the Worked Valencia Diploma (T.D.V.) may be obtained from EA5EL, U.R.E., P.O. Box 453, Valencia, Spain.

Amateurs resident in Europe who wish to obtain the Worked All OE (W.A.OE.) certificate must work three different stations in each of the eight Austrian call districts on three bands (OE4 and OE9 count as one district for the purposes of this award). One of the bands used must be either 3·5 or 7 Mc/s. All contacts must have been made since January 1, 1957. Applications for the certificate, accompanied by the 24 QSL cards and 10 I.R.C.s should be sent to Oe.V.S.V., P.O. Box 15, Klosterneuberg 2, Austria.

The Radio Society of East Africa has instituted the " Worked All VQ Award " which is available to licensed radio amateurs throughout the world. QSL cards from at least four of the VQ call areas must be submitted. Full details may be obtained from Kenneth R. Long (VQ4KRL), R.S.E.A. Awards Manager, P.O. Box 30077, Nairobi, Kenya.

ZC4LL/P in N.F.D.

THROUGHOUT the period of National Field Day on June 6-7, 1959, ZC4LL/P will be in operation on all bands from 7 to 28 Mc/s, looking for contacts with U.K. stations taking part in the event. This is almost certainly the last occasion on which a ZC4 station will take part in N.F.D. as it is expected that different call-signs will be issued by the new Cyprus Republic.

Letters to the Editor . . .

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

Intruder Watch

DEAR SIR,—May I remind members that they can help themselves and the Society, by sending me accurate reports of persistent intruders in the *exclusive* amateur bands? In order to be of maximum value, information must include date, time, frequency, call-sign or other identity where possible, type of transmission, short traffic sample. Those who report should give their location, the type of receiver in use, and its i.f. Immediately such reports are received, the intruder is monitored and appropriate action taken via R.S.G.B./G.P.O. Even if the station is already known to us, separate reports are useful by way of confirmation. All reports are acted upon, although it is sometimes not possible to send individual acknowledgements.

We are still in urgent need of Intruder Watch stations in GC, GM and GI, and also of the help of an amateur having equipment to record teletype and similar transmissions. The work need only involve a few hours each month. Volunteers are invited to write for details.

Whilst help has been forthcoming from a good many amateurs, I should like, through the medium of the BULLETIN, to record my special thanks to G3BTC, G3JSN and G3MND, whose accurate and intelligent reports over a long period have made a valuable contribution to the task of helping to clear our bands of unauthorized stations.

Yours faithfully,

3 Norris Gardens, Grange Estate, Havant, Hants. — D. W. J. HAYLOCK (G3ADZ), Hon. Organizer, R.S.G.B. Intruder Watch.

Coming of Age of R.A.F. Amateur Radio Society

"Benny" puts us right

DEAR SIR,—I was pleased to see a short article in the April BULLETIN recording the 21st anniversary of the formation of the R.A.F. Amateur Radio Society. May I, however, correct the caption of the photograph of myself taken at Cranwell by G6TV in 1937? The rig shown is that of my own 10 watt station which I used in the low power VK/ZL contest of that year (and won). So far as I recall G8FC did not take part in any contests that year as this activity and also that of using "phone," was not favoured for the 150 watt club station. Using 150 watts wasn't "playing the game."

In marking the passing of 21 years' activity, mention must be made of the exceptional work done by the two founder members who have shared the task of Hon. Secretary of the Society in all that period—Norman Davis (G6TV) from 1937 till after World War 2 when he left Cranwell and Ron Weston (G6PZ) who took over from G6TV at Cranwell and in recent years has continued to keep in touch with some three or four hundred members throughout the world, from the present H.Q. of the Society at Locking.

Congratulations to the R.A.F.A.R.S. and its hard-working H.Q. members. Here's to the next 21 years.

Yours faithfully,

Bentley Priory, Stanmore, Middx. — (S/Ldr.) H. E. BENNET (G8PF), A.M.(Brit.), I.R.E., R.A.F.

DX Contests

DEAR SIR,—Regarding the subject of DX Contests raised by G3BID in the March BULLETIN, and others before him, as one of the many DX enthusiasts I feel very strongly on this subject, particularly in view of the apparent increase in the number of these events.

Most of us are more or less fully occupied for at least five days of the week earning our bread and the means to pursue our hobby; and during those working days we contemplate the few intriguing hours we hope to spend on the air at the weekend. I can think of nothing more frustrating than to switch to the bands on Saturday or Sunday morning and find them completely jammed up with "BK 569026 73." It reminds me somehow, of a crowd of healthy youngsters loose in the woods with a pocket-knife competing for the maximum number of notched trees. It certainly has nothing experimental about it, unless our aim is to discover which amateur has the greatest mental and physical stamina.

As a one-time professional operator, the type of operating demanded by a contest is routine—but as a hobby it is "for the birds."

The plan, as suggested by G3BID, would be an admirable solution to this problem, and should be very seriously considered.

Yours faithfully,

Victoria, B.C., Canada. — S. B. SPENCER (VE7AMD), M.R.S.G.B.

DEAR SIR,—I should like to reply to Mr. Wagner's letter in the March BULLETIN and to challenge some of the statements therein.

Mr. Wagner states that it is a well known fact that only a minority of DX enthusiasts take part in contests. If this were so, surely there would be little QRM during contest weekends? In any case I would doubt this statement since one has only to note the number of contacts made by winning stations. Additionally a large number of participants do not submit scores—they merely join in for the enjoyment derived.

Those who do not enjoy contests have only to use c.w. during a telephony contest and telephony during a c.w. contest to avoid any QRM occasioned by a contest. It would doubtless do a large number of telephony enthusiasts a lot of good to get out their dusty bug keys and rattle off a few contacts at 30 w.p.m.

There is another point, without contests many amateurs would never have a chance to work some of the rarer countries since with the increasing world amateur population it is quite impossible for the lower powered stations to compete with the higher powered stations during normal operating conditions, with contacts taking, say, 15/20 minutes each.

I feel that there is a certain amount of selfishness in Mr. Wagner's attitude—would he like the Minister of Transport to ban all pleasure motorists from the roads during weekends so that he can drive his car around the roads and lanes in comfort working mobile?

Yours faithfully,

South Croydon, Surrey. — G. G. E. BENNETT (G5BZ).

A.C./D.C. Techniques

DEAR SIR,—I have always considered that the articles published in the BULLETIN are basically safety conscious, but I was horrified to see the article by G2UJ on a "Simple Capacity Bridge." A small paragraph in italics issues a warning about not having a mains transformer; this would have been better blazoned as a headline. Surely the additional cost of a small transformer of the type used for TV tuners is better than the risk involved in using a.c./d.c. techniques. No self-respecting engineer or radio amateur should even think about saving the cost of a transformer. Surely the Technical Committee should take G2UJ to task for writing such an article and advocating such malpractice; likewise the Editorial staff should be cautioned about letting such manuscripts be published.

May I trust, Sir, that this is the last time that the approved organ of the Society will encourage such poor and reprehensible circuit techniques?

Yours Faithfully,

London, S.W.17 — ALAN R. DYER (G3IDF).

DEAR SIR,—In answer to Mr. Dyer's criticisms of my article on a simple capacity bridge in the March issue of the BULLETIN, I would say that the Society does indeed recognize safety precautions in the construction of apparatus. The article in question in common with all technical articles published in the BULLETIN was seen by at least one member of the Technical Committee and it is presumed, therefore, that my warning that certain precautions should be taken in the construction, including the isolation of the bridge from the mains by adequately rated condensers, was considered sufficient.

Yours faithfully,

Tunbridge Wells, Kent. — W. H. ALLEN (G2UJ).

Regional and Club News

Amateur Radio Club of Nottingham.—At the A.G.M. the following were elected: *Chairman*—Douglas Legge (G3MP); *Hon. Treasurer*—Arthur Gwynne (G3LNR); *Hon. Secretary*—E. C. Weatherall, 16 Avenbury Close, Clifton, Nottingham; *Committee Members*—Alan Walmesley (G2HIO), Michael Brooks, Beverley Sutton. Meetings are held on Tuesdays and Thursdays at Woodthorpe House, Mansfield Road, Nottingham, commencing at 7.15 p.m. Slow Morse classes are held on Tuesdays and advanced classes on Thursdays. R.A.E. instruction is conducted by Alan Davies (G3LXL) while discussion groups covering every aspect of Amateur Radio are arranged by G3MP. On May 19 G6CW is giving a talk on s.s.b.

Bailleul Radio Society.—The main transmitter, now in use under the society's call-sign G3IHH, is producing excellent results on the DX bands. A three band cubical quad is to be mounted on a 40 ft. lattice tower now under construction. *Hon. Secretary:* G. Seeney (G3HDD), 3 Trg. Bn. R.E.M.E., Arborfield, Reading.

Barnsley and District Amateur Radio Club.—Meetings are held at the King George Hotel, Peel Street, on the second and fourth of each calendar month, commencing at 7.30 p.m. Prospective members and visitors will be most welcome. *Hon. Secretary:* P. Carbutt (G2AFV), 19 Warner Road, Pogmoor, Barnsley.

Bristol.—There was an attendance of 60 at the April meeting when Tony Blackmore (G3FKO) gave an interesting account of his visit to South Australia, illustrated by an 8 mm. colour film and a number of colour slides. During the meeting a tape-recorded message from Bob Lane (ex-G2BYA), now living in Seattle, U.S.A., was played back. On May 21, a special meeting will be held at the Grand Hotel in association with Mullard Ltd. when the films *Conquest of the Atom* and *From us to view* will be screened. Members willing to help in the organization of N.F.D. and the Longleat Mobile Rally in June are asked to notify the C.R., Eric Chambers (G2FYT). *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 7.

Cambridge and District Amateur Radio Club.—There will be a talk on R.A.E.N. at the meeting at the "Jolly Waterman," Chesterton Road, Cambridge, on May 29 commencing at 7.45 p.m. *Hon. Secretary:* H. Waton (G3GGJ), New Road, Barton, Cambridge.

Clifton Amateur Radio Society.—Recent events have included visits by members of the North-west Kent Radio Society when C. J. Leal (G3ISX) gave a talk on "Aerials and the Amateur" and by members of the Mitcham Radio Society to hear a lecture on D/F Contest Operating. G4ZU was due to give a talk on "Practical Transistor Circuits" on May 8 while a Junk Sale is arranged for May 29. The society's first D/F event will be held on May 17, the assembly point being Green Street Green, near Farnborough, Kent. Meetings are held at 225 New Cross Road, London, S.E.13 on Fridays. The club station G3GHN is active on Top Band on these evenings.

Cornish Radio and Television Club.—At the A.G.M. the following were elected: *President*—R. Penrose; *Chairman*—W. Locke; *Vice-Chairman*—L. Rogers (G2FQD); *Hon. Treasurer*—N. Elliott; *Hon. Secretary*—G. Hubber, 9 Cardrew Terrace, Redruth; *Assistant Hon. Secretary*—A. Olds (G3KFP). It was reported that membership increased slightly during the year.

Crystal Palace and District Radio Club.—Details of this club's activities may be obtained from the *Hon. Secretary:* G. M. C. Stone (G3FZL), 10 Liphook Crescent, London, S.E.23.

Grafton Radio Society.—The society's recent Top Band Contest for the G2AAN Cup was won by G3KQZ, followed by G3RX, G3JZX and G3KGC. The main activity at the moment is preparation for the annual field day at Hampstead Heath on June 13-14 when G3AFT/P will be in operation on the h.f. bands using c.w. and G2CJN/P on phone and c.w. on 1·8, 3·5 and 7 Mc/s. A welcome visitor was Bernard Randall (GW3ALE), a Past President of the society. *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

Halifax and District Radio Society.—The April meeting at the Sportsman Inn, Ogden, took the form of a quiz on licence conditions conducted by H. Swift (G3ADG). *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Liverpool and District Amateur Radio Society.—A comprehensive programme has been arranged for the coming months in addition to the meetings on Tuesdays at 8 p.m. in the Gladstone Mission Hall, Queens Drive, Childwall. A "bucket and spade" party at Llandudno has been arranged for May 31. Forthcoming lectures include "Relays" on May 19 and "Aerials" by W. D. Wardle (G3EWZ) on May 26. N.F.D. arrangements will be discussed on June 2 while the "inquest" will be on June 9. Members will be operating GB3AHD at the Liverpool Show from July 16-18. H. James (G3MCN), 448 East Prescot Road, Knotty Ash, Liverpool 14, is the new *Hon. Secretary* in succession to W. D. Wardle (G3EWZ) who is shortly leaving the district.

Medway Amateur Receiving and Transmitting Society.—Meetings are held on alternate Mondays at 7.30 p.m. at the Viscount Hardinge Hotel, High Street, Gillingham. Recent highlights have included a lecture and demonstration of stereophonic sound reproduction by Mr. Brown of the Admiralty and a film show by Mr. Bounds of the South Eastern Electricity Board. *Hon. Secretary:* G. A. Gascoigne (G3LCC), 78 Valley View Road, Rochester.

Pontypool Amateur Radio Club.—Recent events have included lectures on "Tapes," "Mobile Operation" and "Aerials" and the screening of the films *Mirror in the Sky* and *Decca Navigator.* Meetings are held on Tuesdays at 7 p.m. in the Educational Settlement, Rockhill Road, Pontypool. Local R.S.G.B. Group meetings are held on the third Tuesday in each month. Prospective members are invited to attend meetings. Further details of activities in the district may be obtained from the *Hon. Secretary and T.R.:* J. S. Hammond (GW3JBH), 46 High Street, Abersychan, Pontypool, Mon.

Reading Amateur Radio Club.—Meetings are held at the Palmer Hall, West Street, Reading, on the last Saturday in each month commencing at 7 p.m. On May 30, G3GKH will be discussing v.h.f. equipment. The following officers have been elected: *Chairman*—Lt.-Col. N. I. Bower (G5HZ); *Hon. Treasurer*—Mr. Boys; *Hon. Secretary*—R. G. Nash (G3EJA), "Peacehaven," 9 Holybrook Road, Reading.

Reigate Amateur Transmitting Society.—This new society has been formed with the aim of furthering the spirit and interests of Amateur Radio in the Reigate and Redhill area. The *Chairman* is P. D. Lucas (G3JDN) 14 Rushetts Road, Reigate, and the *Hon. Secretary/Treasurer* F. D. Thom (G3NKT), 12 Willow Road, Redhill. An Amateur Radio demonstration is to be given at Reigate Grammar School Fair on May 30 when G3JDN/A and G3NKS/A will be active on all bands from 1·8 to 144 Mc/s. Contacts will be acknowledged by specially printed QSL cards.

Slade Radio Society.—Meetings have been arranged at The Church House, High Street, Erdington, for May 22 ("Receivers and Electronic Test Equipment" by D. T. Wilson of Airmec Ltd.), June 5 ("Contest and DX Working" by D. A. G. Edwards, G3DO) and June 19 ("The Design of Direction Finding Receivers" by G. Nicholson (G3HKC) and C. N. Smart). Further details of the society's activities may be obtained from the *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.

South Shields and District Amateur Radio Club.—Radio Controlled Models will be demonstrated at the meeting at Trinity House Social Centre, Laygate, on May 27 at 7.30 p.m. Owen Jackson (G3LKZ) has been elected *Chairman* in succession to W. Smith (G5WZ) who is leaving the district and Ron Ray (G3NCL) has been elected to the Committee. *Hon. Secretary:* K. Sketheway (B.R.S.20185), 51 Baret Road, Walkergate, Newcastle-on-Tyne 6.

Stockport Radio Society.—At the recent A.G.M. the following were elected: *Chairman*—W. P. Green; *Vice-Chairman*—R. Hobson (G3JRQ); *Hon. Treasurer*—W. H. Banks (G2ARX); *Hon. Secretary*—G. R. Phillips (G3FYE), 7 Germans Buildings, Buxton Road, Stockport; *Committee Members*—A. Evans, E. Wigzell, H. Smith, G3AYT (A.S.R.), R. Kilminster (G3JHK); *Hon. Auditor*—F. E. Wood (G4JN).

Stoke-on-Trent Amateur Radio Society.—New officers of the society were elected at the recent A.G.M. Activities have included work on the country shack during the Easter weekend, a demonstration of Amateur Radio to a local political association and the North Midlands Mobile Rally in association with the Midland Amateur Radio Society on April 26. *Hon. Secretary:* V. J. Reynolds (G3COY), 90 Prince's Road, Hartshill, Stoke-on-Trent.

Surrey Radio Contact Club.—At the A.G.M. the following were elected: *Chairman*—W. B. Wynn (G8TB); *Vice-Chairman*—R. Dabbs (G2RD); *Hon. Treasurer*—J. North; *Hon. Secretary*—S. Morley (G3FWR), 22 Old Farleigh Road, Selsdon, South Croydon; *Committee Members*—W. D. Pye (G3DFP), E. F. Jones (G3EUE), D. A. R. Naylor (G3GHI), L. C. Mansfield (G3LCM/T). Meetings are held on the second Tuesday of each month at the "Blacksmith's Arms," South End, Croydon, commencing at 7.30 p.m. Prospective members and visitors are cordially invited to attend.

Thames Valley Amateur Radio Transmitters Society.—The following were elected at the A.G.M.: *President*—Leslie Cooper (G5LC); *Vice-President*—Alan Mears (G8SM); *Hon. Treasurer*—Graham Leicester (G3IKC); *Hon. Secretary*—Ken Rogers (G3AIU); *Contests Manager*—Gerry Billison (G6GB); *Committee Members*—Joe Hill (G3JIP) and John Kingston (G3VK). F. J. Charman, B.E.M. (G6CJ) has been elected an Honorary Member. Recent lectures have included "Development and Applications of the Transistor" by J. Hill (G3JIP). Details of future meetings are given in *Forthcoming Events*.

Torbay Amateur Radio Society.—The society's own call-sign G3NJA was used for the first time in connection with the Amateur Radio exhibit at the Newton Abbot Rotary Hobbies Exhibition in April. Equipment was loaned by G3ABU and comprised a Top Band mobile rig and a main transmitter running 80 watts input. Excellent results were obtained. *Hon. Secretary:* G. Western (G3LFL), 118 Salisbury Avenue, Barton, Torquay.

West Lancs. Radio Society.—At the A.G.M. held recently, the following were elected: *Chairman*—G. McCracken (G3GST); *Hon. Treasurer*—K. Coates (G3IZT); *Hon. Secretary*—A. Treanor (G3FZG), 13 St. Johns Road, Waterloo, Liverpool 22. Meetings are held on Tuesdays commencing at 8.30 p.m. at "Colonsay," Crosby Road South, Waterloo, while Morse and Theory classes are held on Thursdays. A Junk Sale has been arranged for May 19, a TVI Discussion for May 26 and a lecture entitled "Filters and Attenuators" by G3BBI for June 2.

Representation

THE following is an addition to the list of Town Representatives published in the December 1957 issue:

REGION 7

LONDON WEST—PADDINGTON & ST. MARYLEBONE AREA
J. E. ALBAN (G3JEA), 172 Droop Street, London, W.10.

Affiliated Society Representative

THE following has been appointed an Affiliated Society Representative for the year 1959.

GRAVESEND AMATEUR RADIO SOCIETY: V. H. S. CURLING (G6VC), 66 Burch Road, Gravesend, Kent.

Worthing "Bucket and Spade" Pariy

THE popular "Bucket and Spade" Party organized by the Worthing and District Amateur Radio Club will be held this year on June 28. G3GVM/A will act as control station to talk-in mobiles. All the usual features are being arranged and full details may be obtained by sending a s.a.e. to the Hon. Secretary of the Club, J. R. Tootill, 113 Kings Road, Lancing, Sussex.

LONDON U.H.F. GROUP
will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,
at 7.30 p.m. on Thursday, June 4, 1959
All v.h.f. and u.h.f. enthusiasts welcome.

Slow Morse Practice Transmissions

B.S.T.	Call-sign	kc/s	Town
Sundays			
09.00	G3BHS	1810	Southampton
10.30	G3FFA	1935	Barnet
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
12.00	G3LP	1850	Cheltenham
12.00	GI5UR	1860	Belfast
15.00	G3LEQ	1900	Tunbridge Wells
20.00	G3MRA	1915	Southampton
20.30	G3HTA	1850	Exeter
21.00	G2FIX	1812	near Salisbury
Mondays			
18.00	G3GZE	1840	Blackburn
18.30	G3NC	1825	Swindon
19.00	G3KTP	1850	Heanor, Derby
19.00	G3LMT	1850	Exeter
20.00	G3MDH	1915	Southampton
20.30	G3AGN	1875	Felixstowe
20.30	G3MXI	1910	Derby
21.30†	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Tuesdays			
17.30	G2AAM	1875	Swanwick, Derbys.
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
20.00	G2FCI	1850	Exeter
20.00	G3BHS	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
21.00	G3EFA	1855	Southport
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
Wednesdays			
18.00	G3GZE	1840	Blackburn
19.00†	G3MCJ	1845	Exeter
	G3FLK		
	G2FCI		
	G3HTA		
19.00	G3LZC	1830	Heanor, Derby
19.00	G8RQ	1850	Chesterfield
20.00	G3IBI	1915	Southampton

B.S.T.	Call-sign	kc/s	Town
Wednesdays			
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MXI	1910	Derby
21.00	G3BHS	1810	Southampton
21.00–22.00	G3AGX	1920	Hull
22.00†	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Thursdays			
17.30	G2AAM	1981	Swanwick, Derbys.
18.30	G3NC	1825	Swindon
20.00	G3NBV	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3GDZ	1910	Kingsbury, N.W.9
21.00	G3BHS	1810	Southampton
21.30	G3HMY	1850	Exeter
Fridays			
18.30	G3DMN	1880	Ipswich
	G3FVP		
19.30	G3FUA	1850	Kilburn, Derby
19.30	G3MHR	1850	Swanwick, Derbys.
20.00	G3JLS	1915	Southampton
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.00	G3BHS	1810	Southampton
21.30†	G3KLZ	1900	Bradford
	G3KSS		
22.00	G3KYU	1859	Bournemouth
22.00†	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Saturdays			
09.00	G3MRA	1915	Southampton
13.00	G2FXA	1900	Stockton-on-Tees
20.00	G3MCL	1915	Southampton

† *Alternately.*
• *Slow Morse QSO.*

Forthcoming Events

Details for inclusion in this feature *must* reach the appropriate Regional Representatives *not later than 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 copy in the style used below.

REGION 1

Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m., Squires Gate Holiday Camp.
Bury (B.R.S.).—June 9 (Junk Sale), George Hotel, Kay Gardens.
Crosby.—Tuesdays, 8.30 p.m., "Colonsay," Crosby Road South, Waterloo, Liverpool, 22.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
Manchester (M. & D.R.S.).—June 8 ("This, That and T'other," by D. Barber, G2AKR), 7.30 p.m., Wellington Hotel, Nicholas Croft, High Street.
Manchester (S.M.R.C.).—May 22, Ladybarn House, Mauldeth Road, Manchester, 20.
Preston (P.A.R.S.).—May 6, 20, 7.30 p.m. Fruiterers' Club, High Street.
Stockport (S.R.S.).—May 20 (N.F.D. Discussion) June 3 ("Radio Links"), 8 p.m., The Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—May 15, June 5, 19, 7.45 p.m., No. 4 Hamilton Square, Birkenhead.

REGION 2

Barnsley (B. & D.A.R.C.).—May 22 ("Power Supplies and Voltage Regulation," by N. Simpson) June 12 ("Crystal Controlled Converters," by W. Williams), 7.30 p.m., King George Hotel, Peel Street.
Bradford (B.A.R.S.).—May 26 Visit to Emley Moor I.T.A. Station (provisional date); June 9 ("Oscilloscope Design and Construction," by G. F. Craven); June 23 (Lecture by L. A. F. Stockley, G3EKE), 7.30 p.m., Cambridge House, Little Horton Lane, Bradford.
South Shields (S.S. & D.A.R.C.).—May 27, (Demonstration of radio controlled models), 7.30 p.m., Trinity House, Social Centre, Laygate.

REGION 3

Birmingham (M.A.R.S.).—May 19 ("Relay Control of Amateur Equipment," by Mr. Yates); June 4 (Lecture/Demonstration), 7.30 p.m., Midland Institute, Paradise Street. **(Slade).**—May 22 ("Receivers and Electronic Equipment," by Mr. Wilson of Airmec Ltd.); June 5 ("Contest and DX Working," by G3DO), 7.30 p.m., The Church House, High Street, Erdington. **(South).**—May 29 (N.F.D. Arrangements), 7.30 p.m., Moseley Friends Institute.
Coventry.—May 22 ("Radio Theory," by J. Boyce), 7.30 p.m., Vine Street School. **(C.A.R.S.).**—May 25 ("Mobile Working," by G5PP), June 1, 8, 7.45 p.m., 9 Queen's Road, Coventry.
Stourbridge (St.A.R.S.).—May 22, 8 p.m., "White Horse," Amblecote; June 2 (Film), 8 p.m., Brotherhood Hall, Scotts Road, Stourbridge.

REGION 4

Derby (D. & D.A.R.S.).—May 20, 27 (Beginners' Demonstration); June 3 (Auction Sale of Surplus Items); June 10 (Proposed Visit Oaklands Amateur Observatory); June 17 (Direction Finding Practice Run), 7.30 p.m., Room No. 4, 119 Green Lane, Derby.
Derby (D.S.W.Exp.S.).—Sundays 10.30 a.m.; May 21, 28, June 4, 11, 7.30 p.m., Club Room, Nunsfield House, Boulton Lane, Alvaston, Derby.
Leicester (L.R.S.).—May 25, June 1, 8, 15, 7.30 p.m., Old Hall Farm, Braunstone Lane, Leicester.
Lincoln (L.S.W.C.).—May 20, June 3, 17 (R.A.E. Classes), 7.30 p.m., Technical College, Cathedral Street.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
Oxford (O. & D.A.R.S.).—May 27, June 10, 7.30 p.m., Cherwell Hotel, Water Eaton Road, Oxford N.

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m. on Fridays, May 15, June 19 and July 17, 1959

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

REGION 7

Acton Brentford & Chiswick.—May 19; June 16 (Field Day Inquest), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Barnet (B. & D.R.C.).—May 26 ("Mobile Operation," by John A. Rouse, G2AHL), June 30 ("Interference Suppression," by G.P.O. representative), 7.30 p.m., The Red Lion Hotel, High Barnet.
Bexleyheath (N.K.R.S.).—May 28 (A.G.M.), 8 p.m., Congregational Hall, Clock Tower, Bexleyheath.
Chingford.—May 22 ("Transistor Power Supplies"), 8 p.m., G3KZI, 12 Broadwalk, Woodford, Essex; June 5 ("N.F.D."), 8 p.m., G4GA, 1 Templeton Ave, South Chingford, E.4.
Croydon (S.R.C.C.).—June 9, "Blacksmiths' Arms," Croydon.
Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, W.5.
East Molesey (T.V.A.R.T.S.).—June 3 ("Transistors," J. Hill, B.Sc., G3JIP), Carnarvon Castle Hotel, Hampton Court.
Harlow & District.—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street.
Holloway (G.R.S.).—Mondays & Wednesdays (R.A.E. and Morse); Fridays (Morse and Club), 7 p.m., Montem School, Hornsey, N.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road, Ilford.
Kingston.—Lecture alternate Thursdays. Theory and Morse classes weekly, 7.45 p.m., Y.M.C.A., Eden Street, Kingston-on-Thames.
New Cross (C.A.R.S.).—Fridays, 7.30 p.m., 225 New Cross Road, S.E.13.
Norwood & South London.—May 16 ("Tape Recording," by Roy Mallinson, G3GOG), June 18 (Junk Sale), 7.30 p.m., Windermere House, Westow St., Crystal Palace.
Romford (R.D.A.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford, Essex.
Slough.—June 1 ("N.F.D."), 7.45 p.m., Stag Hotel, Wexham Street, Wexham.
Welwyn Garden City.—Thursday June 11 ("Inquest on N.F.D."), 8 p.m., I.C.I. Recreation Club, Black Fan Road, Welwyn Garden City.

REGION 9

Bath.—June 15, 7.30 p.m., 12 James Street West, Bath.
Bristol.—May 21 (Film Show by Mullard), 7.30 p.m., Grand Hotel, Bristol; June 19 (Modern Amateur Equipment), 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol.
Exeter.—June 11 ("TVI," by J. Scanes), 7.30 p.m., Redcroft, Clifton Hill, Exeter.
Torquay.—June 13, 7.30 p.m., Y.M.C.A., Castle Road, Torquay.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff.—June 8 ("Analysis of Field Day Results"); July 13, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff; June 17 (Visit to B.B.C. Television Transmitters, Wenvoe). Final details at June 8 meeting.
Penarth.—May 25 ("Command Receivers," by John Douglas, GW2CAS), Y.M.C.A. Hall, Penarth.
Pontypool (P.A.R.C.).—May 19 ("Valve Testing Night"), 7.0 p.m., Educational Settlement, Rockhill Road, Pontypool.

REGION 11

Prestatyn (F.R.S.).—May 18, June, 1, 15 (Field Days discussion), 7.30 p.m., Railway Hotel, Prestatyn.

REGION 13

Edinburgh (L.R.S.).—May 28 (N.F.D. Briefing); June 11 (A.G.M.), 7.30 p.m., 25 Charlotte Square, Edinburgh.

REGION 14

Falkirk.—June 5, 7.30 p.m., Temperance Cafe.
Prestwick.—Third Sunday in each month, 7.15 p.m., Royal Hotel.

REGION 17

Southampton.—July 4, August 1, 7 p.m., Prospect House (back of Gas Showrooms), Above Bar, Southampton.

DATES FOR YOUR DIARY

May 21-27.—International Transistor Exhibition, London.
May 24.—Northern Mobile Rally.
May 30.—Fifth International V.H.F./U.H.F. Convention, London.
June 14.—Longleat Mobile Rally.
June 21.—Harlow Mobile Rally.
June 28.—Worthing "Bucket and Spade" Party.
July 5.—Amateur Radio Mobile Society Rally, at Maldon, Essex.
July 19.—New Forest Mobile Rally.
August 16.—Derby Mobile Rally (Provisional).
August 16.—South Shields Mobile Rally.
August 23.—Tunbridge Wells Mobile Rally.
August 26-September 5.—National Radio Show, London.
August 30.—G6UT's Ham Party.
August 30.—South Manchester and Stockport Mobile Rally.
September 6.—London Mobile Rally.
September 12.—Ayr O.R.M.
September 13.—Glasgow O.R.M.
September 13.—Woburn Abbey Mobile Rally (Provisional).
September 20.—Lincoln Hamfest and Mobile Rally.
September 26.—Cardiff O.R.M.
October 10 or 11.—Southampton O.R.M. (provisional date).
October 24 or 25.—London O.R.M. (provisional date).
November 25-28.—R.S.G.B. Radio Hobbies Exhibition, London.

"Topsfest" and Mobile Rally

ALL radio amateurs are cordially invited to attend the Sixth Annual Topsfest, organized by G3ABG for the Tops C.W. Club. The event will be held on Sunday, June 21, at Walsall Road School, Cannock, Staffs., commencing at 3 p.m. An informal Mobile Rally will coincide with the Topsfest. Stations will be in operation from 2 p.m. on 1·9 Mc/s phone and 7 Mc/s c.w.

Walsall Road School is opposite the Car Sales on the A34, a quarter-mile south of Cannock town centre. For those coming from the south, the venue is three-quarters of a mile from the A5 at Churchbridge cross-roads. Buffet tea will be available at 5.15 p.m. at "The Tavern," an ideal spot for mobile working and in beautiful surroundings on the edge of Cannock Chase, one mile from Cannock town centre.

P.O. Exhibition

AMATEUR Radio played an important part in the Post Office (London) Youth Association Arts and Hobbies Exhibition held at G.P.O. Headquarters, King Edward Building, London, E.C.1, from March 10-12, 1959. G3HSE/A used a " Vanguard " transmitter and a Geloso G209 receiver, both loaned by K.W. Electronics Ltd., and a 40m dipole. Amateur-built equipment on show included a 100 kc/s crystal marker, tape recorder, oscilloscope, transistor receiver and a 2m transmitter. The operators of G3HSE/A received valuable assistance from Mr. N. Moore, Hon. Treasurer of the Clifton Amateur Radio Society.

The operators of G3HSE/A, G6HC (left) and G3HSE (centre) with an interested vistor to the Amateur Radio stand at the P.O. (London) Youth Association Arts and Hobbies Exhibition.

Heathkit Competition

THE competition arranged by Daystrom Ltd. in connection with the exhibition of Heathkit products at the Royal Hotel, London, during the period of the 1959 Audio Fair, was won by R. H. Owen, of London, S.W.6. Mr. Owen received a Heathkit S-88 stereophonic amplifier as his prize for the first correct assessment of the popularity of present British Heathkit models.

Book Review

SINGLE SIDEBAND FOR THE RADIO AMATEUR. (Second Edition. Edited by H.Q. Staff of A.R.R.L., 210 pages with numerous charts, tables, formulae, circuit diagrams, and photographs. Price 14/- from the R.S.G.B.

There is no doubt that s.s.b. demands a little mental effort to understand, but this has never been a good reason for ignoring better methods. That s.s.b. is the method which will dominate the telephony field in the future seems certain, and it already has a considerable following amongst amateurs.

This excellent digest of over fifty *QST* articles on all aspects of s.s.b. transmission and reception has, in this second edition, been greatly revised and expanded. The balance between theory and practice has been well made, and the collection of magazine articles has been so presented and rounded-off with connecting information, that the book is a most attractive and valuable text, and reference work, in the subject. It is copiously illustrated and is in the *QST* format and best A.R.R.L. traditions. T. P. A.

Can You Help?

● J. L. Marshall (A.1657), The Vicarage, Gomersal, Leeds, who would like to hear from members who have successfully converted the ex-Government receiver No. 78 to amateur use and the RDF-1 to 144 Mc/s operation.

For Your Bookshelf and Shack
R.S.G.B. PUBLICATIONS

A Guide to Amateur Radio (7th Edition)
Price 3/6 (by post 4/-)
R.S.G.B. Amateur Radio Call Book (1959 Edition)
Price 3/6 (by post 4/-)

★ ★ ★

Certificates and Awards **Price 1/- (by post 1/4)**
The Morse Code for Radio Amateurs
Price 1/- (by post 1/4)
The two books may be purchased for 2/- (post paid)

★ ★ ★

Valve Technique - **Price 1/6 (by post 1/10)**
V.H.F. Technique - **Price 1/- (by post 1/3)**
The two booklets may be purchased for 2/6 (post paid)

AMERICAN PUBLICATIONS

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

Radio Amateur's Handbook, 1959 (*A.R.R.L.*)	34/-
CQ Sideband Handbook (*Cowan*)	25/-
Mobile Manual for Radio Amateurs (*A.R.R.L.*)	24/6
CQ Mobile Handbook (*Cowan*)	24/-
Antenna Book, 8th Edition (*A.R.R.L.*)	19/-
Television Interference—Its Causes and Cures (*Nelson Publishing Co.*)	16/-
CQ Anthology (*Cowan*)	16/-
Single Sideband for the Amateur (*A.R.R.L.*)	14/-
Hints and Kinks, Volume V (*A.R.R.L.*)	10/-
Course in Radio Fundamentals	10/-
How to Become a Radio Amateur (*A.R.R.L.*)	4/6
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Prices for American publications are subject to alteration without notice.

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Headed Notepaper (R.S.G.B.) per 100 sheets	7/9

† *Delivery 3-5 weeks.*

MISCELLANEOUS ITEMS

Aveley Radio Tape Measure	6/-
Wireless World Valve Data (*Iliffe*)	6/-
Webbs' Log Book	5/-
Radio Amateur Operator's Handbook (*Data Publications*)	3/10
Guide to Broadcasting Stations (*Iliffe*)	3/-
R.A.E.N. Message Pads	2/-

All prices include postage unless otherwise stated.

R.S.G.B. Bookshop, New Ruskin House, 28/30 Little Russell Street, London, W.C.1.

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THE following have been elected to membership.

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22247 J. Nuttall, 27 Penswick Avenue, Anchorsholme, Blackpool.
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22249 593132 SAC C. J. Thomas, Signals Section, R.A.F., Gaydon, Leamington Spa.
22250 W. Winslade, Fairview, Hazlewood Road, Cudham Lane, nr. Sevenoaks, Kent.
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1915 F. G. Kirk, 1 Percy Road, Romford, Essex.

* Denotes transfer to Corporate Grade.

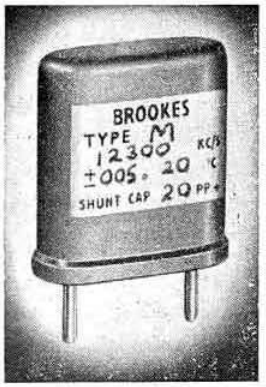
† Denotes previously a member.

Corrections

THE call-sign of Mr. J. D. Slater, 3 Pebbleford Road, Kettering, Northants., is G3FOZ and not as shown in the list of New Members published in the February issue of the *Bulletin*.

The name of the holder of the call GW3-KZO is 3523765 Cpl. M. V. Dennis, "Day Watch," 276 Signals Unit, R.A.F., B.F.P.O. 53, and not as published in the March issue.

In the list of New Members published last month Mr. I. A. M. Douglas was listed as G3NIO. His correct call-sign is G3NID. The call-sign GM3NIO is held by Mr. G. W. Douglas, 10 Burdiehouse Drive, Liberton, Edinburgh.



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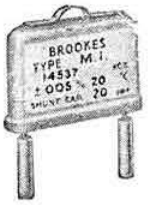

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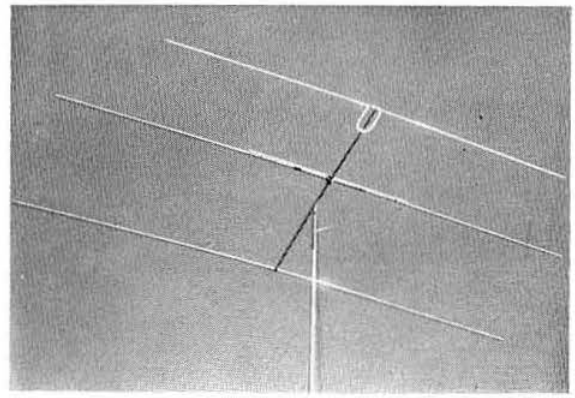

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Supplied with suppressed zero which requires 0·5 mA for full scale deflection (0 = 1·5 mA) but pointer is easily reset to zero by moving conventional hair spring adjuster behind dial, when 5 mA gives f.s.d.
Rear housing incorporates on/off switch (operated by rotating small knob on front face) and five-pin plug, two pins direct to meter and two to switch. Brand new, boxed, **12/6**, post free.

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