RSGB

BULLETIN

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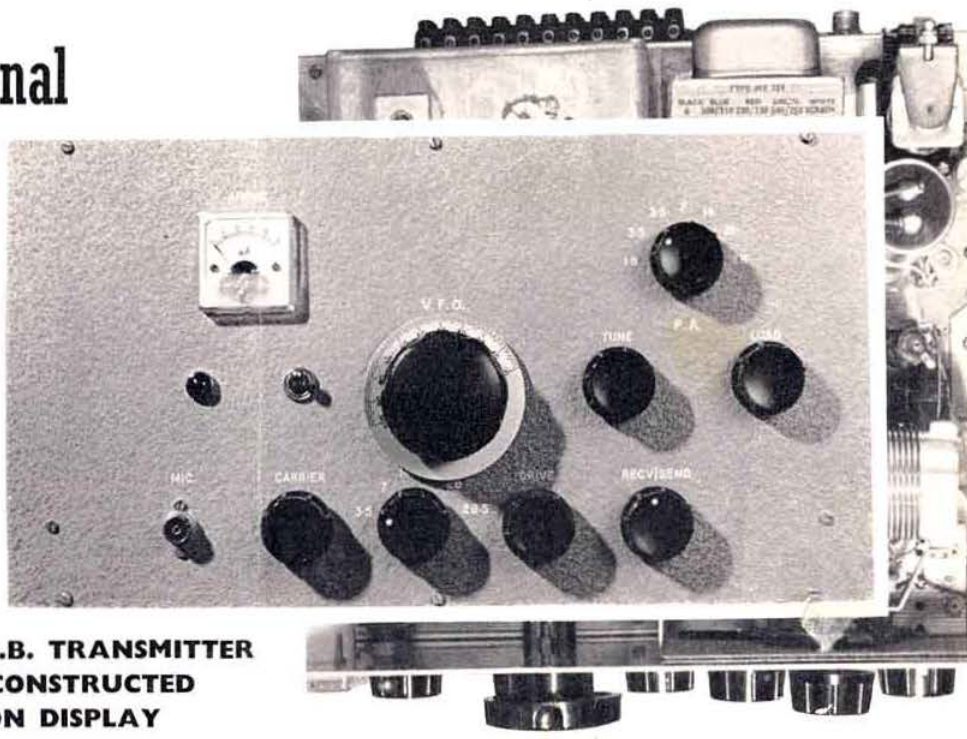
RSGB International Radio Communications Exhibition Oct 27–30



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FULL DETAILS OF THE EXHIBITION ARE ON PAGE 675

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RSGB BULLETIN

CONTENTS

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Front Cover: In last month's BULLETIN, on page 541, mention was made of a visit to headquarters by John Rogers, ZE4JN/G3UHC, while on his way to the USA to take up an appointment at the Iowa State University in the Department of Physics and Astronomy.

Mr. Rogers has been intensely interested in space and satellite research for some time, as a hobby, and the aerial on the cover of this issue was designed and constructed by himself as a satellite command aerial to form part of his experiments. His proudest achievement, however, is a 160 element switchable circular polarised v.h.f. aerial, fully steerable by remote control, which was employed during Dr. James Van Allen's Injun series satellite projects.

The RSGB Bulletin is published on the first Wednesday in each month by the Radio Society of Great Britain as its official journal and sent to all members.
The closing date for copy for the December issue is November 5.

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INDOORS—ZL4GA's JOYSTICK got him 569 on 3.5 mc/s from G5WP on 21st February, 1965 at 0850 GMT. Alan had worked VE7BIY on 3.5 mc/s at 559 and also logged 59 countries on 14 mc/s by that date, including LU1HBS and 9M4LP.

Testimonials continue to pour in!

W7OE
Howard S. Pyle, Electronics Engr., U.S. Govt., (retd)
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Mr R. F. Stevens, G2BVN, to be President during 1966

In accordance with Article 10 of the Society's Articles of Association, the Council has appointed Mr R. F. Stevens, G2BVN, to the office of President with effect from January 1, 1966.

Mr Stevens is at present Executive Vice-President and chairman of the Finance and Staff and Technical Committees and Chairman of the Society's IARU Working Group and the Society's IARU Liaison officer. He is also a member of the GPO Liaison and TVI Committee and the Scientific Studies Committee.

Mr Stevens was a member of the Society's delegation to the Region I IARU Meeting in Malmo, Sweden, in 1963 and will lead the RSGB delegation to the Region I meeting in Opatija, Yugoslavia, next May.

For some years, G2BVN contributed " The Month on the Air " to the RSGB BULLETIN in addition to technical articles. He was closely connected with the preparation of the present edition of the *RSGB Amateur Radio Handbook*.

Current Comment

discusses topics of the day

Why Mobile on Grandad's Band?

FOR some time we have been mystified as to why so many mobile operators use what is probably the most unsuitable band for their activities. The more or less slavish use of Top Band with all its noise, " fishphone " and static interference, power limitations and nothing but a poor compromise for an aerial are some of the reasons that lead one to think that mobile enthusiasts are in a rut and the wrong one at that!

Enquiries into the reasons for this situation bring forth some pretty illogical arguments with the possible exception of simplicity of equipment requiring the absolute minimum of effort. It appears, however, that this outlook is largely restricted to the British Isles. Isn't it about time we took stock of the position and made better use of the other bands, some of which would seem to be much more suitable for mobile operation?

Top Band 2 and 4m are the only bands in general use, and most mobile rallies only provide talk-in facilities on these bands. Around 90 per cent of the operators use Grandad's band. If asked why, most Top Band mobile operators reply that there isn't anyone to work on the other bands. On this basis there never will be.

Consider the aerial for Top Band: in spite of a good deal of experimentation with capacity hats, inductance loadings and spirally wound whips it can only be a relatively poor compromise. On 2m the situation is very different: a resonant aerial such as a halo or clover leaf can be used. The average ranges on both these bands is of the order of 30-40 miles and such ranges should be equally possible on 10m.

The best band for mobile use seems to us to be 10m where a full-size quarter-wave whip can be relied on to give a greater normal range than Top Band and probably even greater than 2 with the added advantage that sporadic *E* may provide some good DX from time to time. Like many others we have often had contacts with US and Canadian mobiles. Of course the equipment is somewhat more complicated than that required for Top Band.

The excuse that transistors will not work at 28 Mc/s is no longer true, good performance now being possible up to 1300 Mc/s. Some of the more powerful transistors may be high in price but inexpensive types for the exciter stages are obtainable and a valve can be used in the p.a.

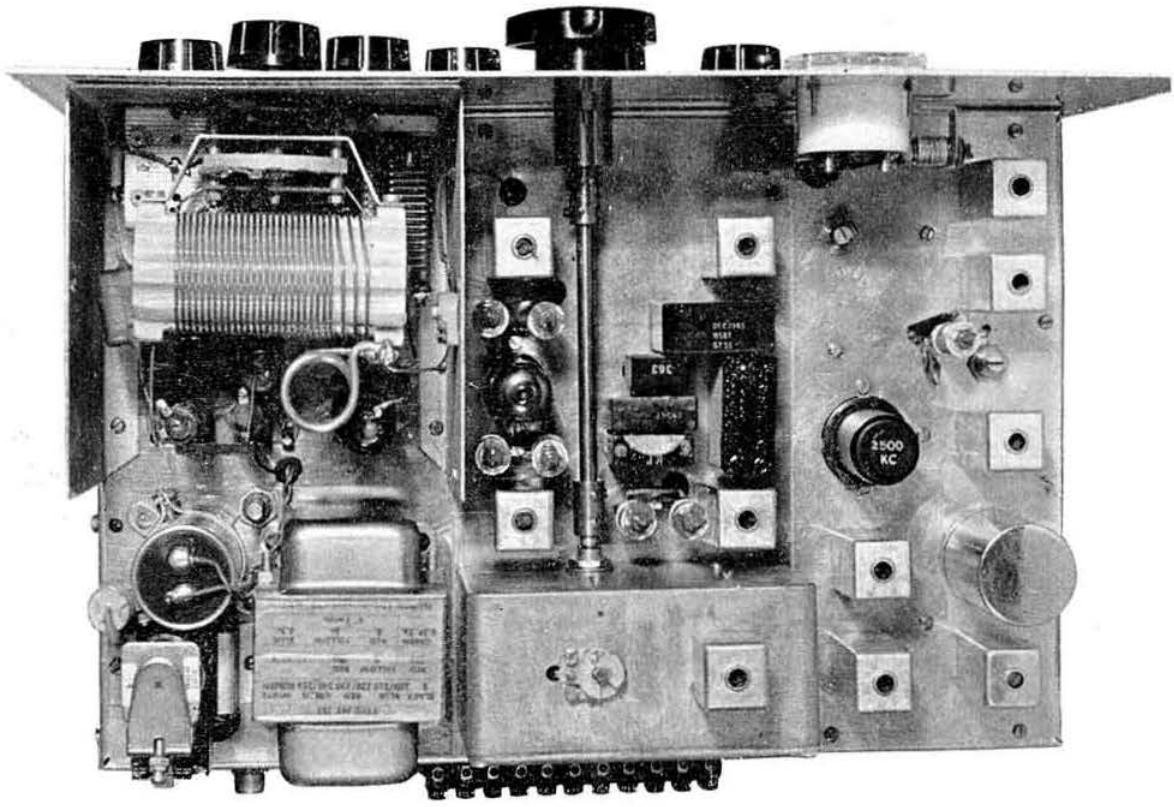
Another point in favour of the higher frequency bands is that up to 150 watts input may be used although a second car battery would probably be necessary. An input of 25 watts gives vastly better performance than 10 watts on 160 feeding an apology for an aerial.

On 2m, 10 watts to a clover leaf aerial is a good arrangement but the disadvantage of this band is that there is very little chance of working DX in the normal sense, although conditions to the Continent do sometimes open up.

Whether you feel like trying 2, 4 or 10, it is certain that a change from Grandad's band is overdue: there are 1970 kc/s of space waiting for you on 10, and when the sun spots come back you will be all ready to work some of the DX that comes along.

Now is the time to get down to the problem and start building something very worthwhile. If you want to be really well equipped build a multiband job or, better still, a transceiver. The transceiver approach seems to be the right way to do the job whether it is a single band or multiband rig and it can always be used at home to drive a lusty linear whether you use sideband or just ancient modulation.

G.R.J.



The G3MVZ Transistorized S.S.B. Transmitter

Described by Dr P. C. A. POSFORD, G3TFW*

THE circuit of this hybrid s.s.b. transmitter was devised and built as an exercise in the use of transistors with modern circuitry, although valves have been used in the driver and p.a. stages for comparable transistors of this power are still expensive. The transmitter, or exciter, covers 80m to 10m, but provision is made for Top Band if desired. The input is about 25 watts p.e.p., thus the exciter can be used " barefoot " on all bands and has sufficient drive for a small linear.

The designer had already constructed the G2DAF MK 1 exciter, which has given and is still giving excellent results, so it was decided to use this as a basis for the circuit. A comparison between the two will show a marked similarity, the crystal frequencies, in fact, being identical. Points of interest are the use of a mechanical filter, unit construction for ease of assembling and testing each section, and a free running carrier oscillator. A positive h.t. rail is used throughout to facilitate the construction of the power supplies. The basic test gear requirements are a reasonably accurate grid dip oscillator, a valve voltmeter and a frequency meter such as the LM14. An oscilloscope would be an advantage but it is not essential. Although all necessary circuit information is provided it is felt that the constructor should have a good basic knowledge of the problems of s.s.b. before building this circuit.

* " Braeside," Sanderstead Road, Sanderstead, South Croydon, Surrey.

† "Technical Topics," RSGB BULLETIN, December, 1963.

The Circuit

The *audio section* is conventional, using two OC83 transistors which were easily available, but it would probably be preferable to use more modern audio transistors. The response is tailored to provide a reasonably flat response between 500 c/s and 2·5 kc/s, with sufficient gain for a crystal microphone. The audio level is pre-set by means of the potentiometer between the two transistor stages.

The *carrier oscillator* is the W3JHR " Synthetic Rock " circuit,† suitably modified for this role, and has proved extremely stable. The carrier can be precisely placed in the passband of the following mechanical filter by means of the slug tuned inductor.

The *balanced modulator* consists of two OA79 germanium diodes, and critical adjustment of the parallel potentiometer allows very effective suppression of the carrier. Silicon diodes might provide even better suppression owing to their better front to back ratio, but suitable types were not easily available. The 30 pF Philips trimmer C11 allows stray circuit capacity to be balanced out as in the G2DAF exciter, and here some experimentation will be needed to find which side of the

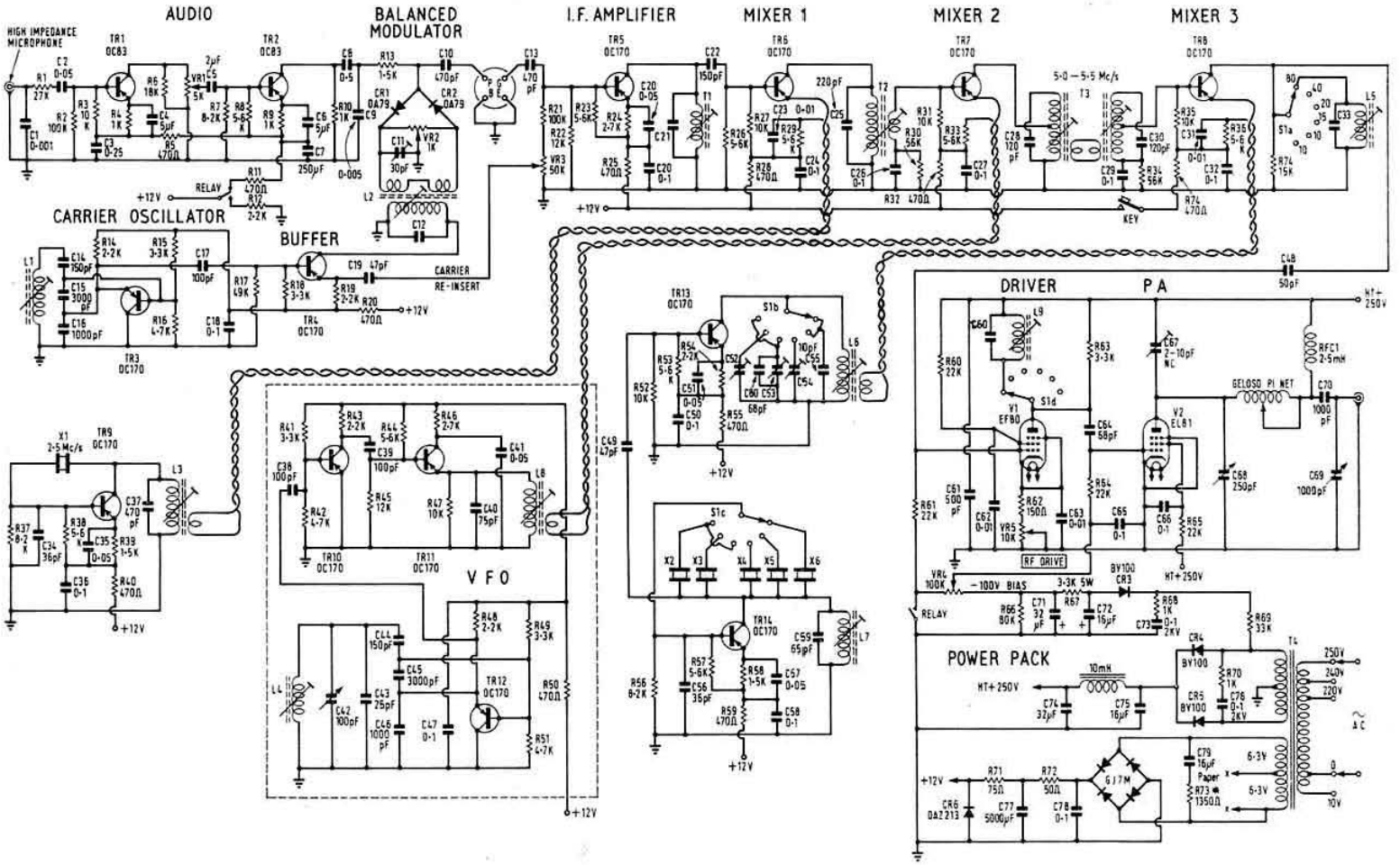


Fig. 1. The complete circuit of the G3MVZ s.s.b. exciter/transmitter, with provision for using a key. Each section is analyzed in the text.

L1, 465 kc/s i.f. transformer with secondary removed and primary stripped until on frequency.
L2, Repanco i.f. transformer XT27.
L3, 50 turns, 30 s.w.g. close wound on Aladdin former. 470 pF padding capacitor. Secondary, 7 turns at earthy end.
L4, 35 turns, 24 s.w.g., ⅜ in. diam. former.
L5, 9, Aladdin former with slug.
Pins 3 and 6, 3·5 Mc/s, 50 turns, 28 s.w.g., close wound. 60 pF trimmer + 220 pF fixed
Pins 4 and 6, 7 Mc/s, 25 turns, 28 s.w.g., close wound. 60 pF trimmer + 120 pF fixed.
14 Mc/s, 18 turns, 24 s.w.g., close wound. 30 pF trimmer + 25 pF fixed.
21 Mc/s, 14 turns, 20 s.w.g., close wound. 30 pF trimmer
28 Mc/s, 12 turns, 20 s.w.g., close wound. 10 pF fixed.
L6, 18 turns, 28 s.w.g. close wound, Aladdin former.
Resonate L6 on 23 Mc/s with 10 pF silver mica, on 16 Mc/s with 60 pF Philips trimmer, 9 Mc/s with 60 pF Philips trimmer and 68 pF s.m., and on 12·5 Mc/s with 60 pF Philips trimmer.
L7, 25 turns, 28 s.w.g. Aladdin former, close wound. 65 pF padder.
L8, 60 turns, 36 s.w.g. Aladdin former. 75 pF padder. Secondary, 8 turns, 36 s.w.g. at earthy end.
T1, Repanco IF Transformer XT 50.
T2, 75 turns, 36 s.w.g. close wound. 220 pF padder. Coupling, 25 turns, 36 s.w.g., at centre.
T3, 46 turns, primary and secondary centre tapped. 120 pF padders. Coupling link, 2 turns at cold end of each.

potentiometer provides the best suppression, 30 pF being nominal, the circuit symmetry being the deciding factor as to its eventual value.

The *mechanical filter* used is the Kokusai Type MF455 which is supplied with precise data for the particular sample, the exact frequency of the one used in this circuit proving to be 453 kc/s. Since the carrier oscillator is easily adjustable, however, this presents no problem. The passband at 6 db attenuation is 2·3 kc/s and the directions regarding interaction of the input and output circuits must be carefully followed by ensuring that the shield provided is fitted between the terminals of the filter, that the coupling leads are kept short, and that the stages before and after the filter are correctly placed to enable this to be carried out.

It may be argued that there is a severe mismatch at the input and output of the mechanical filter. Various impedance matching circuits were tried, but without any noticeable improvement, and in the interests of simplicity the circuit as described was used.

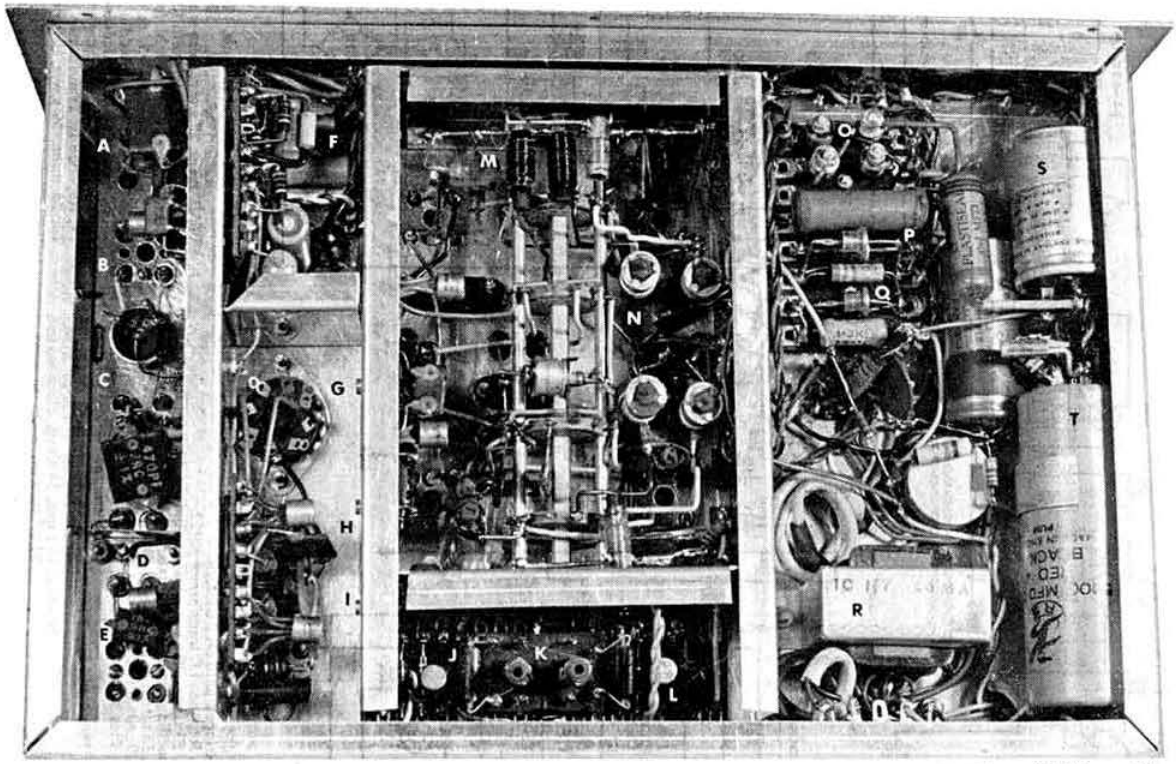
The *i.f. amplification stage* is necessary to provide a usable output from the mechanical filter for injection into the first mixer, as it will be noted that the transformer T1 is shunted by the transistor to reduce the *Q* of the tuned circuit thus preventing a spiky response.

The *first mixer stage* and *crystal oscillator* running at 2·5 Mc/s use OC170 transistors, the oscillator being link coupled via a low impedance winding to the emitter of the first mixer, the correct sideband appearing on 2045 kc/s at T2.

G2DAF lays great stress on the necessity of using balanced mixers in order to cancel spurious responses. With transistors the problem is not so serious due to the inherent low impedance providing a high degree of attenuation of all but the desired frequencies.

The *second mixer and v.f.o.* provides the 500 kc/s frequency coverage required, and again uses OC170 transistors throughout. The v.f.o., using the W3JHR circuit, has in addition a voltage amplifying stage to provide sufficient injection via the low impedance link coupling to the emitter of the second mixer, the output coil of L6 being damped by a 10 K ohms resistor to provide a reasonably constant output across the tuning range.

The v.f.o. is tunable over the range 2·955—3·455 Mc/s which, when mixed with the input frequency of 2045 kc/s, provides a tunable i.f. of 5—5·5 Mc/s which is selected by the wideband coupler T3 and fed to the third mixer.



Under-chassis view of the wiring. (A) Carrier oscillator and buffer; (B) L2; (C) Balanced modulator; (D) Mechanical filter; (E) I.f. amplifier; (F) Audio amplifier; (G) 2·5 Mc/s crystal; (H) 2·5 Mc/s oscillator; (I) Mixer 1; (J) Mixer 2; (K) T3, wideband coupler; (L) Mixer 3; (M) L9; (N) EF80; (O) 12V supply rectifier; (P) 250V supply rectifiers; (Q) —100V bias supply rectifier; (R) smoothing choke; (S) 250V supply smoothing capacitor; (T) 12V supply capacitor.

The wide band coupler T3, it will be noted, has both primary and secondary windings tapped, and is stagger tuned, the desired shape factor being obtained by careful adjustment of the link coupling and the resonant frequency of each coil.

The *third mixer* provides correct sideband output in each band in conjunction with the crystal oscillator and harmonic amplifier, OC170 transistors again being used throughout. No apologies are made for using the G2DAF crystal frequencies, suitable crystals still being available on the surplus market, and the reader is referred to the excellent articles by G2DAF appearing in the September, October and November, 1959 issues of the RSGB BULLETIN. Special mention should be made of L8 which is common to all bands thus simplifying the switching arrangements in relation to the low impedance link coupling. This coil was designed for optimum performance at the 23 Mc/s harmonic, loss of efficiency at the

lower frequencies being compensated by the larger available output.

For ease of operation broadband tuning is employed at the collector of the third mixer and the anode of the driver stage, and it will be noted that swamping resistors of 15 K ohms and 3·3 K ohms are used respectively. This assists in maintaining excellent stability in the stages concerned while still allowing adequate drive on 10m.

The *driver* and *p.a.* stages are conventional using an EF80 and EL81, the only point of note being that the h.t. for the p.a. is series fed through the pi-tank circuit.

The bias on the grid of the EL81 was adjusted to provide a standing anode current of approximately 25 mA, this stage being run in class A.

A 50 mA meter is inserted in series with the cold end of the r.f. choke and decoupled with a 0·01 μF capacitor. All resistors are ½ watt except for the EF80 screen dropping resistor which should be ½ watt, and the resistor used in the power supply which should be of suitable rating.

The *power supply* uses two BY100 silicon diodes for full-wave rectification of the 250 volt anode supply to the final stages, and one BY100 for half-wave rectification of the 100 volt negative bias supply. The 12 volt supply for the transistor section of the exciter is obtained by a bridge circuit from the 6·3—0—6·3 volt secondary windings of the mains transformer using four GJ7M diodes.

Transmit-Receive switching. The relay, which should have a high resistance coil of preferably 5000 ohms, can be energized from the 250 volt line with a suitable series dropping resistor to provide positive lock-in. This can be operated by a series " press-to-talk " switch, or alternatively a transistorized VOX circuit could be incorporated, but this was felt to be an unnecessary complication, the writer having tried both and preferring " press to talk."

Construction

The exciter is built in several sub-assemblies using miniature tag boards, each assembly being tested before being fitted into place under the 14 in. × 8½ in. × 2 in. chassis. The general layout can be seen from the under-chassis photograph. The v.f.o. is built into an Eddystone diecast box and placed on the top and at the centre rear of the chassis. Some care must be taken to line up the tuning condenser with the tuning drive on the front panel since the use of flexible couplings does not give the necessary degree of positive tuning and direct drive with brass coupling rod is preferable.

The reduction gearing is the Eddystone 50: 1 slow motion dial (type 843), but the rather large diameter dial could not be fitted on the panel and a smaller one was used. The tuning rate will be sufficiently positive for accurate netting.

The front panel of stipple grey finish is 15 in. × 8 in. and carries the microphone input socket, the controls, and a small Japanese meter for p.a. current. Engraving of the front panel was professionally done and adds much to the neat finish of the unit.

The aluminium case, also in stipple grey finish, is 15 in. wide, 8 in. high and 9 in. deep, which can be obtained together with front panel and chassis from suitable stockists. The small side ventilation slots are more than adequate and the unit will run with barely perceptible heat for long periods.

Additional 2 in. wide aluminium strips will be required for screening the stages under the chassis and the arrangement of the sub-sections as shown in the photograph should be strictly followed. All supply leads should be run close to the chassis edges and screened to prevent stray pick-up and leakage between sections.

The only surplus components used were the crystals, the exciter being built for approximately £40, the filter accounting for a quarter of this total. The exciter has been in use for some months at G3TFW on both 80, 20 and 10m, excellent reports having been received from many stations.

At G3TFW it is driving a pair of 5B/254M valves in passive grid configuration to approximately 180 watts p.e.p.

On Behalf of the Grass Widows

HAVING been married to a Radio " Ham " for over forty years I have come to the conclusion that " hams " are not quite as other men, and that certain qualities are necessary in dealing with them, such as the patience of a saint, the tact of a diplomat, a love of one's own company, and above all, a sense of humour. The " ham " bug attacks with its antenna and its victim will hereafter think only in terms of aerials; therefore your sense of humour must see that a 30 ft. pole erected bang in the middle of a pocket size handkerchief lawn is " just the job."

You are expected to take kindly to every available flat surface in the house being used as a parking lot for radio books, all open at the right places, and the tablecloth will invariably be covered with squibbles and doodles resembling a map of the underground.

If he is on the air it is impossible to get any " Ham " to a meal: he will listen to no voice calling nearer than Madrid.

I have managed over the years to pick up some of the jargon used by " hams," most of our guests being fellow borderline cases, and known only by letters and numbers. For instance, I no longer think there is something wrong with my cooking when they are discussing " feed-back." The moving up and down of K.C's. to get out of the mush is no longer Dutch, but in spite of all the talk of fine business and 73 (or 88), what really denotes the addict is the mobile stage, when he can no longer venture outside without his radio so that he can contact the " ham " he is visiting (he will be visiting no one but a " ham ") to tell him when he leaves the house, when he turns a corner, or goes over or under a bridge, etc; thus his fellow victim knows exactly where he is until he is right outside the house. Of course, in this way one could say we always know where our men are.

These are but a few of the hazards of life with a " ham "; perhaps we are no worse off than the grass widows of yachtsmen, golfers and fishermen; at least we have plenty of time to study the " circuit diagrams " in the knitting books.

Mrs W. Willis, XYL of G6OU

Special Events Stations

The Stoke-on-Trent Amateur Radio Society will be operating a Jamboree-on-the-air station using the call-sign **GB3NNS** for the North Staffordshire Scouts on October 16 and 17 from the Kibblestone Camp near Stone, Staffordshire.

The Uxbridge Radio Society will be operating **GB3UBB** on behalf of the Uxbridge Boy Scouts during the Jamboree.

From the Headquarters of the 10th Great Yarmouth Boy Scout Group **GB3GBS** will be on the air operated by members of the Great Yarmouth and District Amateur Radio Group. Bands from 160m to 10m will be used with all contacts being QSL'd either by the RSGB Bureau or G3SEM, 10 Avenue Road, Gorleston, Great Yarmouth, Norfolk.

A Transistorized Frequency Marker

By A. S. CARPENTER, G3TYJ *

STANDARD frequency marker units have been described many times previously, some complex, and some simple in design. They consist basically of an r.f. oscillator controlled by a sub-standard crystal operating on 100 kc/s, 500 kc/s, 1 Mc/s or some other convenient frequency. The oscillator circuit is arranged in such a manner that it is prolific in harmonics and by the use of these harmonics, a spectrum of frequencies having an error equal to the accuracy of the prime frequency becomes available.

In many instances additional facilities are incorporated in the marker unit. Of these, the most useful is a supplementary oscillator which divides up the space between the main markers thus allowing more accurate interpolation. Of almost equal utility is the ability to tone modulate the markers, so aiding their identification.

General Description

By using transistors in the marker to be described, not only is space saved and ease of portability assured, but due to the freedom from heat generated by valves, the long term accuracy is substantially increased.

In this unit, the sub-standard crystal operates on a frequency of 500 kc/s, and this allows the use of an easily obtainable transformer as the phase shifting element. On its own, this oscillator will provide markers at 500 kc/s intervals to well beyond 30 Mc/s.

A secondary oscillator operating on 50 kc/s is also fitted, as well as a tone modulator.

* 15 Portway, Frome, Somerset

Circuit Description

The circuit of the unit is shown in Fig. 1.

The 500 kc/s sub-standard crystal oscillator circuit comprises TR1 and the transformer T1. In many respects this arrangement is similar to that shown on p. 428 of the RSGB *Amateur Radio Handbook*. The transformer used in position T1 must fulfil certain requirements, and while other transistor i.f. transformers may work, the use of the type specified is strongly advised. This is of pot core construction, and it is doubtful if transformers of the more usual open construction would have sufficient magnetic coupling between windings to provide satisfactory operation. The crystal itself is 10X type obtainable from the supplier named in the parts list.

TR2, in association with T2, is a simple transformer-coupled audio oscillator. The transformer is the type normally used as a driver transformer, and has a ratio of about 5 : 1. The Weymouth LFDT4 would appear to be suitable. The r.f. sub-standard oscillator is modulated through the capacitor C3.

The frequency and output from the oscillator is controlled

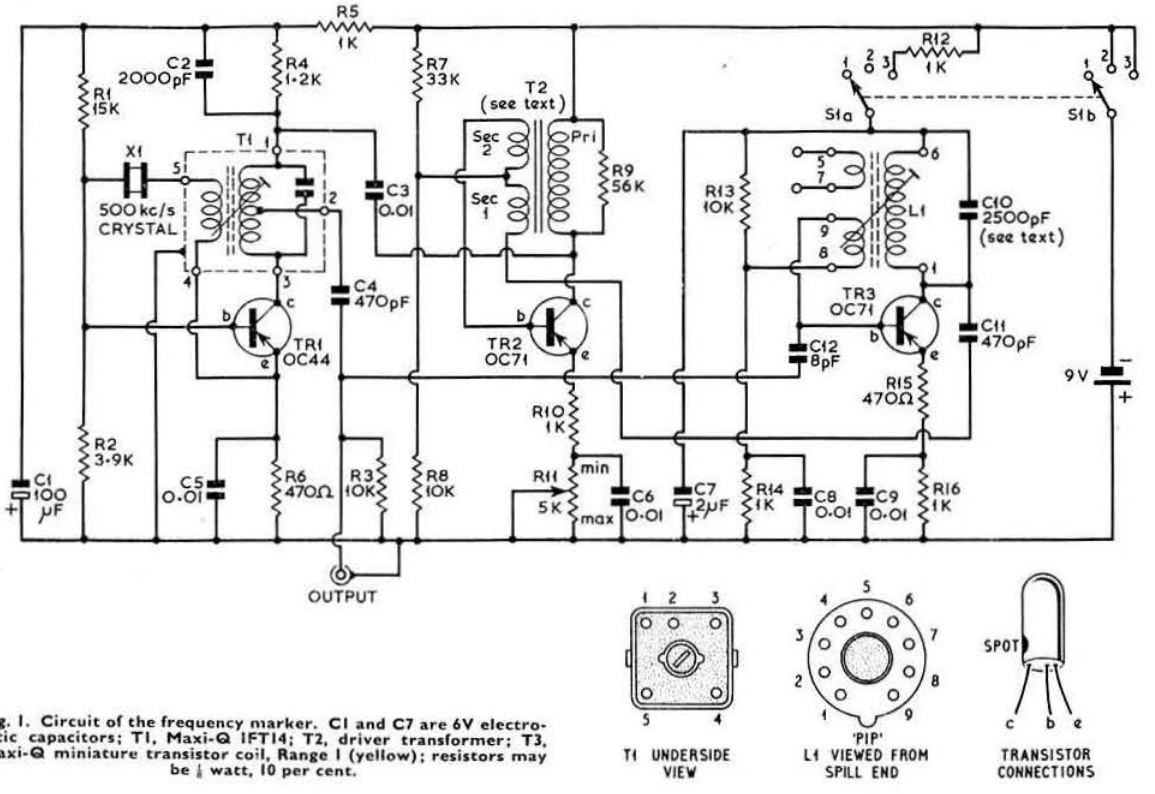


Fig. 1. Circuit of the frequency marker. C1 and C7 are 6V electrolytic capacitors; T1, Maxi-Q 1FT14; T2, driver transformer; T3, Maxi-Q miniature transistor coil, Range 1 (yellow); resistors may be ½ watt, 10 per cent.

by the potentiometer R11. As this is rotated from minimum to maximum, the frequency varies between approximately 350 c/s and 650 c/s. Oscillation ceases when R11 is at maximum. As the slider of R11 is run through its range, not only does the frequency vary, but the waveform improves—becomes more of a sine wave—but at the expense of output level. R11 may be used as an audio OFF switch by rotating it to " max."

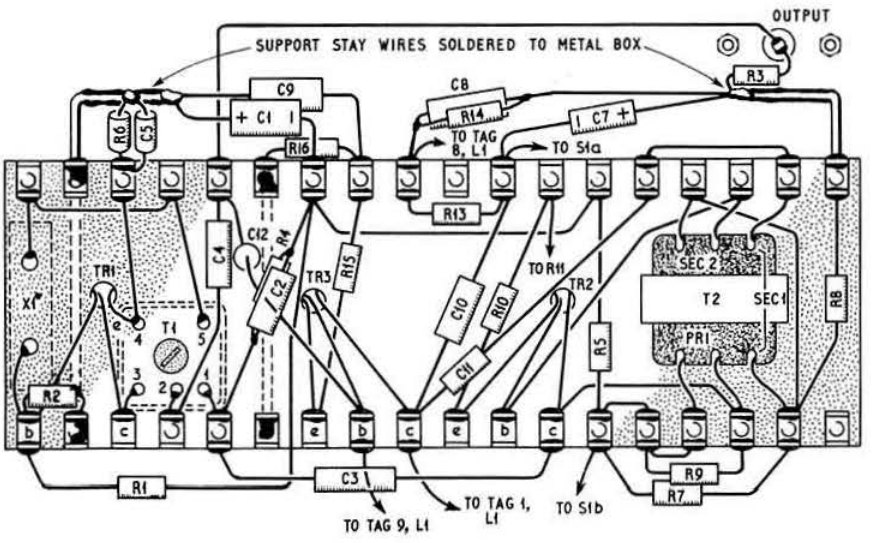


Fig. 2. The wiring of the underside of the tag board, slightly expanded and laid flat for clarity.

The 50 kc/s oscillator consists of TR3 and its associated circuitry. Originally a relaxation oscillator was employed, but this was unsatisfactory and the transformer-coupled oscillator shown was eventually fitted. When it was decided to change the oscillator type, the source of a ready made transformer for 50 kc/s appeared to be a minor problem. It was found that the Maxi-*Q* transistor coil, range 1 (yellow), performed in a satisfactory manner. The tuned winding inductance of this coil is 3000μH, which, with a parallel capacity of 2500pF, resonates at 50 kc/s. Slight variation of frequency is possible by adjustment of the core, although the fitting of a variable emitter resistor may prove more satisfactory. As an alternative, a Maxi-*Q* transformer type BFO/2/85 kc/s may be tried. This will resonate at 50 kc/s with 1200pF parallel capacity. This transformer, however, has not been tested in the prototype marker.

There is of course no reason why the interpolation oscillator should be on 50 kc/s. It could as well be on 100 kc/s if this frequency is preferred. If this is the case, then reducing C10 to 850pF will place this oscillator on 100 kc/s, or thereabouts.

Construction

The unit is constructed on a Radiospares miniature 18 way tag strip. While the writer employed an available tin box in which to house his unit, a very suitable case would be an Eddystone die-cast box of sufficient dimensions to house the tag board. For ease of assembly and service, the tag board should be fitted to the lid of the box by spacer bolts.

Layout details are shown in Fig. 2 and apart from the fixing of T1 no particular explanation should be required. T1 is mounted by drilling the tag board to pass the five pins which project from it. The screening can has its fixing lugs bent *outwards* and over these are passed two stiff wires threaded through holes made in the board for this purpose. This method allows the screening cover to be removed without having to remove the transformer, or disturb the wiring to it.

The audio oscillator transformer requires no clamp, being retained by soldering the lead-out wires directly to the tags shown in the illustration. T3 is mounted directly on the lid of the box since this provides easy access to the core of this component.

The general construction and placement of components in relation to the case itself is shown in Fig. 3.

The windings on T2 may not be positioned identically with those shown in Fig. 2 for the reasons already stated. The transistors are positioned with their shells above the board, and their leads should, of course, be fitted with sleeving.

Testing and Setting Up

While not essential the waveforms of the various oscillators should be examined on an oscilloscope soon after power has been applied to the device. Particularly is this useful when adjusting the potentiometer associated with the audio oscillator, for then an accurate balance between waveform and output can be achieved. However, such checks are not absolutely vital to the setting up of the unit.

In fact it is the audio oscillator TR2 which should be tested first, for, if the transformer is not phased correctly,

(*Continued on page 652*)

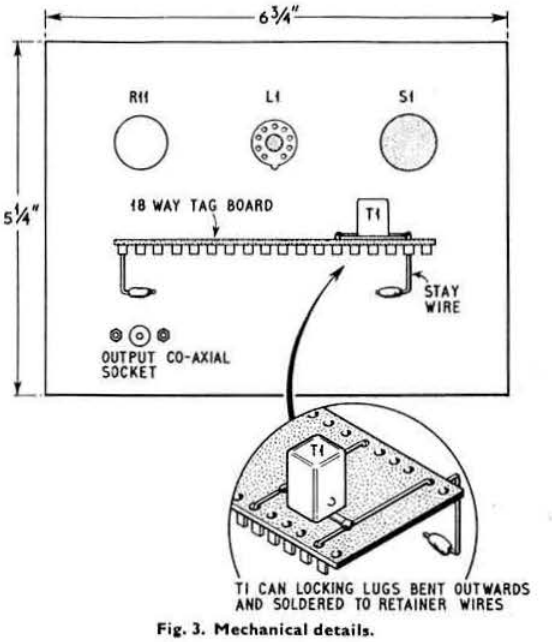


Fig. 3. Mechanical details.

10 WATT TRANSISTOR TRANSMITTERS FOR 1·8 – 2·0 Mc/s

Designs suitable for Mobile, Portable or Fixed Station operation

By F. C. JUDD, A.Inst.E., G2BCX * and E. A. RULE, G3FEW†

THE increasing availability of r.f. power transistors has made it possible to produce transmitters which are particularly suited to mobile and portable working by virtue of their remarkably high power output to total power input efficiency percentage. Gone are the days when a fair proportion of the input power was for the sole purpose of heating the valves. With transistors, nearly all the power is made to do useful work in terms of radiation.

In the designs to be detailed, the p.a. efficiency is even higher than that normally associated with transistorized designs, for the writers have employed a technique which, although not new in itself, is not commonly used in r.f. applications. The result is a substantial increase in overall efficiency almost to the point where, on the face of it, power losses are non-existent. Naturally, the writers do not claim to have achieved, in a radio sense, the alchemists dream—unfortunately.

Since the major improvements in efficiency occur in the p.a. stage of the transmitters, the design and operation of these are covered first.

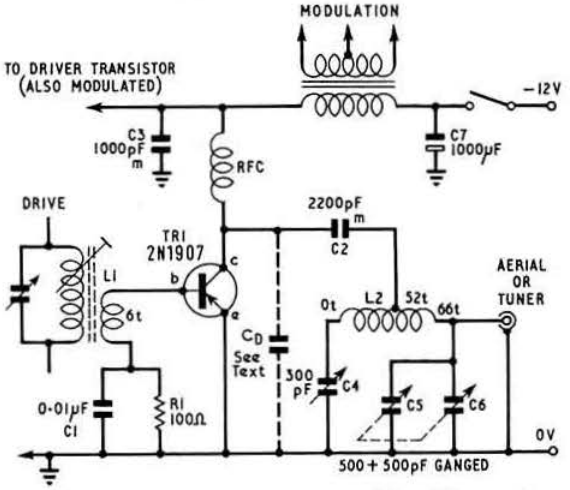


Fig. 1. The G2BCX transistor r.f. power amplifier. L2 is wound on a 1½ in. diameter former.

The G2BCX R.F. Power Amplifier

The circuit of the improved r.f. amplifier is shown in Fig. 1, which, at first sight, may seem to be quite ordinary.

As will be seen, the r.f. drive is applied to the base of the transistor via the low impedance winding, L1, the earthy end of which is returned to the earth line through the CR network, C1, R1. Through the action of C1, R1, the negative half cycle of the drive switches the collector current of the transistor from " full on " to " fully off." *Thus in this case, the transistor has to be regarded as a switch which turns the d.c. on and off at a rate equal to the frequency of the drive.*

The output at the collector will appear as very large amplitude pulses as shown in Fig. 2a, but, due to the flywheel action of the tuned circuit, L2, C4, the " missing " portions of the waveform will be restored. In fact, and provided that L2, C4 are correctly proportioned, the output will be a sine wave with a fairly low harmonic content *at the actual aerial terminal*. Particularly note the words in italics.

The load value of the transistor is a function of the desired power output and can be found from $R_L = \frac{0{\cdot}5\ V_{ce}^2}{P_o}$ where R_L is the load resistance, V_{ce} the collector d.c. voltage, and P_o the r.f. power output. Consider an r.f. output of 10 watts at a collector potential of 12V, then substituting we have $\frac{0{\cdot}5 \times 12^2}{10} = 7{\cdot}2$ ohms. Such a low value of load resistance is not really a practical proposition when using a conventional parallel tuned circuit between the collector and the d.c. supply, and therefore an impedance transforming arrangement has to be employed.

The pi-network is ideally suited for the purpose since it will (a) effect the requisite load transformation for the collector, (b) with suitable constants resonate at the desired frequency, (c) provide matching to a low impedance aerial system, or aerial tuner and (d) act as a filter for harmonics generated by the pulsing action of the p.a. transistor.

Operation and Setting Up

The pulses developed at the collector should be of a duration of approximately a tenth of one cycle and have an

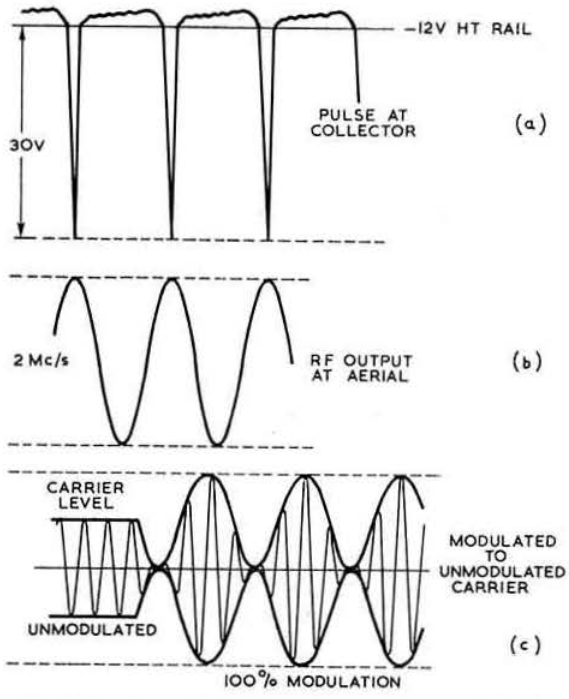


Fig. 2. Waveforms obtained from the transistor p.a. of Fig. 1.

*174 Maybank Road, London, E.18.
†58 Courtland Avenue, London, E.4

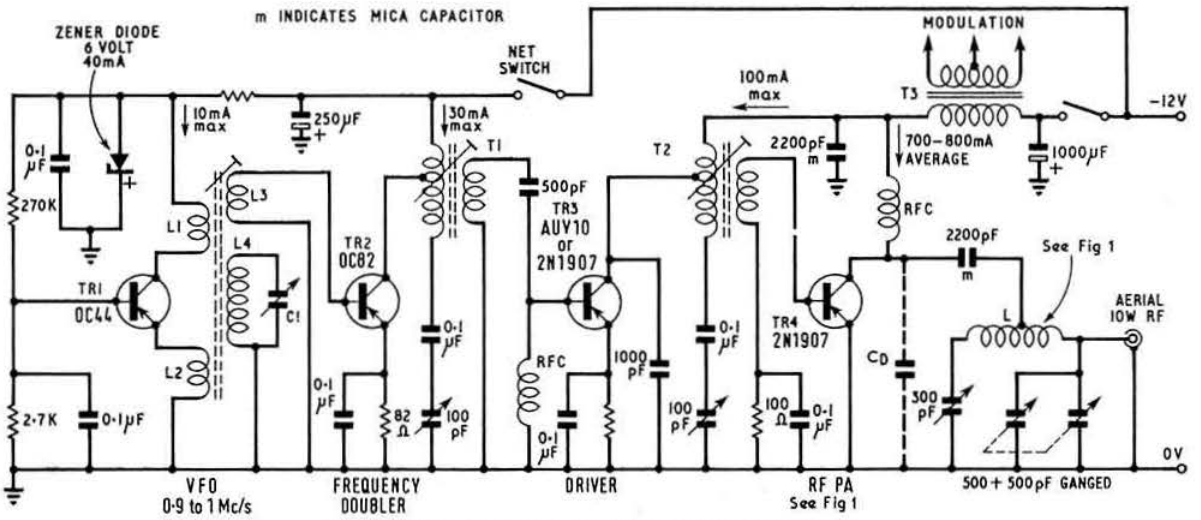


Fig. 3. The v.f.o. and driver stages of the G2BCX transmitter.

amplitude of 25 volts for an output of 9 to 10 watts with a 12V supply. It is most important that the pulse is generated with a clean waveform as any distortion, or insufficient amplitude due to damping—stray capacity, low Q in the tuned circuit, etc.—will reduce the r.f. output.

Under no circumstances should the p.a. tank circuit be tuned without the output being loaded.

Preliminary tests should be carried out with an oscilloscope. The Y amplifier on an average oscilloscope may not be capable of displaying the collector pulse in a satisfactory manner, for this amplifier must have a frequency response to at least four times the operating frequency. In this case, this requires that the Y amplifier extends to about 8 Mc/s without appreciable overshoot. Where difficulty is encountered, the pulses should be fed directly to the Y plates via an isolating capacitor of not less than 0·1µF.

It is essential to verify that the transistor is operating in the correct manner, for operation in any other mode can produce noise together with/or harmonics of considerable amplitude which could damage the transistor. It is also equally essential to include a large value capacitor (1,000µF) across the h.t. line immediately after any on-off switch to prevent large d.c. pulses being developed by inductive parts of the circuit such as the modulation transformer secondary, r.f. chokes, etc. Pulses of up to 500V could be produced by switching without the protection of such a condenser, and this might well result in the destruction of the p.a. and other transistors in the transmitter.

Efficiency

The usual method of measuring the d.c. power input to p.a. stage is to multiply the current taken by the voltage applied. For example, a class C valve p.a. may have an anode current of 40mA at an applied voltage of 250V, in which case the d.c. input would be 10 watts. Under these conditions, the same valve may deliver 6–7 watts of r.f. to the load indicating an efficiency of 60–70 per cent.

Due to the pulsed nature of the output from the transistor p.a. being described, similar calculations will not apply for an average meter will not respond to the *peak* current taken by the transistor. For example, while the p.a. may be found to be delivering 10 watts into a load, the measured current input from a 12V supply may be as low as 700mA on a meter indicator, and thus the measured input would be 8·4 watts. On the face of it, one appears to be getting something for nothing, but it is the indicated current which is in error. Indeed, if the indicated d.c. input is high, this could well mean a poor pulsing action by the p.a. transistor.

The actual efficiency of the p.a. can be expected to be impaired slightly by the resistance of the secondary winding of the modulation transformer, and that of the r.f. choke. Both of these items must have a low d.c. resistance, that of the r.f. choke not exceeding 6 ohms, but preferably less.

Notes on the G2BCX Transmitter

The circuit of the complete transmitter is shown in Fig. 3 to which the following notes relate.

(i) Approximately 6 watts of audio power are required to modulate the 2N1907 p.a., and this can be obtained from a transistorized modulator employing two OC25s in class A push-pull.[1]

(ii) The v.f.o. TR1 is of comparatively simple design, but, is nevertheless, sufficiently stable even under mobile conditions. The v.f.o. operates between 0·9 Mc/s and 1 Mc/s and therefore requires the following stage, TR2, to be a frequency doubler.

(iii) The driver stage is also modulated to ensure modulation up to 100 per cent.

(iv) If an AUY10 is used in place of the 2N1907 in the p.a., the capacitor shown dotted, C_D, may be required. Excessive off-tune noise can suppressed by means of this capacitor which should have a value of the order of 1,000pF (mica), but its use will reduce the r.f. output by about 10 per cent (use of the AUY10 in this circuit is not recommended).

(v) The pi-network p.a. tank coil, L, should be wound with at least 18 s.w.g. enamelled wire, or with a comparable diameter Litz wire, in order to maintain a high Q.

(vi) An r.f. thermocouple ammeter measuring up to 1 amp, and a 40 to 70 ohm carbon resistor capable of dissipating 10 watts without undue heating will be adequate for dummy load testing.

If the transmitter is functioning correctly, it should be possible to produce *an r.f. power of 10 watts* into the load, while a d.c. meter in the p.a. indicates between 700mA–750mA with a 12V supply.

(vii) To check for TVI, the transmitter has been operated at 10 watts output, fully modulated, into a vertical aerial some 20 ft. from a television receiver. No trace of patterning or sound breakthrough was detected on any TV channel.

THE G3FEW TRANSISTOR TRANSMITTER

This section deals with a completely transistorized transmitter devised by G3FEW and which employs a pulsed r.f. stage and covers 1·8 Mc/s–2 Mc/s. The unit is complete with its own modulator. A mains power pack, employing electronic stabilizing, is also described for when the unit is used under fixed station conditions.

The R.F. Section

The circuit of the G3FEW transmitter r.f. section is shown in Fig. 4.

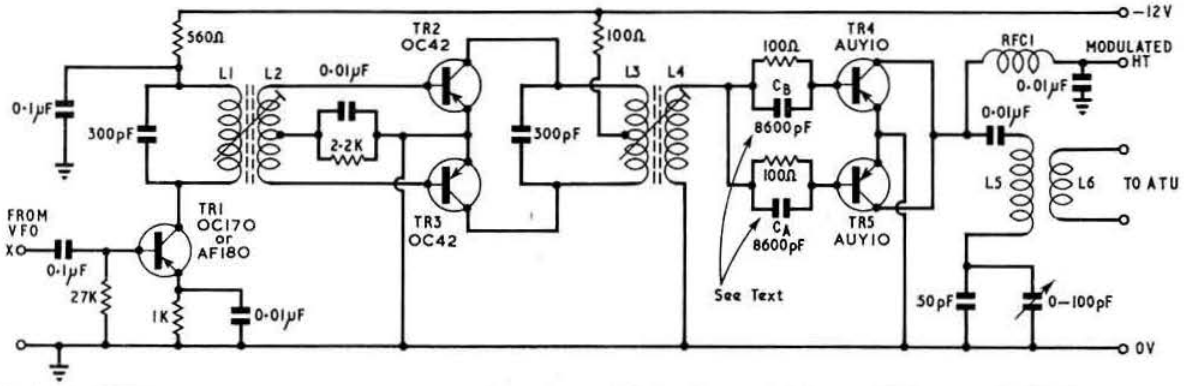


Fig. 4. The G3FEW transistor transmitter. L1, 30 turns; L2, 5 + 5 turns; L3, 15 + 15 turns, L4, 4 turns. L1-4 are wound with 28 s.w.g. enam. copper wire on ½ in. diameter slug-tuned formers. L5, 100 turns, 20 s.w.g. enam., ½ in. diameter with iron dust core; L6, 40 turns, 20 s.w.g. enam. and L7, 4 turns, 20 s.w.g. enam. on 1½ in. diameter ribbed former.

TR1, OC170, operates as a class B amplifier and requires an input of 3 volts from the v.f.o. The collector of this stage is connected across the whole of the winding of L1, and this has the effect of reducing the *Q* and providing a broadband transformer effect. The secondary winding, L2, is coupled to a pair of OC42s also operated in class B and connected in push-pull, the output of which is of the order of 150mW. As with TR1, the collectors of TR2 and TR3 are connected across the whole of the winding of L3, and for the same reason, namely to produce a broadband effect. The coupling winding, L4, feeds the base circuits of TR4 and TR5, which are a pair of AUY10s connected in parallel, and the bias for each of these transistors is developed across individual resistors in each base lead, one in parallel with C_A and the other in parallel with C_B. This bias should be approximately 0·7 volts positive.

As with the G2BCX p.a., due to the low saturation voltage obtained with the transistors in the p.a. stage, this can be regarded as a 2 Mc/s switch, the collector waveform of which will be as shown in Fig. 2. The pulses produced will have a peak current of about 1 amp at 12 volts depending on the amount of drive, and the duration of the pulse. Again it is stressed that a moving coil instrument will not indicate the correct peak input current, and that investigation of the operation of the p.a. should be in the manner previously described.

No particular difficulties should be encountered with the circuit of Fig. 4 when using the components specified, and a 12 volt supply. However, the greatest care should be taken if any attempt is made to increase the input power, and under such circumstances it is vital to measure the peak input power, for, to exceed the peak collector rating, even for the duration of one pulse, could be fatal to the p.a. transistors.

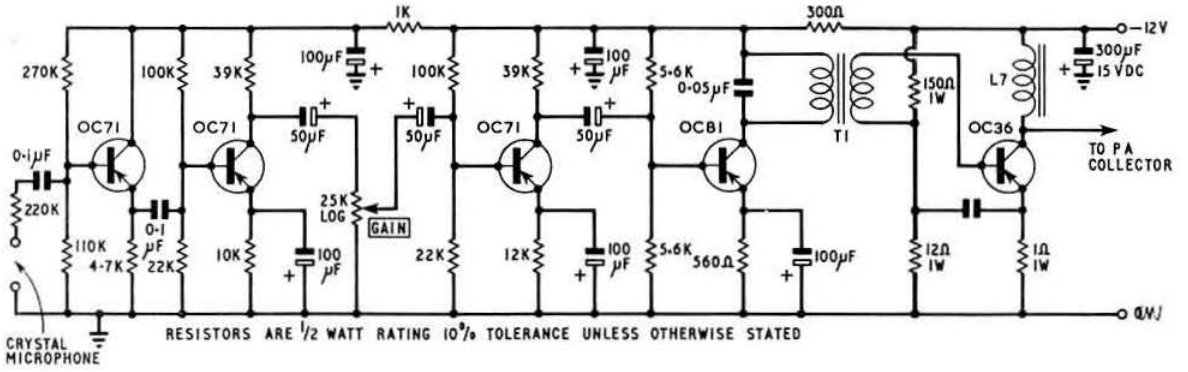


Fig. 6. A modulator for the G3FEW transmitter. T1 is a standard car radio driver transformer, and T2 is a similar output transformer.

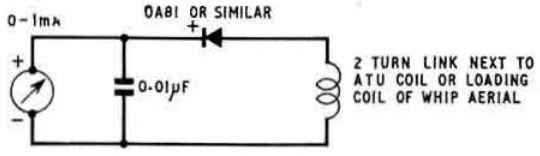


Fig. 5. Simple r.f. meter for tuning.

While the p.a. tank circuit may appear unconventional, this arrangement has been employed since it provides maximum power transfer from the p.a. to the aerial circuit. Furthermore, it is not critical in operation.

As with the G2BCX p.a., the p.a. of this transmitter should not be tuned without a load. The p.a. transistors only draw the correct operating current when the circuit is tuned to resonance and loaded, and without such a load, dangerously high currents can be passed by the collectors of the p.a. transistors, especially if the circuit should happen to be operated at greater than 10 watts input. The best method of tuning is to employ the simple r.f. indicator shown in Fig. 5, coupled either to the a.t.u. or the loading coil of the whip where such an aerial is used. Simply tune the transmitter for maximum r.f. output.

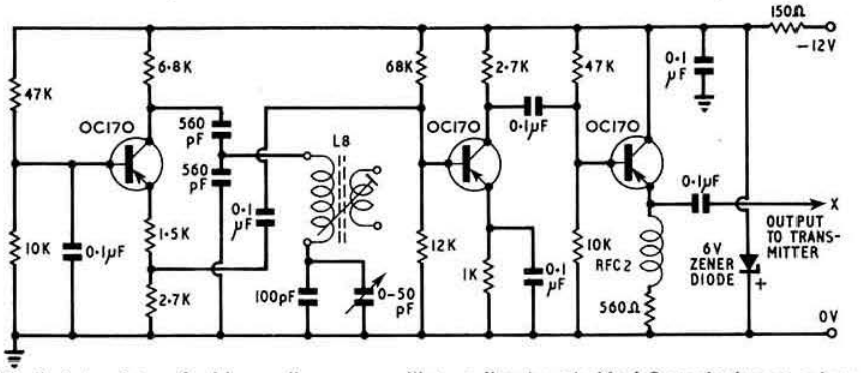


Fig. 7. A transistor v.f.o. L1, a medium wave oscillator coil such as the Maxi-Q standard range, colour coded red.

The transformers L1-L2 and L3-L4 should be tuned so as to provide constant drive over the whole band. Suggested frequencies are 1850 kc/s and 1950 kc/s which have been found satisfactory in practice. Once these are set, tuning the transmitter reduces to setting the v.f.o. to the correct frequency, and then tuning the p.a. for maximum output.

Modulator

Unlike the G2BCX design, in the G3FEW transmitter, modulation is only applied to the p.a. stage.

The audio modulator is a single OC36 which develops some 4 watts of audio which is quite sufficient to fully modulate the AUY10s up to an r.f. output of 8 watts.

The circuit of the speech amplifier stages and final modulator is shown in Fig. 6. The input of the amplifier is arranged for a crystal microphone, but a moving coil, or other low impedance microphone may be used simply by omitting the first OC71 stage. The driver transformer, T1, and the output choke, L1, are standard car radio driver and output transformers. The frequency response of the amplifier has been arranged so that there is a fairly sharp fall off below 300 c/s, and above 2500 c/s.

Variable Frequency Oscillator

The circuit of a transistorized v.f.o. suitable for driving this transmitter is shown in Fig. 7. In this an OC170 is used in a Clapp derived circuit followed by an untuned buffer amplifier and an emitter follower. No drift is detectable with a Zener diode stabilized supply which provides 6 volts for the oscillator. On "stand-by" the oscillator supply can be switched with the rest of the transmitter.

Mains Supply

The circuit of a suitable supply to allow the transmitter to be operated under fixed station conditions and from a.c. mains is shown in Fig. 8. This circuit features electronic stabilizing and smoothing which eliminates the need for large chokes and smoothing capacitors, while at the same time providing protection against overload and short circuits.

The output voltage is constant for currents up to 2 amps, after which the terminal voltage falls rapidly. Construction is relatively unimportant so long as the output transistor is mounted on a heat sink made from 16 s.w.g. material and has an area of not less than 49 sq. cm. Almost any power transistor may be employed so long as it has a current rating of at least 5 amps.

Conclusion

Both of the transmitters described have been in operation for over a year and have given highly satisfactory service under mobile, portable and fixed station operation.

The high efficiency of these units has a pronounced effect on signal strength reports, especially when comparisons are made between valve transmitters and these units operating into the same aerial system.

Development of pulsed p.a. stages is being continued, and it seems likely that push-pull stages for up to 50 watts or more at frequencies of at least 30 Mc/s should be possible. In relation to this, however, it should be mentioned that whilst transistors for such applications are still expensive, those employed in the transmitters described in this article are readily available at reasonable prices.

References

[1] *Survey of Transistors for Amateur Use*, by T. D. Towers. Available from Newmarket Transistors Ltd.

[2] "Transistor Transmitters for 8 Mc/s," *Mullard Technical Communications*, Vol. 7, No. 62, January 1963.

[3] "8 Mc/s and 30 Mc/s H.F. Amplifiers," Mullard New Products Information TP807, 1964.

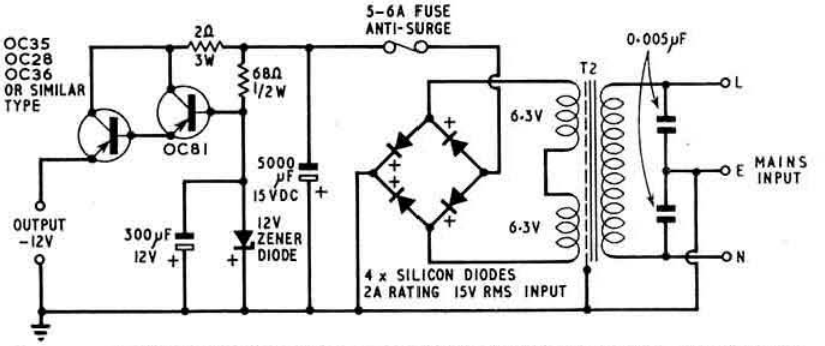


Fig. 8. Power supply with electronic smoothing and stabilizing for fixed station use. T1, mains transformer with 12 volt 2 amp or two 6·3 volt 2 amp winding in series.

Single Sideband

By G. R. B. THORNLEY, G2DAF*

THE most useful method of testing a single sideband transmitter is with a two-tone input signal. A linear amplifier driven with two equal amplitude frequencies spaced approximately 1 kc/s or 1·5 kc/s apart will produce a modulation envelope with a repetition rate equal to the difference between the two frequencies. If the oscilloscope time-base is set to a speed that is a sub-multiple of the two-tone difference, a steady waveform will result as shown in Fig. 1. From inspection of this envelope it is possible to determine the degree of amplifier linearity, to make appropriate adjustments if necessary, and to load correctly to obtain maximum power output without flat topping. Additionally a two-tone driving source is useful if it is required to drive the transmitter for an appreciable period of time—for instance during the investigation of a TVI complaint, or for the purpose of r.f. output power measurement.

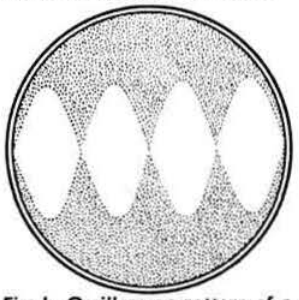


Fig. 1. Oscilloscope pattern of a two-tone test signal.

In practice it is possible to produce a two-tone envelope by inserting carrier and using *one* audio frequency fed from the audio signal generator into the microphone input socket. However, many existing exciters do not have provision for " carrier injection " and under these circumstances it is necessary to simultaneously feed *two* sine wave audio frequencies—displaced by the required amount—into the microphone input socket. As the audio outputs of the generator do not have to be varied, two simple fixed frequency a.f. oscillators will do all that is required. A low cost, compact unit can be easily home constructed in a few hours using transistors and powered by a 12 volt dry battery supply. As an item of test equipment a two-tone test oscillator is a " must " for every sideband operator. A suitable design—due to K2ENN and originally published in a 1963 issue of *QST*—will now be described in detail.

Transistorized Two-tone Test Oscillator

The circuit shown in Fig. 2 consists of two transistorized RC phase shift oscillators, one at 1000 c/s and the other at 2000 c/s. The outputs are combined through C1 and C2 and fed to the output-level potentiometer R1. It will be noted that the two oscillator circuits are identical (except for RC values) and both use a common emitter amplifier TR1 and TR2 and a three-section RC phase-shift network. This network shifts the phase of the collector signal by 180 degrees and applies it back to the base. Since the signals at the base and the collector are 180 degrees out of phase to begin with, a loop phase shift of zero occurs at the frequency at which the network produces 180 degrees of shift. The attenuation which the signal suffers in passing through the phase-shift network is recovered by the gain of the amplifier. Thus when the loop gain is unity oscillation occurs.

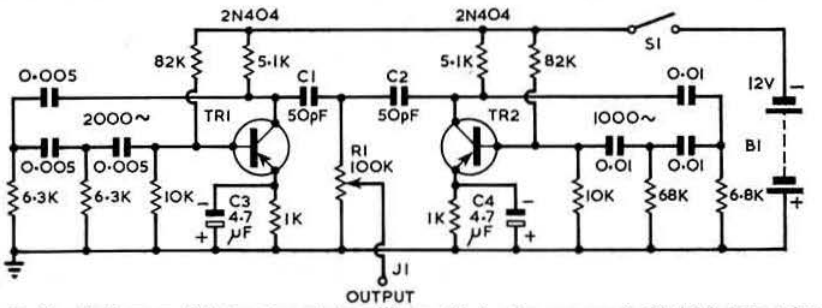


Fig. 2. Circuit diagram of the two-tone test oscillator. C1, 2, mica or ceramic. C3, 4, 4·7μF Tantalum, 3 volts wkg.

All components may be mounted in a box 3½ x 2½ x 2 in. with the component layout following the circuit diagram. It is recommended that RCA type 2N404 transistors are used and that the two emitter bypass capacitors of 4·7 μF are not made any smaller. The values used maintain equal output signals from both oscillators.

To place the unit in operation connect up a 12 volt battery ensuring that the positive terminal goes to chassis earth and the negative terminal to the on/off switch. VR1 will allow smooth adjustment of the output signal from the millivolt level to approximately one volt peak-to-peak. This should be adequate for the usual microphone input level. In the event of more output being required, increase the value of C1 and C2 keeping the two equal at all times.

Using the Oscillator

Having connected the output of the two-tone oscillator to the microphone input, tune up the transmitter with a non-inductive dummy load and couple some of the output r.f. to the vertical deflection plates of the oscilloscope and adjust the horizontal time-base to give a steady modulation envelope waveform. The transmitter should now be adjusted for maximum power output without flat-topping of the waveform on the oscilloscope.

The pointer of the anode current meter will remain stationary and give a steady reading; this current in amps multiplied by the h.t. supply voltage is the d.c. power input to the linear amplifier in watts. A thermocouple or hot wire r.f. ammeter placed in series with the dummy load will indicate the mean r.f. current flowing in the load; this value squared and multiplied by the resistance of the dummy load equals the mean power output. Mean power output divided by the d.c. power input and multiplied by 100 is the amplifier two-tone efficiency expressed as a percentage.

To summarize:

D.C. Power Input = h.t. voltage × anode current.

Mean Power Output = $I^2 \times 75$ (this assumes a load of 75 ohms)

$$\text{Efficiency} = \frac{\text{mean power output}}{\text{power input}} \times 100\%$$

The p.e.p. input can also be taken directly from the anode current meter reading by removing the two-tone input and driving the transmitter with a single-tone input (alternatively by inserting carrier) to the *same* maximum envelope deflection as previously recorded on the oscilloscope. The new anode current meter reading in amps multiplied by the h.t. supply voltage is the p.e.p. input in watts. The p.e.p. r.f. output is twice the mean r.f. power output previously

(*Continued on next page*)

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Simple Circuit Modifications to the KW2000

By T. P. DOUGLAS G3BA*

THE KW 2000 is a deservedly popular item of British s.s.b. equipment whose performance generally is first class by any standard and is an instrument which compares favourably with similar but much more expensive equipment which has to be imported from abroad. Of course, if one sets one's mind to it there will always be some point or other which can be found fault with dependent on what aspect of performance is considered to be important to the operator. I for one have no wish to criticize the general functioning of this little transceiver which is most satisfactory, but for those owners who may have thought that the quality of the speech both on transmit and receive was perhaps a little too harsh, then possibly the following observations and simple modifications might be of some interest.

The KW 2000 uses a Kokusai 2·1 kc/s nominal filter and, with a relatively limited band width such as this, it is most undesirable that any further limitation of the audio frequency response should take place elsewhere in the transmitter or receiver. If both the carrier crystals have frequencies which are correctly placed in respect to the mechanical filter passband, i.e. about 350 c/s at the maximum from the beginning of the flat part of the filter characteristic, then there should be an overall speech frequency response of approximately 300 c/s to 2·9 kc/s as the 2·1 kc/s nominal Kokusai filter has in practice a useful bandwidth of close on 2·6 kc/s. Whilst checking the KW 2000 at G3BA with an audio generator to determine its overall audio response it was noted that whilst the lower sideband has a passband of 700 c/s to 2·9 kc/s, the upper sideband response was 800 c/s to 3·5 kc/s. This difference in the audio frequency range showed quite clearly that the upper sideband carrier crystal frequency was too far away from the filter passband and a replacement crystal having a frequency 400 c/s nearer was obtained and effectively equalized the bandwidths of the two sidebands.

Although both upper and lower sideband were now substantially the same in response, the restriction of frequencies below 700 c/s was still most marked and pointed to a deficiency elsewhere in the set. An inspection of the circuit diagram showed that the intervalve coupling capacitor (C149) from the microphone amplifier was only 2,200 pF in value and would account for a loss in lower middle and bass. It was an easy matter to parallel this capacitor with a 0.01 μF ceramic and check the response once again by swept audio means. The overall passband now measured down to 400 c/s on lower sideband and 350 c/s on upper and was considered to be satisfactory. The same thing was done on the receiver by paralleling a 0·01 μF capacitor across the audio coupler (C127) which had a value of only 1,800 pF. Although the effective speech quality on receive is limited by the small open cabinet loudspeaker system, the increase in lower frequency response was quite noticeable and eliminated that " everyone sounding the same " effect which was particularly annoying and irritating when listened to for long periods. Incidentally, a large loudspeaker and cabinet really shows what the tranceiver will do and the reproduction after the capacitor modification was remarkably good indeed.

Perhaps it might be considered slightly odd that the reason I purchased a KW2000 was to use it on v.h.f. via a translator, but then my main interest is with v.h.f. and as I like making specialized equipment for these frequencies the KW2000 was the ideal prime mover (see RSGB BULLETIN, June, 1964). In the course of testing a separate a.m. rig on 2m it was observed that if the KW2000 was switched on with the microphone lead in but no microphone connected to it that full modulation could be effected due to rectified r.f. from the 2m rig getting into the microphone amplifier. The cure was to connect a 100 pF capacitor from the grid of the microphone amplifier valve V1a to its cathode direct and not to earth. This effectively stopped the rectification taking place and also the distortion which I had been getting on speech peaks when using 2m s.s.b.

These very simple modifications are straightforward to do and do not incur any butchering of the circuitry or the wiring, and I feel that they are worthwhile incorporating by those operators who are fussy about their speech quality. It should be borne in mind, however, that the modifications do effectively broaden the selectivity slightly.

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Single Sideband (Continued from previous page)

measured. The single-tone amplifier efficiency is therefore: p.e.p. output divided by p.e.p. input, multiplied by 100 x-e pressed as a percentage.
To summarize:

P.e.p. input = h.t. voltage × anode current.
P.e.p. output = 2 × mean power output. Or $I^2 \times 75$ (I being the new r.f. ammeter reading with single-tone input)

$$\text{Efficiency} = \frac{\text{p.e.p. output}}{\text{p.e.p. input}} \times 100\%$$

An alternative method of measuring p.e.p. output is to use a diode probe voltmeter across the dummy load. The voltmeter reading squared and divided by the value of the load equals the p.e.p. output in watts.
I.e.

$$\frac{V\,(\text{voltmeter})^2}{75} = \text{p.e.p. output.}$$

It will be noted that whenever a transmitter is driven with a two-tone input there is a definite relationship between the p.e.p. output power and the mean or average output power. The mean power output is always exactly half of the p.e.p. output; this assumes a true half sine-wave envelope and no flat topping or other distortion of the waveform.

Most of the r.f. ammeters in use by amateurs have been obtained from surplus sources and will have doubtful accuracy. Note, however, that these meters are heat operated devices and are calibrated in r.m.s. values. They can therefore be calibrated with d.c. obtained from the car battery or other suitable source. The meter to be tested is connected in series with a 100 ohm potentiometer and the workshop AVO or similar testmeter and connected to the 12 volt supply (with a 2 volt battery a 10 ohm potentiometer would be suitable).

Further information on the theory of two-tone and single-tone testing may be found in " Single Sideband " in the issues of the BULLETIN from September 1961 to May 1962.

Circuit Correction

In " Single Sideband," RSGB BULLETIN, July 1965, Fig. 1, the rectifier bridge associated with T1 is incorrectly drawn; the two silicon rectifiers in the top right hand arm should be reversed in polarity. Heater rating for the 6HF5 valve is 6·3 volts, 1·25 amps each; the total heater rating is 6·3 volts, 9 amps.

A SIMPLE TRIPLER-CAVITY FOR 23CM

By R. E. T. DABBS, G2RD*

U.H.F. operators interested in transmitting a signal on 23cm may feel that access to a lathe is a prerequisite to building a tripler cavity. This is not the case, for the box type cavity described in this article can be constructed without the aid of sophisticated equipment. In so far as performance is concerned, it will operate up to 50 watts input without difficulty.

From the drawings associated with this article, F8MX constructed a similar tripler with which he made the first F to G contact on 23cm, and this should give an idea of its capabilities. The box cavity is in fact a slightly modified version of a design by G3FP, the changes being associated with minor modifications to constructional details and dimensions.

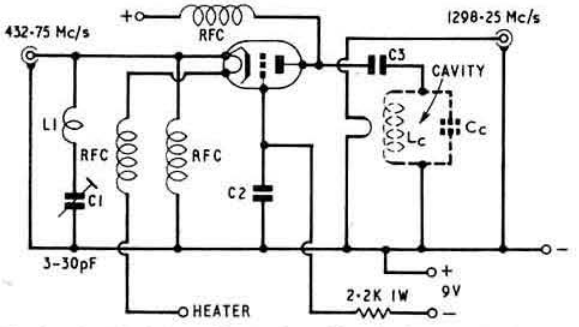

Fig. 1. Circuit of the tripler-cavity. C2 and C3 are formed by the anode and grid plates in the cavity; Cc and Lc represent the cavity; L1 is formed from thin copper strip, $\frac{3}{16}$ in. wide and $2\frac{1}{16}$ in. long bent to a " U " shape; RFC, $2\frac{1}{2}$ in. of 20 s.w.g. enam. copper, wound on $\frac{3}{16}$ in. diam. former.

The cavity is designed for use with either a TD1-100 or 2C39 disc seal triode, and can be driven by any 70cm transmitter capable of giving a few watts of output. From the circuit diagram of Fig. 1 it will be seen that the valve operates in the grounded grid mode, the drive being applied directly to the cathode. The 23cm output is taken from a loop (Fig. 8) which couples into the cavity.

Construction

The cavity is constructed from 20 s.w.g. sheet brass, the general details of which, together with part of the assembly order, are shown in Fig. 2. Full details of the main body of the cavity are shown in Fig. 3. This is constructed by forming up the four sides of a flat sheet to produce an open box. It should be noted that the corners are not soldered. This permits easy movement of the grid tray which is a sliding fit inside this open box. It also allows a good contact to be made between the grid tray and the box when the side fixing screws are tightened.

The position of the grid tray in the box is the coarse adjustment for the anode circuit. Fine tuning is achieved by means of a tuning paddle which is also illustrated in Fig. 3. This consists of a $\frac{5}{8}$ in. by $\frac{3}{4}$ in. metal plate which is soldered into a slot cut into the end of a $\frac{1}{4}$ in. operating spindle. This brass spindle, and the bush through which it passes, were salvaged from a discarded volume control.

Output from the cavity is taken via the $\frac{1}{2}$ in. inside diameter tube mounted directly opposite the fine tuning control. Into this tube slides the aerial coupling probe illustrated in Fig. 8. It is important to ensure that the probe unit is a reasonably tight fit into the tube on the side of the cavity, and to this end, if possible, the two parts should be constructed from telescopic tubing. Since the diameter of the outer tube is not critical to within $\frac{1}{32}$ in. it is permissible to cut a lengthwise slot in it to allow it to be closed up slightly and thus ensure a tight fit round the probe.

The anode and grid plates are shown in Figs. 4 and 5 respectively, and as will be seen they are quite straightforward. Careful attention must be paid to the contact fingers for the valve, and it is important to ensure that the final size is suitable for the particular sample of the valve being employed. The fingering is constructed by making suitably spaced cuts with a very fine saw part way across a length of brass strip. This strip is then formed into a circle,

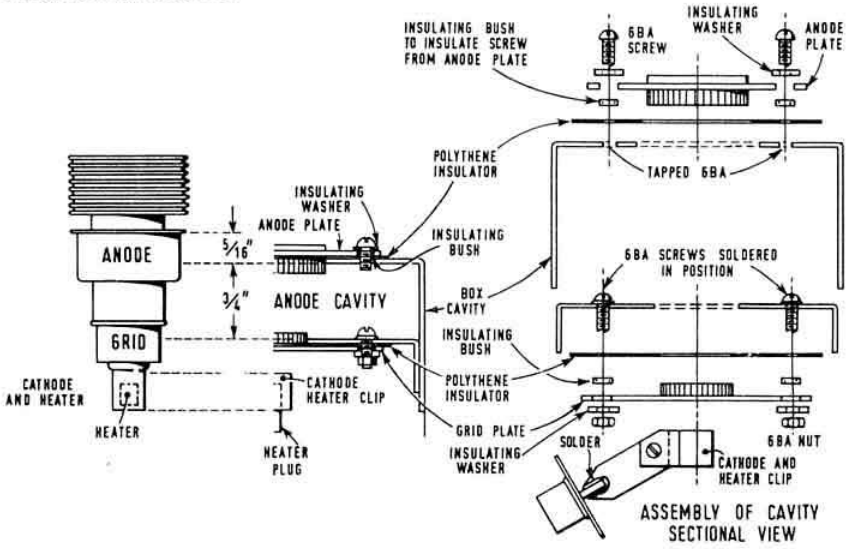

Fig. 2. Assembly of cavity. The position of the valve is very important: it should be placed for maximum output, but this will affect the tuning. Should the tuning paddle not correct the tuning, the grid tray will need to be moved slightly.

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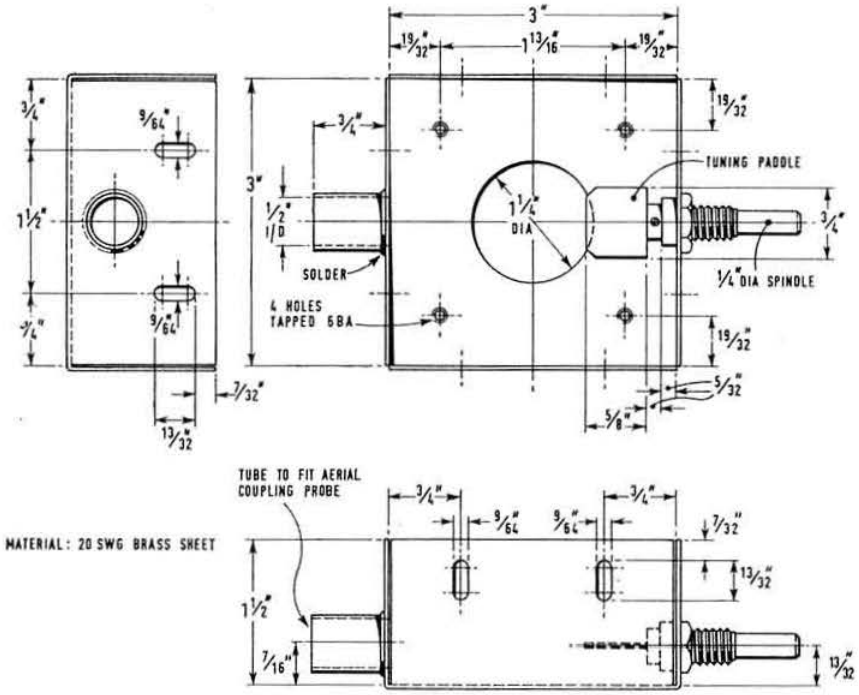


Fig. 3. Box cavity b dy.

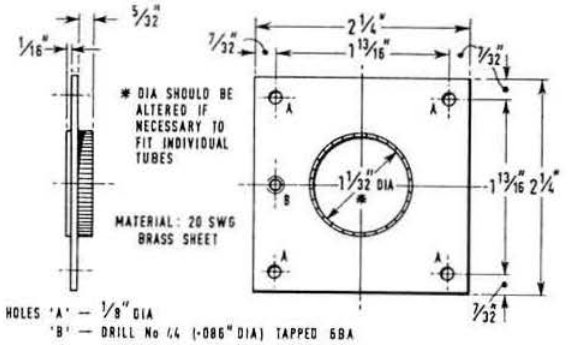


Fig. 4. Anode plate.

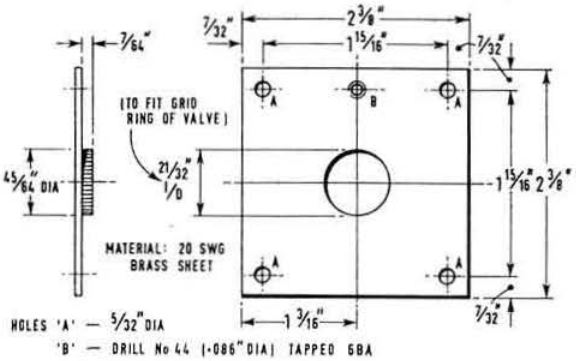


Fig. 5. Grid plate.

fitted to the inside of the hole provided, and soldered into position. Small adjustments to the final size may be achieved by slightly bending the contact fingers.

Polythene sheet with a thickness of 0·008 in., suitably cut to shape, is used as insulation between the anode plate and the cavity body. This has been found satisfactory for anode voltages up to 600 volts. Between the grid plate and the grid tray, a similar sheet of polythene is used.

The co-axial input socket is mounted on the bracket shown in Fig. 7, and this is held on to one side wall of the cavity by means of two of the screws which hold the grid tray in position. The lead from the co-axial socket to the cathode of the valve is made from thin copper strip $\frac{3}{8}$ in. wide. If copper is not available, brass may be used, so long as it is thin. It is important that the lead be not too rigid as otherwise there may be a danger of damaging the valve.

The input inductance (see L1 in Fig. 1) consists of a length of brass or copper strip, $2\frac{11}{16}$ in. long by $\frac{3}{16}$ in. wide formed into a U with arms of equal length. With the base of the cavity uppermost, this U-shaped inductance is inverted and soldered at one end to the co-axial socket, at the other end to the 3-30 pF Philips trimmer. The earthy side of this trimmer is soldered to a tag located under one of the two 6 BA screws in the corner of the grid tray farthest away from the co-axial input socket.

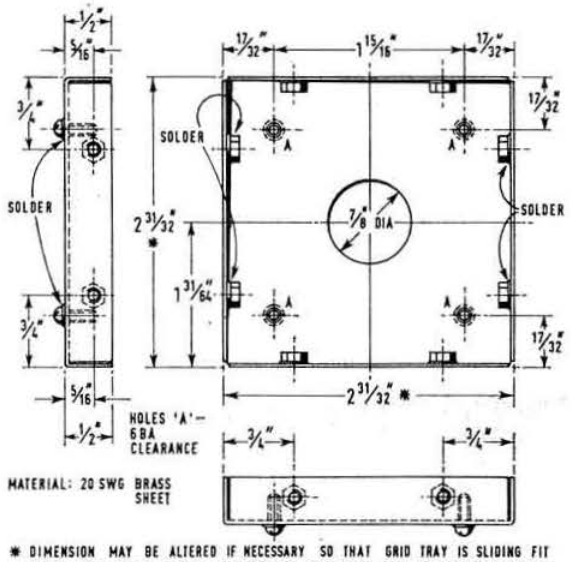


Fig. 6. Grid tray.

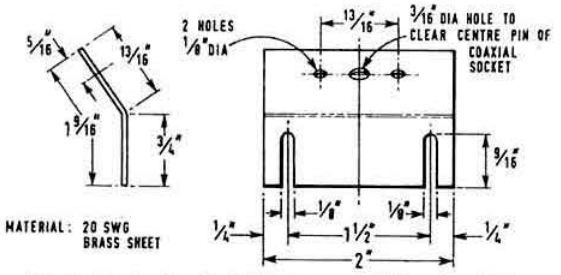


Fig. 7. Bracket for the Belling-Lee co-axial input socket.

The 2·2 K ohm grid resistor is soldered to a tag secured by a short 6BA screw to the centre of one side of the grid plate. It is particularly important that this screw, and its counterpart on the anode plate, are filed off flush with the underside of the plate, otherwise the polythene insulation will be damaged, and shorts occur.

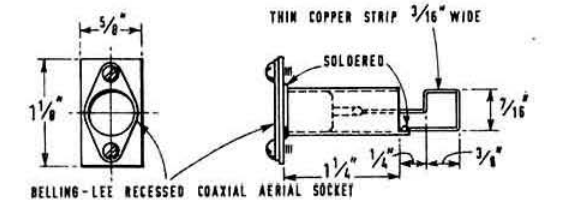


Fig. 8. Aerial coupling probe.

Adjustments and Operating Conditions

Connect the 9V bias supply to the valve with a 0-50 mA meter in series with the negative lead. Apply a 6V source, capable of supplying 1A, to the heater of the valve. Do not attempt to apply h.t. at this stage, but connect the anode of the valve from the solder tag on the anode plate via a 100 mA meter to the cavity body.

If 70cm drive is applied to the cathode, grid current will flow, and some anode current will show on the 100 mA meter. The trimmer C1 and the inductance L1 should be

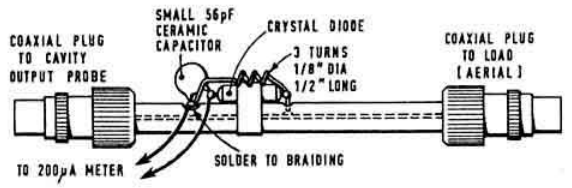


Fig. 9. Diode probe on a co-axial line.

adjusted to give maximum grid current. This should be in the region of 25 mA. The earthing point of the trimmer may need changing to a different point on the grid tray if insufficient grid current is noted. Unfortunately there is a multitude of combinations of the capacity of C1 and the inductance of L1 which will give resonance at 70cm, but the correct ratio of these two is quite critical in order to achieve maximum drive to the tripler. Once the grid current is of the correct order, then the meter in the anode circuit should read between 30 and 60 mA.

When a suitable level of grid current has been achieved, attention can be turned to resonating the anode cavity. For this it is necessary to have some means of indicating 23cm output. One possibility is to use a 6V 0·04A flash lamp bulb soldered directly to a co-axial plug. Alternatively, and in many respects better, a diode probe on a co-axial line, as illustrated in Fig. 9 can be used.

First, set the tuning paddle to an angle of 45° to the plane of the anode plate. Slightly loosen the four grid tray fixing screws and then very carefully move the position of the grid tray until resonance is found. Resonance will be denoted by a small dip in anode current. If the diode probe on the co-axial line is in circuit a reading will be obtained on the diode meter. Lock the grid tray into position, and check that the tuning paddle will resonate the cavity more critically. The anode may now be disconnected from the chassis and taken to a supply of about 350V positive via an r.f. choke. The anode current may lie anywhere between 50-100 mA depending on the valve.

Acceptable levels of modulation may be achieved by modulating only the 70cm drive to the 23cm tripler. For c.w. operation, the 70cm stage can be keyed, and under key-up conditions, the anode current in the tripler should fall to zero.

A Transistorized Frequency Marker (Cont. from page 643)

the circuit will not function. If an oscilloscope is not available, connect a pair of high impedance headphones across R4 temporarily. If the circuit does not oscillate, reverse the connection to the primary of T2.

The crystal controlled oscillator TR1 will not function unless the transformer T1 is tuned correctly. The signal should be heard on a receiver tuned to a megacycle or half-megacycle point in the range 1 Mc/s to 5 Mc/s. Slowly adjust the core of T1 until the crystal oscillator starts. Note the position of the core. Continue to adjust the core until oscillation ceases. Again note the position of the core. Now set the core at the mid-position of the two noted settings.

For highest accuracy, tune the receiver to the standard frequency transmission from MSF on 2.5 Mc/s and adjust the core of T1 for zero beat. If the frequency appears to be a little high, it may be necessary to place a 3-30pF trimmer across the crystal and set this to the capacity which, with the core in its mid position, produces zero beat with the frequency standard transmission.

To check the interpolation oscillator, tune the receiver to a megacycle or half-megacycle point other than 2.5 Mc/s. Set the selector switch S1 to position 3—both r.f. oscillators functioning. A beat note will be heard. Adjust the core of T3 until zero beat is obtained.

Once a zero beat has been obtained, *slowly* tune through half a megacycle and count the number of carriers heard. There should be *nine* only; the tenth will be located, along with the crystal, on the next half-megacycle point. If there are more or less, then the interpolation oscillator is not operating on 50 kc/s, and further adjustments will be required to this section, either by modifying the values of C10 and R16 and/or by adjusting the core of L1. If the frequency chosen for the interpolation oscillator is 100 kc/s, only *four* carriers should be heard *between* any two half-megacycle points.

Conclusion

Consuming a maximum of 3.5mA at 9V the power requirements of this unit are really diminutive, and this, coupled with its small size, makes it particularly attractive.

Coupling between the marker unit and the receiver should be as light as practicable. On the lower frequencies, and assuming that it is constructed on a metal box, a short length of wire connected to the output socket may be adequate. As the frequency increases, however, tighter coupling will be needed, for as the order of the harmonics increases, so their power decreases.

Two Elements for Ten

By N. W. AUSTIN, G2FQR*

THE writer is one who, in common with many other amateurs, does not have access to acres of land for aerial farms, wishes to have reasonable regard for neighbours' gardens and outlook and yet at the same time feels a need for something better in the way of an aerial than the simple dipole. Tne beam to be described was designed to fulfil these objects and, whilst it is not claimed to be the ultimate, nevertheless gives a worthwhile gain and directivity without sacrificing efficiency by the use of shortened elements, traps or other and possibly difficult to adjust devices.

The requirements to be met at G2FQR were (a) worthwhile gain, (b) variable directivity at will through 360°, (c) impedance matching without tricky adjustments, (d) ease of construction and erection, and (e) minimum size and weight consistent with efficiency and mechanical strength.

Design

The arrangement finally evolved meets these requirements as follows:

(a) Theoretical gain 5·5db.
(b) Rotation restricted to 360° in one direction (and back) thereby avoiding the use of slip rings, inductances, etc., necessary for continuous rotation.
(c) Feeder: any length of 300 ohm ribbon to a quarter-wave section of 70 ohm screened line matching into a radiator centre impedance of approximately 14 ohms. (see Appendix).
(d) " Plumbers' delight " construction using 1 in. diameter dural for elements and boom.
(e) Element lengths half-wave with 0·1 wavelength spacing.

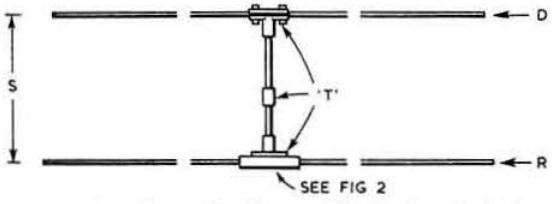


Fig. 1. Plan view of beam. D—Director, 15 ft. 5 in. long. R—Radiator 16 ft. 2 in. long. S—Spacing 3 ft. 5 in. T—" T " Junctions.

Construction

Beam. Reference to Fig. 1 shows the beam to consist of a close-spaced two element (radiator/director) array for 28·5 Mc/s. This type of array is said by some authorities to be more difficult to adjust than the more usual radiator/reflector (0·15 wavelength spaced) arrangement but in the writer's experience the practical results in actual on-the-air operation are virtually the same with the possible exception that the wider spacing using a reflector gives better rejection from stations off the back of the beam. The writer was prepared, however, to accept this in order to obtain a smaller sized array.

Intending constructors may find some difficulty in obtaining 17 to 18 ft. lengths of 1 in. duralumin tubing but this is of no consequence as what is required is four tubes each 9 or 10 ft. long. Two of these, after being cut to the required length, can be joined by a 12 in. piece of the same material cut lengthwise on one side only, compressed and forced into the ends of the tubes which are to form the director element. This will form a double thickness of metal at the centre of the element which can then be bolted to the die-cast " T " junction before the latter is fixed to the 3 ft. 5 in. length used for the boom. A similar procedure is used for the radiator, but here provision must be made for keeping the tubes electrically separated both from each other and from the boom to permit connection of the 70 ohm matching section (see Fig. 2). Only one half of the " T " junction (see B in

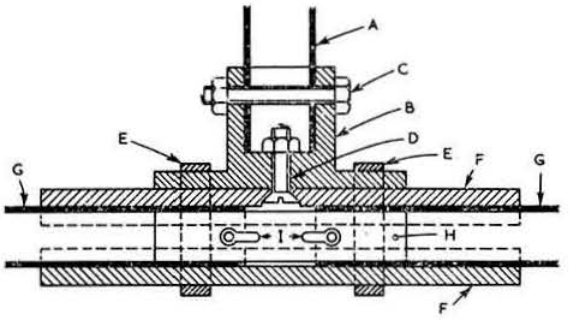


Fig. 2. Centre of Radiator. A—Boom. B—Lower half of " T " junction. C—Bolt through boom. D—C/s bolt and nut securing F to junction. E—Jubilee clips surrounding whole assembly. F—Paxolin tubing (split lengthways). G—Radiator. H—Wood or tufnol dowel (force fit inside ends of elements). I—Points of attachment of 70 ohm line.

Fig. 2) is used at this point although a full junction, i.e. with the top clamping bar, is employed at the point of balance of the array for the purpose of securing the boom to the mast (see Fig. 3). The arrangement shown for attaching the 70 ohm matching section to the radiator was devised by the writer as a centre " T " *insulator* which would accept 1 in. tubing at all three outlets was not available. Needless to say, the electrical connections must be soundly made and thoroughly protected against the weather before erection.

Mast. The mast is constructed in two sections, the upper one being a 10 ft. length of 1 in. o.d. hardened dural of the type commonly used for television aerials and the lower

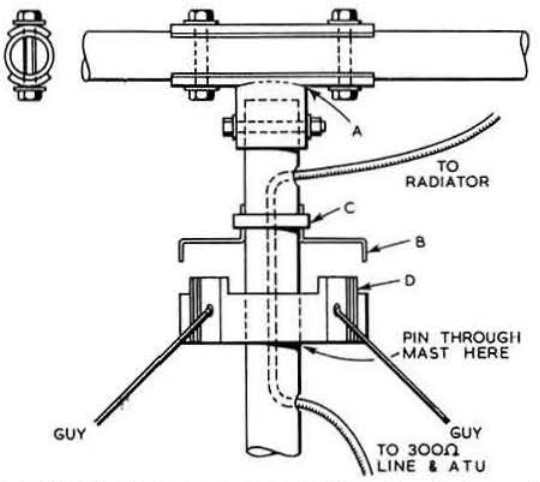


Fig. 3. Mast-head arrangement. A—" T " junction. B—Protective lid. C—Jubilee clip. D—Collar (see Fig. 4).

* 20 Worcester Close, Reading, Berkshire.

section 8 ft. of 1¾ in. o.d. water pipe having an inside diameter slightly larger than 1 in. Metal guides were fabricated to support this lower section, these being fixed to the sides of the shack with the base of the section resting in a suitable bearing. The upper section is guyed at the top by means of a collar surrounding a 1 in. bearing. This collar is fabricated, as shown in Fig. 4, from strips of 16 s.w.g. aluminium and it is suggested that the three sections necessary be shaped up on the bench to fit round the bearing before the latter is fixed to the mast. The ½ in. " lips " should be formed on the upper side of the collar to take the downward thrust imposed when the guy wires are tightened up. The bearing should be a force fit on the mast and located about 1 ft. from the top with a steel pin through the mast on the lower side. A protective lid can then be fitted over the bearing and the 70 ohm matching section inserted before bolting the boom " T " junction to the top (see Fig. 3).

The design of the mast enables the lower section to be completed separately and checked for ease of rotation and mechanical strength. Tne array, already fitted to the top section with feeder and guys (pre-cut to the required lengths) attached can then be carried up like an umbrella and dropped 18 in. into the top of the lower section. A stainless steel pin is then inserted through both tubes, the guys made off, and the far end of the 300 ohm feeder attached to the aerial tuning unit.

The whole mast, with the beam fixed to it, can then be rotated at will. The writer uses the Armstrong method at the moment!

General

The knowledgeable reader will have noted that no reference has been made to tuning the elements. The reason is simple—they weren't! Theoretically, they should be but the writer has never felt that the time and effort he has spent in the past on tuning a variety of beams has really paid realizable dividends in the sense that it made the difference between working and not working DX on 10m. One of the great attractions of " 10 " is that when it is wide open the world is yours and what you need is not the fractional db increase to be gained by tuning the elements but variable directivity and low angle radiation. This beam will give you these simply, easily and at low cost and the experience you gain from its construction and use may tempt you to try bigger, higher and better beams!

APPENDIX

Quarter-wave Matching Section

(a) *Impedance* (Z)

$$Z = \sqrt{Z_i Z_o}$$

where Z_i = aerial impedance

Z_o = line impedance.

$$Z = \sqrt{14 \times 300} = \sqrt{4200}$$

$$= 65 \text{ ohms} \ldots\ldots\ldots (i).$$

(b) *Length*

$$\frac{\lambda}{4} = \frac{246V}{f(Mc/s)} \text{ ft.}$$

(V = Velocity factor)

Using 70 ohm twin feeder

$$\frac{\lambda}{4} = \frac{246 \times 0{\cdot}66}{28{\cdot}5} = 6 \text{ ft} \ldots\ldots\ldots (ii)$$

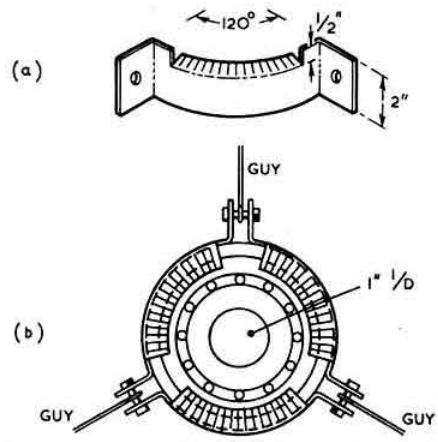


Fig. 4. Support for guys and top bearing. A—One of the three sections required for collar. B—Plan view of collar enclosing bearing.

Receipts

Receipts for subscriptions paid by cheque, bankers' order or postal order are not now issued unless specially requested.

SAID LONG AGO

" A strange phenomenon, first observed by the writer in late 1935, was the appearance, at irregular times, of a radiation which took the form of a smooth hissing sound, when listened to on a receiver. It was pointed out by G2YL that on the days when hiss was heard that there had frequently been fade-outs or poor conditions on the high frequencies. G2GD had also noted that when the hiss has been received magnetic storms are also reported. On one day the hiss may only last for a few seconds and not be heard again that day. On other occasions it will last as long as five minutes, then disappear and reappear again within a few minutes, repeating the process several times. It invariably starts at a weak strength and gradually builds-up to a maximum, then gradually fades away again. The phenomenon apparently originates on the sun, since it has only been heard during daylight, and it has been suggested that it is caused by a stream of particles shot-off from the sun during abnormal activity."

" Observations on the Ultra-high Frequencies 1936."—Denis Heightman, G6DH.
T. & R. Bulletin, May 1937

" We purposely refrained from commenting in our last two issues about the ' his ' phenomenon because we felt sure certian members qualified to speak would rise to the bait thrown out by Professor Sir Edward Appleton when he referred in a recent B.B.C. news flash to the ' his ' as being a ' new ' discovery.

" It is gratifying to notice that *Practical Wireless* in its April issue pays tribute to the pioneer work of those British Isles amateurs who first recorded and described the ' hiss '."

RSGB Bulletin, April **1946**

Remote Tuning for the B44 Receiver Section

Using a Variable Capacity Diode

By D. R. TOPPING, AMIERE, G3HYG*

IN common with many other mobile operators the writer uses a B44 transceiver in his car. In order to satisfy aesthetic considerations the equipment was relegated to the boot and a remote control system installed. Much thought was given to the method of tuning the receiver and after some experiment a circuit was evolved based on the common practice of substituting a tuned oscillator for the normal 6 Mc/s crystal. No originality is claimed for this approach, which is used by many stations with a fair degree of success, the main restriction being the bandwidth of the first i.f. amplifier which tends to reduce sensitivity at band edges and also that adequate oscillator injection is not always easy to obtain. Nevertheless it formed a satisfactory basis on which to develop a variable capacity diode tuning arrangement and it is this latter aspect of the circuit which is hoped will be of interest to others.

Before describing the circuit itself, some notes on these interesting devices may be of value, particularly as a fuller understanding of their characteristics will allow an adaptation to other equipment or the use of other types of diode which may be more readily available.

Variable Capacity Diodes

It is a natural property of all semiconductor junctions to exhibit a capacitance across their terminals, the value being some function of the potential difference between those terminals. In many cases this effect is unwanted, a typical example being the way that the input capacitance of, say, a transistor i.f. amplifier changes with the value of applied a.g.c. Steps are usually taken both in the design of the semiconductor device and its associated circuitry to reduce the effect of this capacity change to a minimum.

The variable capacity, Varicap or Varactor, diode is a device in which this effect is encouraged and exploited rather than suppressed and many circuit applications have been found where these components have proved very valuable, mainly in the sphere of automatic frequency control, frequency modulation or harmonic generation—their value lying in the fact that large capacity swings may be obtained at high frequencies with a very good power factor. In terms of frequency control a Varicap diode can operate at frequencies well above the practical limitations of a thermionic reactance valve circuit and is much more convenient, particularly at v.h.f. than a magnetic or ferrite reactance modulator.

For the Varicap to be used as a capacitor of good power factor, it must clearly be operated in a non-conducting condition and it may be shown that the effective capacitance, C, with a reverse bias applied, follows the general function:

$$C = \frac{A}{\sqrt{K + V}}$$

where A = a function of area and the material.
where K = a function of the material with the dimensions of a voltage.
and where V = the reverse bias.

Considering this expression it will be seen that as the applied potential increases the capacitance will fall and, also, that the rate of capacity change increases rapidly as the bias voltage tends towards zero. The C/V curve of a typical diffused silicon diode together with other characteristics are reproduced in Fig. 1 and Table 1.

When using a Varicap diode it must never be forgotten that even if it is intended to represent a variable capacitor it nevertheless remains an active component, i.e. it never ceases to be a diode. Therefore as the true potential across the diode can be said to be the algebraic sum of both the control bias and the instantaneous value of the applied signal, then, under normal conditions, the control bias should always exceed the peak value of the voltage in the circuit being controlled otherwise the diode will conduct, rectify and cancel the bias which is being applied to it. Moreover, reverse breakdown (Zener effect) will occur when the sum of bias and signal exceeds the critical potential.

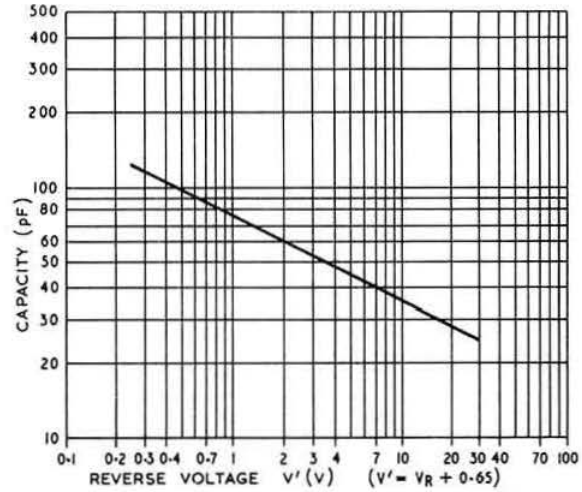


Fig. 1. Capacitance plotted against reverse voltage for a typical diode.

Another consideration is that if the applied signal voltage is large, then the instantaneous capacitance presented by the diode to it will vary significantly during the period of the signal voltage. Referring back to Fig. 1, two conditions may be considered; if the applied reverse bias is 3·5V then the capacity of the diode is given as 50pF. Suppose this diode to be in parallel with a tuned circuit with a r.f. signal of a few microvolts applied, then the capacitance will remain so near to 50pF as to be practically constant; if, however, the applied r.f. voltage to the circuit had a peak-to-peak value of,

TABLE 1

Characteristics of a typical diffused silicon diode.

Reverse Capacity c_R V_R = 2V f = 30 Mc/s	55 ± 10	pF
Series Resistance r_S V_R = 2V f = 30 Mc/s	1	ohms
Forward Volt drop V_F at I_F = 60mA	< 0·8	V
Reverse Breakdown Voltage BV_R	> 30	V
Leakage Current I_R V_R = 10V	< 100	nA
Loss factor @ 100 Mc/s tan δ	3×10^{-2}	—

* 3 Bentley Crescent, Fareham, Hants.

say, 3V then the instantaneous reverse bias to the diode will vary between 2V and 5V. Reference to Fig. 1 will show that under these conditions the capacitance value will vary between 60pF and 45pF during the period of the cycle. The effect of this will be twofold; one that the effective capacitance will have a different value and, secondly some distortion of the wave shape will take place. It is as a result of this latter effect that variable capacity diodes are used for frequency multiplication, but that is another story . . . !

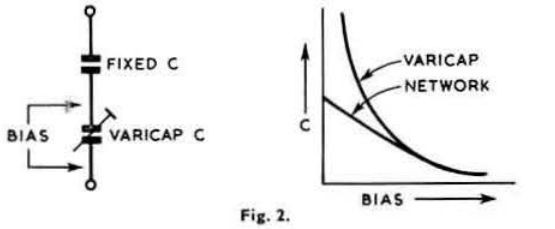


Fig. 2.

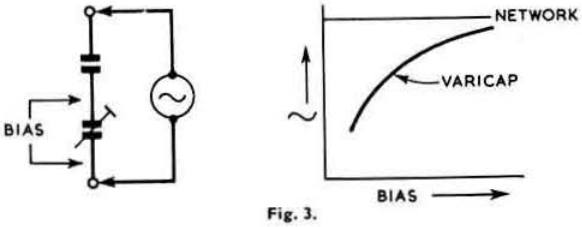


Fig. 3.

The demands made on the circuitry are now becoming apparent. It is known that

(i) the majority of capacity change takes place at a low applied bias—this is undesirable because it would cramp the tuning at one end of the control;
(ii) the bias applied to the diode must always exceed the r.f. voltage across it;
(iii) the effective frequency of a tuned circuit containing a Varicap diode becomes a function of the amplitude of the voltage with which it is working.

Considering the first two problems, it is fortunate that a common solution may be found, for if the variable element is placed in series with a fixed capacitor, then a logarithmic variation to the Varicap capacity results in a near linear variation for the series capacity of the network—see Fig. 2. Simultaneously, as the capacity of the Varicap increases (lower applied bias) so it will receive a smaller proportion of the applied voltage to the network— see Fig. 3. By placing the varicap in series with a fixed component in this way a considerable improvement to tuning feel is obtained and the need for high values of standing bias removed.

Modifying the B44

As most of the considerable amount of mobile operating in the Sussex and Hampshire area is conducted on a single net frequency it was decided at an early stage that to maintain the crystal tune facility for use when required would be a valuable asset and to facilitate this a miniature relay is used to switch the receiver oscillator grid either to the existing crystal or to a tuned circuit of approximately 6 Mc/s. A spare set of contacts on the relay is used to short circuit the tuning components not in use. This is particularly desirable in the " tuned " case as even when disconnected the high Q crystal can throw a considerable load on the oscillator circuit through stray capacity coupling.

The B44 receiver is used on 4 metres as a double superheterodyne, operating with oscillator low injection at first mixer (crystal times 9) and oscillator high injection at the second mixer (crystal times 3). It may be shown that the tuning range of the receiver becomes the oscillator change multiplied by 12. In fact if the oscillator frequency is f_o, the second i.f. frequency is f_2, and the signal frequency is f_s, then

$$f_o = \frac{f_2 + f_s}{12}$$

Therefore with the 4 metre amateur band extending from 70·1 Mc/s to 70·7 Mc/s—a total width of 600 kc/s—the oscillator is required to change by 50 kc/s. With a second i.f. of 2·6 Mc/s, the actual oscillator limits become 6·06 Mc/s and 6·11 Mc/s approximately.

In choosing the LC ratio of the oscillator circuit consideration was given to several aspects of performance, many

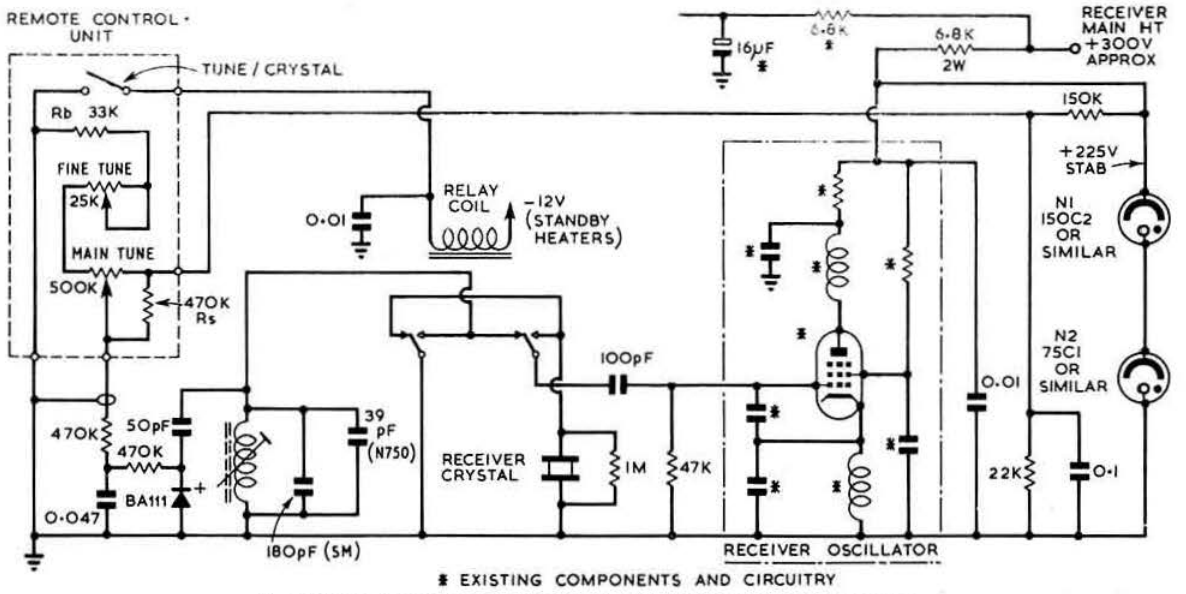


Fig. 4. The necessary modifications to the B44 for providing remote tuning.

of which had conflicting requirements, i.e. oscillator injection would be high if the *LC* ratio is high but on the other-hand drift, microphony, and mechanical stability would be impaired. Similarly, in first order terms, as the capacity range of the variable diode is also limited one would expect to have a larger tuning range if the fixed value of the capacitor was low, but fortunately a satisfactory compromise between all these requirements may be achieved. One interesting feature is that if the *LC* ratio is increased beyond a certain point then the tuning range begins to fall; this follows from the fact that the r.f. voltage to the oscillator circuit also increases thus preventing the diode from being biased over its full range. With the values shown a tuning range of approximately 800 kc/s is realized, oscillator injection is adequate, microphony non-existent and it is possible to use the chassis either in or out of the metal case without re-setting the oscillator core.

The revised circuit is shown in Fig. 4.

The diode chosen to effect the capacity swing was a STC BA111 (Fig. 1 and Table 1 refer to this type). It will be noted that the reverse breakdown voltage, BV_r, is given as being "exceeding 30V." The maximum potential of the bias control line is accordingly limited to this figure, but in any event there would be no value in trying to exceed this figure as no worthwhile capacity swing would be obtained.

The two neon stabilizers, N1 and N2, are very necessary for mobile operation. A car battery may vary from as low as 10V up to nearly 14V depending on engine speed and the loading imposed by other equipment, such as headlights. The resultant variation in h.t. voltage within a B44 is considerable and stabilization is needed for two purposes, firstly, and most obviously, to clamp the bias control source and, secondly to fix the h.t. supply of the oscillator valve. By this latter means the oscillator amplitude is retained constant which it will be recalled is an essential requirement for frequency stability in circuits of this kind.

The time constant of the control circuit should not be so long as to give a sluggish feel to the tuning, yet should not be so short as to allow random pick-up on the remote control lead to be of sufficient magnitude to cause frequency modulation of the oscillator. In the writer's case the cable from the transceiver to the control position is some 15 ft. long and as an added precaution against this effect, the bias control lead is screened.

Tuning by this method lends itself ideally to electrical bandspread so two potentiometers are fitted in the control box, one for fine tuning after having located a station on the coarse control. A minimum value of bias voltage is determined by R_G, which value is just great enough to prevent the diode rectifying the oscillator voltage and cancelling its own bias. Some attempt has been made to correct for residual non-linearity by the shunt resistor R_S, though clearly the use of a different law potentiometer or even the same control connected the other way round would modify the value or need for this component.

In all, three B44 receivers have now been modified to this circuit by different amateurs with their own interpretations of an optimum mechanical layout. Performances have been so similar as to indicate that no unduly critical values occur. It is obviously necessary to mount the relay as close to the receiver oscillator grid as possible and fortunately a clear area exists for this purpose if the support to the vibrator compartment screen is re-positioned. The neon stabilizers are fitted in the space vacated by the aerial filter box, which had previously been removed. It was considered convenient to have the relay energized in the variable tuning condition, thus if the remote control unit is unplugged for servicing then the receiver returns to its crystal control position. Moreover by this means the switch could be accommodated on the main tuning control by using a component more usually destined for on/off-volume control purposes.

After modification, tuning up the receiver is extremely simple: all that is necessary is roughly to set the tuned circuit to 6 Mc/s with a g.d.o., adjust the oscillator core until the rise in noise indicates a sensitivity peak and then match the signal received by a known crystal to the appropriate point on the tuning potentiometer dial. It may be considered advantageous to re-tune the first i.f. of the receiver in the centre band position, thus distributing the sensitivity more evenly over the tuning range; but in the writer's case it was decided to leave the receiver optimised on 70·26 Mc/s as the majority of activity still seems to be at the l.f. end of the band. Notwithstanding this, however, a satisfactory performance is still obtainable at the h.f. end of the band and has yielded many worthwhile QSOs at 70·65 Mc/s.

BOOK REVIEW

THE DESIGN OF LOW-NOISE TRANSISTOR INPUT CIRCUITS. By William A. Rheinfelder. 160 pages including 107 diagrams. Published in Great Britain by Iliffe Books Ltd., Dorset House, Stamford Street, London, S.E.1. Price 30s. (Originally published in the USA by Hayden Book Co. Inc., New York.)

This book covers the design of low-noise input circuitry for r.f. and a.f., with particular emphasis on r.f. Although the book is mainly concerned with transistors, reference is frequently made to the application of similar principles to valves. Treatment is aimed at students (which includes radio amateurs), and circuit designers of all levels. A chapter is devoted to descriptions of modern commercial circuitry in the USA and in Germany.

The chapters on the concept and measurement of the noise figure of a receiver are particularly interesting, and have an essentially practical approach to improvements which may be made. An example is the "Tap Circuit" due to R. Cantz of Telefunken, which enables the input circuit of an r.f. stage to be simultaneously noise and power matched, which has the advantage of maintaining a low s.w.r. in the feeder.

The problems of cross-modulation brought about by crowded bands and nearby powerful stations are considered, and the reasons why many communication receivers fail in this important respect are explained and suggestions made for improvement. It is shown how the judicious use of a mismatch between the r.f. and mixer stages will improve both the cross-modulation performance and stability, and how this may be accomplished by use of the "Tap Circuit." The effect of emitter current on the cross-modulation characteristics of transistors is dealt with, together with the possibility of improving the noise figure of a mixer stage by the use of a bridge circuit and neutralization.

While use is made of mathematics, aided by numerous graphs, in putting forward the principles involved, this does not replace lucid explanations and the book may be highly recommended to all who are interested in improving their receiving equipment, whether their main interest lies in the h.f. or v.h.f. bands. W. H. A.

RSGB Recorded Lecture Library

Mr. G. S Milne, G3UMI, 10 Raleigh Hall, Eccleshall, Staffordshire, has taken over responsibility for the RSGB Recorded Lecture Library from Mr N. B. Ta Bois. G3HWG, who has been Honorary Curator for several years.

The Ollerton Weekend

THE amateurs, youth leaders and young people who attended the symposium on Amateur Radio at the Ollerton Residential Centre in the heart of the Robin Hood country of Sherwood Forest, Nottinghamshire over the weekend September 11 and 12, can be justly proud of the success and pleasure produced by this venture.

All who are concerned in the forwarding of Amateur Radio in general and the recently formed Education Committee of the RSGB in particular can take real heart from this symposium organised by the comparatively small Newark and District Amateur Radio Society.

It was the first venture of its kind in the country and RSGB President E. W. Yeomanson, G3IIR, who gave the opening talk and later mentioned the work of the RSGB, was rightly enthusiastic. " This may well be the forerunner of many similar events, not only in this part of England but in the whole of the country" he conjectured, and added, " We in the RSGB consider the education of the young is a very important factor and are prepared to support functions such as this to the best of our ability."

The Society did indeed put its weight behind the venture to good effect. When the Newark Society first mooted the idea of a week-end school to introduce radio to youth leaders and teachers, the RSGB saw in it a worthwhile opportunity to get more people interested in the hobby.

With the offer of expert speakers from the RSGB it became obvious that the ideal thing to do was to run a symposium with two parallel courses of lectures—one for those with little or no experience of Amateur Radio and one for established " Hams " anxious to increase their technical knowledge and knowledge of the movement.

Thus was the function planned and it was a happy decision for if ever there was a hobby where the infectious enthusiasm of the established exponent rubs off onto a newcomer, surely it is this. Ollerton proved no exception. By the end of the lecture sessions of Sunday there were excited groups all over the Centre discussing a wide range of topics and starting friendships that were obviously going to last.

RSGB President, Mr Yeomanson, with his intimate knowledge of the Society's work was well equipped to put across the little known facts about RSGB in the well-equipped cosy lecture theatre. There could have been no better choice than Messrs L. E. Newnham, G6NZ, and G. M. C. Stone, G3FZL, Chairman of the Education Committee to whip up interest in the international aspects of Amateur Radio and it would be hard to find anyone more knowledgeable than L. E. Newnham on the history of the movement.

With his experience as a lecturer and speaker, K. L. Smith, G3JIX, held the interest of the experienced " hams " throughout his lecture on the rôle of measurement and then, throwing away his manuscript for the talk in the Centre lounge on how to introduce Amateur Radio to young people, kept his youthful audience enthralled with tales of his own experiences in youth work, adding plenty of sound advice.

R. G. Lascelles, G3AKX, of Jodrell Bank, provided a fascinating lecure on radio astronomy with some superb slides of photographs taken of the planetary system through a high powered telescope. He opened up a vast new world for the amateur, and Flight Lt. J. Hern, G3NAC, of RAF Station, Cosford, took his audience into another fascinating sphere, that of DXpedition " ham " radio, describing the work of amateurs in remote parts of the world. He told the gathering that Rockall, one of the remote places of Britain still not used for DX work, is to be the venue for the next DXpedition.

Two members of the Newark Society, R. Wallwerk, G3JNK, and S. Denner, G3PYY, both teachers, put over the practical case for starting school societies, and F. R. Peterson, G3ELZ, of Grimsby, who will be remembered for his work in the East Coast floods, stirred up uncommon interest in the Radio Amateur Emergency Network to such effect that several hams were drawn to offer support.

Perhaps one of the most enjoyable and moving talks was that given by Eric Box, G3TJO, a blind amateur from Lincoln who described with great sincerity what the hobby meant to a person suddenly afflicted with blindness or some other disability. He communicated to a very appreciative audience the value of Amateur Radio to the disabled in bringing a whole new world of friendship and interest where loneliness and desolation would otherwise exist.

Members of the Newark Magnus Grammar School Radio Society, under Ron Wallwork manned a special station (GB3RH " Robin Hood ") with three transmitters and worked many stations including a number in Europe and Russia, and the keen enthusiasm of the lads of the Mount Radio Club, together with Stan Denner's showing of the 8mm film about their activities, was a treat.

Junior members of the Newark Society amazed their seniors with a well co-ordinated aerial mast erection demonstration in which a five years old girl pulled up into position a 35 ft. mast single handed and Mr. P. Anderson of Newark created great interest with a demonstration of radio controlled model aircraft.

Of course, the week-end would not have been complete without its junk sale and a considerable amount of equipment changed hands to the part-benefit of the Newark Society's expenses.

The organising committee, including Alan Hall, the president of the Newark Society, Roy Clayton, the secretary and Stan. Denner, the registrar of the event, deserve every congratulation for a smooth-running event in which so many lent a hand.

Financially and educationally the venture was a great success and it showed that no small society need have any fears in launching something of a similar nature.

Northern Polytechnic Courses

A course of twenty-six lectures is being given on " The Principles of Modern Network Theory," twenty-five lectures on " Colour Television Engineering," twenty-three lectures on " Transistor Engineering " and fifteen meetings relating to " Audio Engineering Measurements " by the Northern Polytechnic commencing on October 1, 4, 6 and 21 respectively. Full details are available from the Northern Polytechnic, Holloway Road, London, N.7.

Focus on the Call Book

Mr. Frank Spencer, G4AH, has drawn attention to the fact that the first G4 calls were issued during the latter part of 1938 and not early in 1939 as stated in the article "Focus on the Call Book " (May issue). G4AH, who was licensed in November 1938 to operate on 14 Mc/s *only* with an input power up to 10 watts, surmises that some of the newer licensees would not take kindly to those terms!

RSGB Intruder Watch

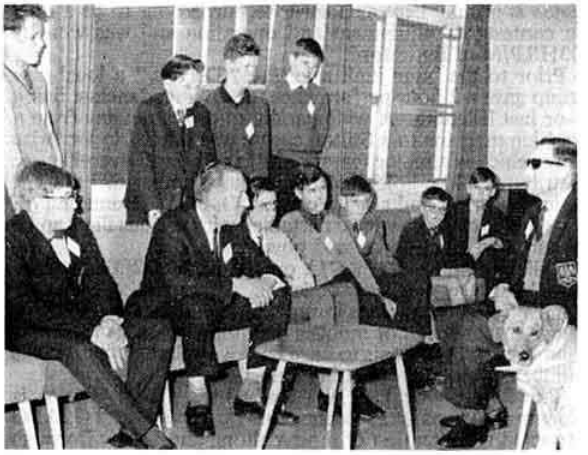
Correspondence for the Intruder Watch should be addressed to the Honorary Organizer, RSGB Intruder Watch, Radio Society of Great Britain, 28 Little Russell Street, London, W.C.1.

A group of those taking part in the symposium on Amateur Radio at Ollerton Residential Centre. The aim, of course, was to help youth leaders and teachers to introduce the hobby to youth clubs and schools.

Members of the Newark Magnus Grammar School Radio Society operating a special transmitting station, GB3RH.

Richard Hall, John Fryer and Peter Seymore, junior members of the Newark School Radio Society, demonstrate the erection of an aerial mast.

Mr A. Graham of Newark Radio Society conducted a grand Junk Sale at the symposium of Amateur Radio at Ollerton in Nottinghamshire.



Mr Eric Box of Lincoln, a blind Amateur Radio enthusiast (extreme right), who effectively communicated his enthusiasm to the members attending. Also in the picture with several young radio enthusiasts is Mr E. W. Yeomanson, President of the Radio Society of Great Britain.

One of the lecturers giving a talk and demonstration to some of the senior members of the party.

Mobile Column

By E. ARNOLD MATTHEWS, G3FZW*

IT was interesting to see a letter published in a recent issue of the ARMS *Mobile News*, in which the correspondent argues a case for the Minister of Transport's now deferred proposal to prohibit the use of radio telephones while on the move. Apart from the risks which driver/operators run because their total attention is not wholly devoted to driving the correspondent asserts that, " You can't tell the fellow you are in QSO with to ' shut up ' if you get into traffic conditions which demand your whole attention!"

Such drastic language is certainly not necessary. If the mobile is transmitting, any receiving station normally understands if it is necessary to go QRT in tight traffic conditions, and vice versa, and any mobile operator soon learns to turn a deaf ear to an incoming signal when occasion warrants. Due apologies can be, and are, made later on so that the requirements of both safety and courtesy are met.

However, this leads to the more important point that the decision whether or not to operate on the move must be made by each individual operator after a sober consideration of his own ability to cope with the problems which may arise. The newcomer to "mobileering" would be well advised to make the first contacts whilst static in order to familiarize himself with his equipment, and to proceed from that to making QSOs on an empty road before trying to operate in traffic. Needless to say, a careful study of the Society's safety recommendations will pay dividends. It is not the problems of mobile operation that lead to danger so much as a failure to be aware of them. The man causes the accident, not the machine!

Woburn Abbey Rally

This ever-popular fixture in the Society's calendar was held by kind permission of His Grace, The Duke of Bedford, on September 12 at the usual site in Woburn Abbey grounds and was extremely well supported despite a none too encouraging weather report. This seems to be a family affair with many attractions for all—the stately home with the " mostest ": many and varied sideshows for the children, and a very good opportunity for the OMs to get together without too rigorous a drive from home and back for many locations!

During the morning and early afternoon members of Verulam Radio Society were kept busy, talking-in the arriving mobiles from GB3RS on 160, 80, 4 and 2m, the equipment for the latter station being kindly loaned by J-Beam Aerials Ltd. When the writer arrived at lunch-time the 160m frequency sounded rather as if a contest was in progress so fast were QSOs being made!

Strategically sited near the signing-in table, members of the Mobile Committee were doing a good trade in raffle tickets for the prize draw, and Fred Parker, G3FUR was acting as announcer. In and around the marquee we found the RSGB Bookstall (with " sold out " notices displayed against several items) and trade stalls of KW Electronics, G3JMU, Green Electronic Communications, South London Mobile Society, Daystrom, and J-Beam Aerials.

During the afternoon a potted sports meeting was held for the children and at half-past three the talk-in stations closed down to allow the members of Verulam RS to put on a demonstration of erecting and dismantling their home-designed and built masts. This demonstration showed a very practical method of construction of a pair of 32 ft. masts using easily available materials. The erection drill was carried out in an easy manner by teams of four to the accompaniment of a suitably amusing commentary. One mast went up in just over 9 minutes, the other in 15 and both without the background of blood, sweat and tears which so often makes a bad start to NFD! Incidentally, this society has offered to give details of these masts to anyone interested. The demonstration was followed by the Prize Draw and then the crowd started to make for home, G3FUR being kept busy calling for various members of families " adrift " to get back to their cars. Other members of the Mobile Committee put their backs into the task of dismantling all sorts of equipment, having once again organized a very satisfying rally.

* 1 Shortbutts Lane, Lichfield, Staffs.

Rally Report

Despite a showery day the sixth **North-East Mobile Rally** organized by South Shields and District ARS was a successful event and about 200 people attended at Bents Park. This rally featured a good number of competitions and tests of skill and knowledge for adults and children and a total of 70 prizes was distributed during the day. A prize for the visitor attending from the longest distance went to G3MQT, who came from Hastings and returned there, making a total of 716 miles in 36 hours!

G3NEC (Heddon on the Wall) won both the motor obstacle course and the parking competitions, while G3LCZ /M (Stockton on Tees) carried off the prize for mobile operators. This event was judged on the answers to a quiz on various aspects of mobile operation, G3RIX won a visual radio quiz in which contestants were faced with solving various visual/pictorial puzzles, such as the gauges of wires, value of a resistance network, frequency of a tuned circuit, identifying parts of radio components, etc. Children had various obstacle races and there was the usual prize draw.

The eighth **Derby Mobile Rally** held at Ryknеld School and ganised by a Committee of Derby and District ARS under the chairmanship of G3FGY was well attended and nearly 500 cars, over half of which were mobile-equipped, just about filled the parks. New items of interest were mainly for children and included a model railway (which did good business giving rides to junior ops) set up by the Derby Locomotive Works Society of Model Engineers, and a " Scalextric " model car racing circuit. Members of Derby Model Aeroplane Club and Rolls Royce Aeronautical Society flew their radio controlled models for a good proportion of the afternoon.

The RSGB Bookstall, much enlarged this year, proved to be a very great success and the demand for several items resulted in a sell-out! The Mobile Contest, the nature of which is usually kept as a surprise, turned out to be a quiz on contestants' equipment and operation and was won by G3HRP/M of Bottesford.

Prior to the huge junk sale, the " Decoys," a local pop group gave a 2-hour performance for singing, dancing, jiving —or just listening. A wide variety of prizes ranging from a washing machine to a Stilton cheese was offered in the prize draw which is a major feature of this rally, and over 40 were distributed. The holder of blue ticket number 690 did not claim his prize, and should contact G3FGY. Rounding off the day the children were entertained with various films and a distribution of balloons and novelties.

Talk-in stations G3ERD/A on 160m and G2DJ/A on 2m were kept busy guiding mobiles in. Although the figures are not available, the writer's impression is that far from decreasing, the proportion of mobiles operating on 160m is greater than ever. There seems to have been a modest increase in the number of mobiles operating s.s.b.

Trade stands by J & A Tweedy Ltd., Green Electronic Communications Ltd., Taurus Electric Services and G3ABG attracted the attention of most visitors, and Derby Borough Police display was based on the road safety theme of " Think Ahead." Thanks are also due to members of Derby Red Cross Society, who were on hand to give any assistance required.

G3PQR taking part in the timed car trials at the South Shields rally.
(Photo by G3MZC)

Right: **One member of the South London Mobile Club convoy arriving at the entrance to the Woburn car park.**
(Photo by G3LXP)

Brian Cockell directs new arrivals to the car park at Woburn.
(Photo by G3RPA)

An enthusiastic crowd at the monster Derby junk sale.
(Photo by G3NMR)

G3RJI apparently has a duck billed platypus in his bubble car besides 2m gear (seen at Woburn).
(Photo by G3RPA)

One of the four car parks at Derby.
(Photo by G2CVV)

The Power Rating of Single Sideband Transmitters

By R. F. STEVENS, G2BVN *

THE existing method of measurement of power for amateur s.s.b. operation, which was agreed between the GPO and the RSGB in 1954, has been published in the BULLETIN on many occasions and in the *Amateur Radio Handbook*. This regulation is considered to be perfectly clear and a power measurement undertaken exactly as stated would result in an allowable p.e.p. r.f. output of 400 watts which is also the output obtained at the crest of modulation from a fully modulated a.m. transmitter working at an overall efficiency of 66 per cent with a d.c. input of 150 watts.

In order to conform, however, with the method hitherto recommended it is necessary that:

(i) the bias to the output stage of the transmitter shall be capable of considerable variation, i.e. up to twice the amount of the bias normally applied for linear operation;

(ii) the loading capacitor of the transmitter output stage shall also be capable of considerable variation, i.e. down to less than half the capacity normally employed, in order to provide optimum operating conditions for the differing valve load line.

Practical difficulties with these requirements are:

(a) not one of the commercial sideband transmitters or linear amplifiers now available in the UK incorporates sufficient bias adjustment facility to enable the class of operation to be altered to class C;

(b) in many cases transmitter output stages are designed to work into 52 or 75 ohm loads and therefore incorporate fixed loading capacitors. This is the case with several commercial transmitters.

There has also been some misunderstanding regarding the alteration of the class of operation of the transmitter output stage to conform with the requirements of the different modes.

In order to clarify the position for the future, the GPO has agreed to the adoption of an alternative method of power measurement which is detailed in an official announcement shortly to be published in the *London Gazette*.

Output Power of a S.S.B. Transmitter using a Two Tone Test Input

50 ohm dummy load (R)			75 ohm dummy load (R)		
Current (I) (amps)	Mean Power output (watts)	P.E.P. output (watts)	Current (I) (amps)	Mean Power output (watts)	P.E.P. output (watts)
0·5	12·5	25	0·5	19	38
1·0	50·0	100	1·0	75	150
1·5	112·5	225	1·5	168·75	337·5
2·0	200	400	1·63	200	400

The mean r.f. output power of 200 watts, specified therein, which is equivalent to 400 watts p.e.p. output when using a two tone test signal, can be measured with an r.f. ammeter in series with a resistive dummy load of known value. The power dissipated in the load is $I^2 R$; i.e. the current squared multiplied by the value (in ohms) of the load, therefore the current in a 75 ohm load when running at maximum allowable output will be 1·63 amps. For a load of 50 ohms the current will be 2·0 amps, and other current readings can readily be converted to mean output power by the formula given above.

*Chairman, Technical Committee.

†For example, the Morganite type 701.

The advantages of the above system are:

(i) It is not necessary to alter either the operating bias or the loading capacitor from the normal operating position;

(ii) the modulation envelope can be observed under maximum signal conditions, and it may be checked that the amplifier is in fact operating in a linear manner with low distortion;

(iii) non-inductive dummy loads of suitable values and wattage dissipation† are available in the UK, and, if required, wattmeters of high accuracy may be obtained;

(iv) a suitable ammeter for use in this procedure can readily be obtained, and the accuracy may be checked by connecting this in series with another meter of known performance;

(v) the deflection on the oscilloscope used in conjunction with dummy load and r.f. ammeter will represent the maximum allowable output and when the two tone input is replaced by speech this deflection must not be exceeded.

The General Post Office stand at the RSGB International Radio Communications Exhibition will include a feature on s.s.b. power measurement, with a working demonstration of the method of output power measurement, together with explanatory material and literature setting out the terms of the revised schedules to the licences with technical comments on the method of measurement.

The writer, on behalf of the Society, would like to express appreciation of the co-operation of the Engineering Department of the GPO during the discussions which have taken place on this matter.

Extract from the revised licence conditions governing s.s.b. operation

Suppressed or reduced carrier single sideband systems

The radio frequency output peak envelope power under linear operation from an A3A or A3J transmitter must not exceed that from an A3 transmitter working at an overall efficiency of 66 per cent when supplied with the appropriate maximum permitted d.c. input. The output power shall be measured, using an oscilloscope, by the following process:

(i) Adjust the A3 transmitter output stage for class C working and apply a pure sinusoidal tone to the transmitter. With the d.c. input power limited to the maximum value appropriate to the frequency band concerned note the peak-to-peak deflection on the cathode-ray oscilloscope.

(ii) Adjust the transmitter for single sideband linear operation and replace the tone by speech; the maximum deflection on the cathode-ray oscilloscope, showing the r.f. output caused by the peaks of speech, should not be greater than twice the previously measured deflection obtained with tone input.

As an alternative the following method may be used:

Suppressed or reduced carrier single sideband operation.

The radio frequency output peak envelope power must not exceed that from an A3 transmitter working at an overall efficiency of 66 per cent when supplied with the appropriate maximum permitted d.c. input power. The output power shall be measured, using a resistive dummy load, r.f. am-

Amateur (Sound) Licence A Revised Schedule

Footnote No.	Frequency Bands (In Mc/s) (See A below)	Classes of Emission (see B)	Power	
			Maximum D.C. Input Power (see C and D)	Radio Frequency Output Peak Envelope Power for A3A and A3J emissions only (see D)
1 and 5	1·8– 2	A1, A2, A3 A3A, A3H, A3J, F1, F2 and F3	10 watts	26⅔ watts
2	3·5– 3·8		150 watts	400 watts
	7– 7·10 14– 14·35 21– 21·45 28– 29·7			
1 and 3	70·1– 70·7		50 watts	133⅓ watts
1, 4 & 6	144– 145		150 watts	400 watts
6	145– 146			
1 1 1 1 1 1	420– 450 1215– 1325 2300– 2450 3400– 3475 5650– 5850 10000–10500			
	21000–22000			
1 1 1	2350– 2400 5700– 5800 10050–10450	P1D, P2D, P2E, P3D and P3E	25 watts mean power and 2·5 kilowatts peak power	—
	21150–21850			

A. Except as provided in Footnote 6 below, artificial satellites may not be used by stations in the Amateur Service.

Footnotes

1. This band is allocated to stations in the amateur service on a secondary basis on condition that they shall not cause interference to other services.
2. This band is shared by other services.
3. This band is available to amateurs *until further notice* provided that (i) only the frequency 70·375 Mc/s ± 25 kc/s shall be used for the purposes mentioned in Clause 1 (1) (c) of this Licence; (ii) frequencies between 70·1-70·3 Mc/s inclusive and 70·5-70·7 Mc/s inclusive shall not be used on the North West side of the Line Firth of Lorne to the Moray Firth; and (iii) use by the Licensee of *any* frequency in the band shall cease immediately on the demand of a Government official.
4. The following spot aeronautical frequencies must be avoided *whenever* the band is used: 144·0, 144·09, 144·18, 144·27, 144·36, 144·45, 144·54, 144·63, 144·72, 144·81 and 144·9 Mc/s.
5. The type of transmission known as Radio Teleprinter (RTTY) may not be used in this band.
6. In the band 144-146 Mc/s artificial satellites may be used by stations in the amateur service.

B. The symbols used to designate the classes of emission have the meanings assigned to them in the Telecommunication Convention. They are:

Amplitude Modulation

A1. Telegraphy by on-off keying, without the use of a modulating audio frequency.
A2. Telegraphy by on-off keying of an amplitude-modulating audio frequency or frequencies, or by on-off keying of the modulated emission.
A3. Telephony, double sideband.
A3A. Telephony, single sideband, reduced carrier.
A3H. Telephony, single sideband, full carrier.
A3J. Telephony, single sideband, suppressed carrier.

Frequency (or phase) Modulation

F1. Telegraphy by frequency shift keying without the use of a modulating audio frequency, one of the two frequencies being emitted at any instant.
F2. Telegraphy by on-off keying of a frequency-modulating audio frequency or on-off keying of a frequency modulated emission.
F3. Telephony.

Pulse Modulation

P1D. Telegraphy by on-off keying of a pulsed carrier without the use of a modulating audio frequency.
P2D. Telegraphy by on-off keying of a modulating audio frequency or frequenices or by on-off keying of a modulated pulsed carrier—the audio frequency or frequencies modulating the amplitude of the pulses.
P2E. Telegraphy by on-off keying of a modulating audio frequency or frequencies or by on-off keying of a modulated pulsed carrier—the audio frequency or frequencies modulating the width (or duration) of the pulses.
P3D. Telephony, amplitude modulated pulses.
P3E. Telephony, width (or duration) modulated pulses.

C. D.C. input power is the total direct current power input to (i) the anode circuit of the valve(s) or (ii) any other device energizing the aerial.

D. As an alternative, for A3A and A3J single sideband types of emission, the power shall be determined by the peak envelope power (p.e.p.) under linear operation. The radio frequency output peak envelope power under linear operation shall be limited to 2·667 times the d.c. input power appropriate to the frequency band concerned. This column gives the maximum power determined by this method which may be used.

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meter or voltmeter and oscilloscope, by the following method:

(i) Apply two non-harmonically related sinusoidal tones* of equal amplitude to the s.s.b. transmitter, with the carrier fully suppressed, and adjust the input power to give a mean radio frequency output power under linear operationof 200 watts (see Note 1) when measured into a resistive load by means of an r.f. meter (see Note 2). Under this condition note the peak-to-peak deflection on the cathode-ray oscilloscope (see Note 3).

(ii) Replace the tone by speech; the maximum vertical deflection on the cathode-ray oscilloscope shall not be greater than the previously recorded deflection obtained with the two-tone input.

Note (1) 200 watts mean radio frequency output power in the case of those bands limited to a maximum d.c. input power of 150 watts; 66⅔ and 13⅓ watts for those bands limited to a maximum d.c. input power of 50 watts and 10 watts respectively.

Note (2) In the case of v.h.f. and u.h.f. measurements the r.f. meter may be replaced by a crystal rectifier and calibrated meter; for s.h.f. measurements a bolometer may be used.

Note (3) In the case of v.h.f., u.h.f. and s.h.f. measurements, this use of an oscilloscope may not be practical. In this case the test may be limited to a measurement of the mean radio frequency output power as outlined in part (i) of the procedure.

* A suitable oscillator is shown on page 648.

NFD 1965 SCORES

A FULL REPORT WILL BE PUBLISHED NEXT MONTH

Posn.	Group	Call-sign(s) A Stn.*	B Stn.	1·8 Mc/s	3·5 Mc/s	7 Mc/s	14 Mc/s	21 Mc/s	28 Mc/s	Total
1	Cardiff Group	GW5BI*	GW4FW	475*	493	396	533*	259*	—	2156
2	Oxford & District Amateur Radio Society	G2DU*	G8PX	320*	493	500*	431	276*	74	2094
3	Croydon Group	G3BFP*	G6LX	326*	428	323*	519	220*	55	1871
4	Cannock Chase Amateur Radio Society	G3ABG*	G4CP	304*	489	334*	528	144*	50	1849
5	Belfast & District Group	GI3JXS*	GI2KR	303*	389	248*	596	277*	4	1817
6	Pontypool Group	GW3RNH*	GW3NOP	484*	384	311*	231	235*	17	1662
7	Ayrshire Group	GM5KF	GM4QK	500*	349	325*	324	143*	2	1643
8	Guildford & District Radio Society	G3KMO*	G3TLM	328*	476	391*	215	144*	65	1619
9	Durham City & South Shields & District Amateur Radio Societies	G3SOI*	G3DDI	300*	459	300*	344	207*	—	1610
10	Reigate Amateur Transmitting Society	G3FM*	G3REI	333*	451*	210	321	214*	6	1535
11	Ariel Group	G3AYC*	G3GDT	286*	410	247	349*	198*	43	1533
12	Wirral Amateur Radio Society	G2AMV*	G8BM	283*	207	287*	587	154*	—	1518
13	Lymington & District Amateur Radio Society	G2DC*	G3JAF	257*	433	280*	285	201*	42	1498
14	Radio Society of Harrow	G3EFX*	G3HBR	254*	453	286*	285	159*	35	1472
15	City & County of Bristol Group	G3RQ*	G6GN	278*	433	274*	258	157	45*	1445
16	Chelmsford Group	G5RV*	G4VF	350*	542	417*	75	40	16*	1440
17	Norwich & District Radio Club & Norfolk Amateur Radio Club	G2YG*	G3IOR	211*	491	287*	398	—*	48	1435
18	Crawley Amateur Radio Club	G2DP*	G3TR	251*	347*	388	214	182*	12	1394
19	Weston-super-Mare Group	G5DV*	G8FC	243*	378	179*	431	109*	48	1388
20	Macclesfield & District Radio Society	G3CDT*	G3MKR	280*	385	198	406*	117*	—	1386
21	Coulsdon & Caterham Group	G2AJS*	G3DVQ	359*	431	325*	162	60	45*	1382
22	Lothians Radio Society	GM3UM*	GM3HAM	377*	337	232*	138	233*	2	1319
23	Edgware Group	G3VW*	G5FG	258*	433	217*	135	225*	48	1316
24	Torbay Amateur Radio Society	G3GDW*	G3NJA	317*	268	302*	292	132*	—	1311
25	North Notts Amateur Radio Society	G3RCW*	G3OZN	340*	464	312*	120	74*	—	1310
26	Stroud District Radio Club	G3SZS*	G3SDR	277*	433	343	157	81*	—	1291
26	Verulam Amateur Radio Club	G3STA*	G2AIA	266*	426	247*	207	114	31*	1291
28	Chiltern Amateur Radio Club	G5WW*	G3BXS	235*	314	219*	314	132*	46	1260
29	Derby & District Amateur Radio Society	G3ERD*	G2DJ	286*	389	224*	158	115*	38	1210
30	Bury & Rossendale Group	G2GA*	G3BRS	264*	442	93*	281	104	—*	1184
31	Purley & District Radio Club	G3OVL*	G3FTQ	241*	387	268*	234	38*	—	1168
32	East Molesey Group	G5LC*	G8SM	260*	420*	234	176	26	—*	1116
33	Bedford & District Amateur Radio Club	G3NEU*	G3ATI	216*	436	183*	258	13*	—	1106
34	Dorking & District Radio Society	G3CZU*	G3AEZ	296*	302	28	390*	78	—*	1094
35	Caithness Amateur Radio Society	GM3COV*	GM3GUJ	134*	131	310*	469	44*	—	1088
36	East Worcestershire Amateur Radio Group	G3EVT*	G3HCT	220*	441	110*	137	148*	—	1056
37	Clifton Amateur Radio Society	G3GHN*	G3JKY	238*	337	230	157*	87*	—	1049
38	Basingstoke Amateur Radio Club	G3TCR*	G3ITF	249*	384	209*	90	52*	64	1048
39	Chorley & Leyland Group	G3RFT*	G3GGS	276*	365	142*	218	35*	6	1042
40	Grimsby Amateur Radio Society	G4XC*	G4GX	163*	424	290*	101	50*	6	1034
41	Chester Group	G3ATZ*	G3EWZ	341*	448	65*	172	2*	—	1028
†	West Hartlepool & District & Darlington & District Groups	G3AWL*	G2CKN	158*	237	366*	122	128*	—	1011
42	Loughborough Amateur Radio Club	G3RAC*	G4BI	181*	313	208*	176	108*	—	986
43	Ilford Group	G3HIW*	G6AH	275*	444	138*	88	28*	—	973
44	Portsmouth & District Radio Society	G6NZ*	G3DIT	348*	333*	150	49	64	—*	944
45	Liverpool & District Amateur Radio Society	G3AHD*	G8DI	252*	166*	319	175	16*	—	928
46	Scarborough Amateur Radio Society	G8KU*	G4BP	192*	319	184*	166	56*	—	917
‡	Enfield & District Group	G3RPB*	G3FD	300*	275	309*	26	—	—	910
47	Leicester Radio Society	G3LRS*	G3PBC	365*	312	40	115*	66	—*	898
‡	Amateur Radio Club of Nottingham	G3MP*	G6CW	266*	278	164*	99	71*	1	879
48	North Kent Radio Society	G3OFM*	G6HD	243*	319	131*	88	98*	—	879
49	East Kent Radio Society	G3LTY*	G4WK	227*	171*	213	137	70	—*	818
50	Ainsdale Radio Club	G2CIP*	G2CUZ	191*	387	111*	46	76*	—	811
51	Royal Signals, Catterick	G3CIO*	G3EJF	227*	217*	195	106	59	—*	804
52	Cray Valley Radio Society	G3RCV*	G2MI	286*	305	40*	129	—*	—	760
53	Blackpool Group	G8GG*	G5ND	275*	210	130*	137	6*	—	758
54	Mid Lanark Group	GM3IWV*	GM3NRP	156*	186*	239	56	108	—*	745
55	Slough Group	G3AHB*	G2XA	139*	383*	160	44	15*	—	741
56	Ballymena Radio Club	GI3FFF*	GI3RNY	149*	87	284*	144	66*	—	730
§	Stevenage & District Amateur Radio Club	G3SAD*	G3RTJ	363*	142	155	54	14	—	728
57	Glenrothes Radio Club	GM3OBC*	GM3PFQ	235*	184	272*	14	19*	—	724
58	Harlow & District Radio Society	G3ERN*	G3NIS	203*	197	213*	—	23*	—	636
‡	RSGB Group	GW3RSR*	GW3OHM	585*	18	10*	—	—	—	613
59	Manchester & District Amateur Radio Society	G3HOX*	G3IOA	34*	203*	113	201	8	—*	559
60	Stoke on Trent Amateur Radio Society	G3GBU*	G3UD	—*	223*	—*	310	13	—	546
61	Glasgow City Group	GM3SSB*	GM3GIJ	117*	188	195	26*	—	—*	526
62	RSGB Glasgow Group	GM3UCI*	GM6IS	—*	204	143*	172	—*	—	519
‡	Dundee Group	GM3EUV*	GM4HR	48*	102	161*	72	4*	10	397
63	Newbury & District Amateur Radio Society	G3LLK*	G3JMT	134*	243	—	—	—	—	377

† Late Entry—Rule 20.

‡ No operators call-signs shown on log sheets—Rule 19.

§ Claimed score only—separate logs not submitted—Rule 20.

Single Station Entries

Posn.	Group	Call-sign	1·8 Mc/s	3·5 Mc/s	7 Mc/s	14 Mc/s	21 Mc/s	28 Mc/s	Total
1	Maidstone YMCA	G3TRF		348	535	284			1167
2	KW Radio Club	G8KW		385	238	460			1083
3	Stourbridge & District Amateur Radio Society	G6OI		370	398	307			1075
4	Gravesend Amateur Radio Society	G6BQ		358	302	387			1047
5	Stean Group	G8NF	319	444		279			1042
*	Wolverton District Radio Club	G4CK	226	478	319				1023
6	Stockport Radio Society	G3NBN	267	445	309				1021
7	Basildon & District Amateur Radio Society	G3OIT	309	447	242				998
8	Bristol Amateur Radio Club	G4UZ	166	393	412				971
9	Exeter Group	G3ID			181	677	78		936
10	Blackwood Amateur Radio Society	GW6GW	503	165		240			908
11	Crystal Palace & District Radio Club	G3OOU	230	300	337				867
12	Bagshot & District Radio Society	G2BB	223	370	251				844
13	Cheltenham Group	G3CGD	361	338	129				828
14	Sutton & Cheam Amateur Radio Society	G8DF	272	341	208				821
15	Southgate, Finchley & District Group	G5FA	248	365	202				815
16	Pye Telecommunications Amateur Radio Club	G5PI	149	474	157				780
17	City of Belfast YMCA Radio Club	GI6YM	312	106		329			747
18	Gloucester Group	G3MA	259	329	141				729
19	Luton & District Amateur Radio Society	G3KAA	190	265	239				694
20	Cheltenham Amateur Radio Society	G5BK	270	350	71				691
21	AERE Harwell Amateur Radio Club	G3PIA		330	298	57			685
22	Conway Valley Amateur Radio Club	GW5WO	270	232	178				680
23	Midland Amateur Radio Society	G3MAR	272	177	206				655
24	West Hartlepool & District Group	G3AWL	158		366		128		652
25	Lincoln Short Wave Club	G4BU	220		335		92		647
26	Worcester & District Amateur Radio Club	G3NUE	364	280					644
27	Moray Firth Amateur Radio Society	GM3TKV	189		162	277			628
28	Gravesend RSGB Group	G3SXZ	309				199	105	613
29	Chingford Group	G3NQT		356	80	171			607
*	Newark Shortwave Club	G3UEB	266	139		198			603
30	Newark & District Amateur Radio Society	G3EVG	161	328	113				602
31	Larbert Group	GM3OM	371	219					590
32	Retford Group	G3BTU	188	191	204				583
33	Great Yarmouth & District Amateur Radio Club	G3SEP	—	254	278	46			578
34	Bury St. Edmunds Group	G3IRM	218	319	39				576
35	Dursley & District Amateur Radio Society	G3ILO	163	331	74				568
†	Haverhill & District Amateur Radio Club	G3TGA	170	303		85			558
36	Plymouth Radio Club	G3PRC	—	188	174	194			556
37	Norwood & South London Group	G2VB	—	321	67	165			553
38	West Kent Amateur Radio Society	G2UJ		210	174	168			552
39	Loughton & District Radio Society	G8AB	—	533	—				533
40	Loddon Valley Contest Club	G3PGM	323	207					530
41	Hull & District Amateur Radio Society	G3AMW	299		89	141			529
42	Bath Spa Radio Club	G3IVL	214	203		104			521
*	Swindon & District Amateur Radio Club	G2BRR		409	94	16			519
43	Grantham & District Amateur Radio Society	G3OWR	265	244	4				513
44	Southport Radio Society	G2ART	176	275	49				500
45	Shefford & District Amateur Radio Society	G2DPQ	219	241	30				490
46	EMI (Wells) Sports & Social Club	G3ORA	89	238		162			489
47	Skegness & District Group	G2FT	230	181	69				480
48	Isle of Thanet	G2IC	225	240	13				478
49	Carmarthen Amateur Radio Society	GW8MQ	295	177					472
50	Southend & District Radio Society	G5QK	145	251	52				448
51	Reading Amateur Radio Club	G5HZ	275	134	32				441
*	Bradford Radio Society	G3NN	270	96	66				432
52	Ilminster Grammar School Amateur Radio Society	G3IGS	156	197	73				426
53	Scunthorpe Amateur Radio Club	G3MSB		248	105	64			417
*	Southampton Group	G3SOU	106	235	45				386
54	Henley-in-Ardren & District Group	G3SIA	199	182					381
55	South Dorset Radio Society	G3SDS	33	275	70				378
56	Northern Polytechnic Amateur Radio Society	G3HNR		209	58	88			355
†	Worthing & District Amateur Radio Club	G3IWL	102	227	19				348
57	Colchester Group	G3RZP		280	53	14			347
58	Stratford-on-Avon & District Radio Club	G3PGU		254	56	28			338
59	Sheffield Amateur Radio Club	G8NN		220	37	67			324
60	Eccles & District Amateur Radio Club	G3GXI		113	149	50			312
*	Preston Amateur Radio Society	G3KUE	13	230		58			301
61	Salisbury & District Short Wave Club	G3FKF	110	185					295
*	Peterborough & District Amateur Radio Society	G3DOW	127	122		38			287
62	Ashford Amateur Radio Club	G2QT		3	111	163			277
63	Havering & District Amateur Radio Club	G3TTB	108	162					270
†	Northern Heights Amateur Radio Society	G2SU	217	50					267
*	Sunderland Technical College Amateur Radio Society	G2STC	—	9	171				180
64	Bishop Rawstone School	GB3BRS	78	45					123

* No operator's call-signs shown on log sheets.

† Claimed score only, separate logs not submitted.

THE MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By M. E. BAZLEY, G3HDA*

CONTESTS! Contests! Contests! From the middle of September until the spring nearly every weekend a contest will be in full swing on the amateur bands, and occasionally two such contests will be run simultaneously, one on phone and the other on c.w. To the weekend operator who comes on to the bands for an odd contact with a DX station, his hobby is ruined unless he is contest minded. Gone are the days ten years ago when only the major contests appeared seven or eight times a year and they were tolerated because they were another facet of our unique hobby. Now contests seem to be a way of promoting a National Society and it seems that everyone has jumped on the band-wagon with the inevitable result that even the "dyed in the wool" contest man is finding it too much. It would be wrong to eliminate them entirely because contests do have their place in Amateur Radio, previously besides exchanging numbers there was always a doubt whether the home-built gear would function for a 48 hour non-stop period, but with more commercial gear being used this reason is virtually eliminated. During major contests the neglected bands become happy hunting grounds for DX. Surely a purpose for contests now would be to run them only on bands which are in the DX doldrums, vide the RSGB 21/28 Mc/s contest, which does provide activity on these little-used bands during the present minimum of the sunspot cycle. If contests are to continue in their present form then in fairness to others they must be cut in length (say 24 hours maximum) and frequency sharing should be adopted.

Top Band News

The **1965/66 Transatlantic and World Wide DX Tests** will be held on the following Sunday mornings between **05.00 and 07.30: December 5 and 19; January 2 and 16; February 6 and 20.** USA and Canadian stations should call CQ DX test during the first five minutes of the hour, and then the third, fifth, etc., periods. DX stations will call during the second, fourth, sixth, etc., five minute periods. The operating frequencies are: East Coast W/VE, 1800/1825 kc/s; West Coast W, 1975/2000 kc/s; Europe 1825/1830 kc/s; VK 1800/1860 kc/s; JAs on the spot frequency of 1880 kc/s and Africa mostly on 1800/1825 kc/s.

Further to a note under this heading in the May BULLETIN, special "first timers" tests have been arranged for this coming season and the dates are as follows: for European and African stations, December 19 and February 6, and North Americans, January 9 and March 7. Stations in Europe who have made QSOs across to the States are asked to please co-operate by not taking part in these tests on December 19 and February 6, so as to give some other Europeans the pleasure of their first W/VE QSO. Times, frequencies are the same as for the regular transatlantic tests. To compensate for missing the two dates there is the opportunity of working new W contacts on January 9 and March 6.

4U1ITU (operated by G3OOH and HB9CM) made 150 QSOs on Top Band during May 15/17 with ten European countries and VO1FB. Further activity is promised by these two operators during the coming winter DX season (Tks W1BB).

The International 160 Society, which has been formed to promote Top Band interest has sent KH6FHO a Top Band rig and he has promised to be active this coming DX season as does KL7JDO. UK membership of the society is 15s. per annum and there is a thriving s.w.l. section. Enquiries should go to G3SED who is the UK director.

Apologies to the Torbay Amateur Radio Club for mis-printing their call in the August BULLETIN. A letter from **VO1FB** points out the mistake and confirms that the only NFD station he contacted was G3GDW/P. John, VO1FB, goes on to say that there was an excellent opening into the UK on September 11 from 22.55 until 23.45 when half a dozen G stations were worked. Activity now seems to be increasing and the summer QRN level dropping.

W1BB sends further items of interest concerning G3RAU who was on board ship outside the mouth of the Amazon River on August 30 and heard ZE1AZD's (beacon station) one watt signal at 4/5-5-9 and DHJ at 459.

As there are more Top Band reports this month the writer has decided to put them with the Top Band news and hopes that this arrangement meets with general approval.

1·8 Mc/s C.W.: OL2AAI (18.48), PA0CD (22.49), VE2UQ (03.36-04.30), VO1FB (02.55), VO2FB (02.00), W1BB/1 (03.00-04.50), W1HGT (03.02-04.50), W1MO (04.57), K1KPW (04.53-05.30), W2AFC (04.30), W2EQS (05.20), W8BG (04.55).

Many thanks to the following without whose help these Top Band news items could not have been written. G3EUE, G3SED, VO1FB, W1BB, A3942, A4489 and A4776.

News from Overseas

News from the Faeroe Islands is kindly supplied by **OY7ML** through the medium of the Faeroe Radio Society *Bulletin*. The OY Society now has 44 members of which 32 are currently licensed, surely giving them the highest amateur

There is nothing like starting them young, one year old Lisa Snyder QLF!

* Please send all reports and news items to RSGB Headquarters to arrive not later than **October 8** for the **November** issue, and **November 11** for the **December** issue.

ZL3VB, Ian Johnson operating from Chatham Island during the recent DXpedition there. Ian, who is ex-ZL1ABZ and ZL4JF, will next be heard from ZL5, New Zealand Antarctica. The view on the left could be seen from his shack.

to population ratio in the world. Activity during the major contests is promised from the club station **OY6FRA.** Stations who require an OY contact may like to note that OYs meet every Sunday morning at 10.00 on 3500/3505 kc/s and at that time European stations are regularly heard.

G3PCY, ex-5N2AAC is another Nigerian amateur who has recently returned to the UK and as he remarks, it is getting harder to qualify for the 5N2 award as 5N2KOB seems to be the only active amateur on at present.

US amateurs in Greenland are loosing their KG1 call signs as these will now be changed to calls in the OX4AA-OX5ZZ series. Two special MARS stations will have the amateur band calls of XP1AA and XP1AB.

9M4JW writes to say that he is holding cards for the following stations: VS1FE, VS4WS, ZC5AE, 5AK, 5AM, 5AP, 5CA, 5CS, 5CT, 5FF, 5FS, 5MO and ZC5QU. Anyone wishing to claim their cards may do so by dropping him a note of their present whereabouts, otherwise the QSL's will reluctantly be destroyed. 9M4JWs QTH will be found in QTH Corner.

Activity from Gibraltar must be nearing an all time high level with ZB2A, AG, AJ, AL, AM, AN, AO and AP at present all operative. **ZB2AM,** who is ex-G3JFF is very active on all bands and particularly on 14,050 kc/s c.w., 14,220/250 kc/s s.s.b. using a KW2000 and G5RV aerial. In three months activity over 1800 contacts have been made in 91 countries. All QSLs via W1HGT. **ZB2AP** (ex-GI3SLI) is active on the h.f. bands with 120 watts to a G5RV on c.w. and a.m. and requests all QSLs via W2CTN. **ZB2AO** is using a Courier transceiver with success on 80m s.s.b. together with stacks of contacts on 20m. Dick hopes to be on 3782 kc/s from 22.30 most weekends this coming winter. Top Band operation is also promised this winter by ZB2AJ, 2AM and 2AO. (Tks ZB2AM and ZB2AO).

G3RYZ, who is now active from Malaysia with the call **9M2BM,** is always on the look-out for G contacts but up to the time of writing had only managed five. 9M2BM, who is active on 20m c.w. using 120 watts to a ground plane, would welcome reports on his signals from s.w.l.'s.

Bob Milton, now back in the UK after his tour of duty in the Far East, would like anyone (s.w.l.'s included) who has not received a QSL for QSOs to contact him at: 12 Bank Lane, Warton, Preston, Lancs. The calls Bob used are: VS1LX, 9M4LX, 9M6LX, VS5LX, ZC5AJ and VS9MG. Bob would also like to work old friends and new on all bands as G3OEV.

S.w.l. news from Thailand is supplied by Mike Dransfield, **5N2JKO,** who is at present limited to listening facilities in Srisamrong. In Thailand the bands are dominated by JA, UA0, 9M, VU and KR6 stations as one would expect, but contrary to expectations, there are very few VKs and ZLs to be heard even at peak operating times for these areas. Neither are the bands full of rare and exotic Pacific calls. On 10m, JAs are frequently heard, while on 15m, besides JAs, East and Central Africa is heard from 08.00-12.00 and Eastern Europe from 08.00-11.00 and up to the present the only G heard has been G4PX. On 20m Mike says that the skip starts to lengthen across Europe from 12.00 until about 14.30 when the Gs, Fs and EAs start coming through. Mike comments on the amazing number of different Asian stations heard and gives as an example 55 different VU stations logged in the past six weeks. Tne South East Asia net is active on 14,320 kc/s at 12.00 every day and they are thinking of having a net on 7045 kc/s around 15.00-16.00. Mike hopes to be returning to Nigeria in seven weeks time when no doubt 5N2JKO will once again be a familiar signal.

According to the official station of the ARRL, W1AW, **Singapore** resumes its former status in DXCC which means those having former credit need not re-apply.

Band Activities

The past month has brought increased activity on to the l.f. bands and on occasions 20m has been void of signals during the night, a sure indication that the winter DX season is approaching. DX activity on 80m has been helped along by the all Asian and WAE contests and it seems as if it is beginning to settle down to its normal winter pattern. The DX available on 40m s.s.b. and c.w., as can be seen by the lists, is substantial. The 40m. s.s.b. European/Africa net run by GW3AX on 7045 kc/s (20.00/21.30) is producing some rewarding contacts, whilst on c.w. DX is being worked from 17.00 until 08.00. On 20m, as one would expect, world wide contacts are nearly always available and 15m has provided on occasions some really good DX openings, the best of these occurred during the WAE phone contest. Many thanks to the following for providing this month's lists of DX heard and worked from the UK: G2BOZ, G2LB, G2RO, G3AAE, G3FKM, G3HCT, G3KSH, G3NOM, G3SML, G3SYC, G3TMN, G3UML, G4MJ, G8JM, GM3UBT, GW3AX, BRS20317, BRS22844, BRS25600, A3492, A3699, A4134, A4311, A4489 and A4631.

3·5 Mc/s C.W.: PY1BTX (22.45), TF5TP (21.04), UA9KQA (00.45), UD6BD (23.20), UF6LA (22.15), UI8LB (23.00), UL7CT, IP, KDM (19.40-00.45).

3·5 Mc/s S.S.B.: OA4KY (05.35), OX3JV (00.58), VE's (23.00-02.00), VO's (21.00-02.00), YV5ANS (06.13), ZB2AO (00.20), ZC4MO (23.00), ZL2BCG (05.52).

7 Mc/s C.W.: CE2DK (00.30), CR4AB (22.50), CR6AI (19.30), CR6GV (22.15), EP2BQ (17.45), FP8CA (21.59), FP8CP (23.50), HI8RVD (00.15), HK3RQ (06.00), HK7XI (23.20), JA's (16.45-21.10), JY74 (21.45-22.45), KP4BJU (05.15), KV4BU (06.13), KZ5TD (06.00), MP4BBA (21.00), MP4TBO (18.25), OA3PZ (23.20), PY2BZD/0 (Trindade Island 22.20), VE8CO (06.35), VK's (06.00-07.00, 16.30-

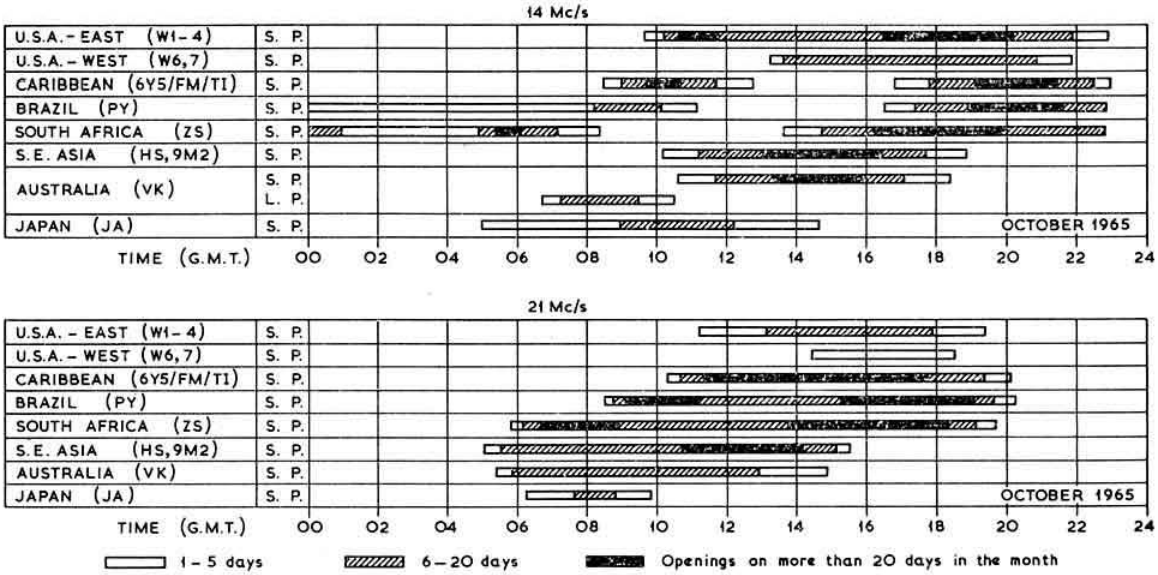
21.20), VP2GAW (22.30), VP4DS (21.50), VP4DU (21.58), VP7NQ (05.00), VQ9J (18.15-23.50), XE1EK (05.40), YJ8WW (05.55), ZD8BC (21.50), ZE1BF (20.30), ZL1OY (06.15), ZL2AWJ (18.00), ZL2GS (05.55), 7G1A (22.18), W9WNV/8F3 (21.23), 9M2OV (21.46), 9M4LP (17.30).

7 Mc/s S.S.B.: The following were active between 20.00-21.15 unless otherwise stated. HK3AYA (06.26), HS1WL, JA2BTV, MP4BBA, MP4BEU, OA4KY (06.40), OX3JV, PJ2AA (23.13), PJ2MI (21.38), PY7AGC, PY7AOT, UW9AF, VK2AVA, VK2DO, VK2KM, VK2SA, VK3IT, VK4AK, VK4BQ, VP4CG (21.38), VP6KL, VS6AJ, XE1CCW (06.22), YA4A, YV4CI (06.43), ZL2BCG (07.00), ZL2WS (07.10), ZS's (19.00-21.30), 4W2AA, 4X1DK, 5A2TR, 5Z4JW, 7Q7PBD, 7X2AH, 9J2WR, 9M2OV, 9M4LP (22.20).

14 Mc/s C.W.: BV1USF (11.30), BV3NO (09.55), BY4SK (13.40), CM2WS (21.47), CO2KG (12.21), CR4BB (20.57), CP5EZ (21.18), FG7XJ (21.00), FU8AG (07.45), HM0HQ (15.05), JY74 (14.00-19.00), KB6CY (27.32), KC6BY (18.30), KC6FM (10.45), KG4AA (20.57), KG6SZ (13.35), KM6CE (08.19), KH6FIF/KS6 (07.30), KX6BQ (09.40), LU1ZC (South Shetlands 19.14), LU4ZC (South Shetlands 19.23), PY2BZD/0 (18.40), PZ1CL (20.46), UPOL13 (06.55), VK9WE (Papua 11.54), VP2GLE (20.52), VP2KJ (21.22), VP2SJ (22.55), VP5GC (Grand Cayman Island 18.56), VR1A (11.00), VR2BZ (07.41), VR2EK (07.50), YJ8WW (07.00), YJ8YY (07.50), ZD8WZ (15.40), ZS2MI (17.00), 4S7DA (16.44), 4W2AA (18.33), 5W1AZ (08.05), W9WNV/8F3 (18.40), 9F3USA (08.40), 9M8FS (15.10), 9M8KS (15.40).

14 Mc/s S.S.B.: CR4AJ (16.25), CR7CO (17.40), CR8AE (14.47), CR9AI (15.48), CR9AK (13.47), DU6TY (14.20), EP3AM (19.22), FG7XX (22.30), FO8AA (07.20), FO8AG (07.31), FP8CA (15.10), FR7ZD (17.00), FY7YL (20.20), HM5BF (14.06), HM0HQ (16.05), HZ1AD (13.23), JY74 (15.04), KA5DG (13.20), KC6FM (10.45), KG4AA (21.47), KG6IF (Marcus Island 09.48), WA7DYP/KH6 (Kure Island 07.50), KJ6's (06.50-08.05), KM6DJ (07.38), KS6's (07.16-09.00), KW6EJ (09.57), KX6's (07.00-10.08 and 20.00), KZ5PH (22.12), MP4TBP (17.05), OA7Z (21.49), PY2BZD/0 (18.30), TI4JP (21.00), TJ1AC (18.40), TU2AA (18.36), UA0YE (Zone 23, 16.23), UA0YP (Zone 23, 14.25), VK9AG (T.N.G. 11.52), VK9DR (Xmas Island 15.25), VK9JA (Norfolk Island 11.15), VK9JO (Cocos Island 14.30), VK9TG (14.55), VK0GW (06.15), VP2GLE (21.00), VP2KJ (16.48), VP2SK (22.37), VP4VP (21.38), VP5GC (20.50), VP6JC (22.15), VS6DS (16.13), VQ9HB (16.46), XE3EB (21.56), YJ8WW (07.41), YK1AA (16.50), ZD5D (17.25), 4S7BR (15.50), 4U1SU (09.59), 4W2AA (14.53), 5T5AD (07.08), 5U7AU (21.07), 5X5IU (20.19), 6Y5RA (22.50), W9WNV/8F3 (16.16), 9K2AM (19.30), 9L1JR (18.59), 9M6AC (14.41), 9M6AP (14.34), 9M6BM (15.32), 9M8KZ

Propagation Predictions



In the Northern Hemisphere during the months of October and November, the F2 m.u.f's reach their highest values. For this reason DX conditions on the two highest frequency bands (21 and 28 Mc/s) are at their best for the year. In spite of the increase in solar activity over that for last autumn, 28 Mc/s is still of little practical use for consistent DX work. At present, on this band and on favourable days, S. America should come through in the period between 10.00 and 18.00 GMT, Africa between 07.30 and 17.00 and S.E. Asia from about 07.30 to 10.30. The season for short skip contacts up to 1,100 miles on 21 and 28 Mc/s came to an end in September. On 21 Mc/s there shuld be an improvement over the summer months in propagation to Eastern N. America as well as to Japan, Western N. America will, however, only come through on exceptional occasions. Generally DX conditions will be more favourable for stations in Southern Europe than for those further North. In contrast to 21 Mc/s, all continents should be workable on 14 Mc/s and in comparison with the summer months on this band traffic with Australia and New Zealand will show a marked improvement. Because of the disappearance of the summertime short skip conditions there will be hardly any interference to DX traffic on 14 Mc/s from European stations. At the present time it will only be occasionally possible to make contacts by the long path, though the situations will improve during November. Traffic with KH6 should be possible on 14 Mc/s on favourable days in the period from about 16.30 to shortly after 18.00. 7 Mc/s will be the main DX band in the two hours before midnight and in the latter half of the night. Basically contacts are possible on this band, as well as on 3.5 Mc/s, when the greater part of the transmission path lies in darkness, and this applies particularly to 3.5 Mc/s. The longer autumn nights and the seasonal decrease in the atmospheric noise level together with the relatively low solar activity are especially favourable to contacts on 3.5 Mc/s In the latter half of the night on 3.5 Mc/s the dead zone will frequently interrupt local traffic.

The provisional sunspot number for August was 8.6 with the periods of greatest activity lying between the 8th and the 12th, and the 27th and 31st of the month. The predicted smoothed sunspot numbers for December, January and February are 24, 26 and 28 respectively. These show a reduction from the numbers previously forecast showing that solar activity is not increasing as fast as originally anticipated.

QTH Corner

BY4SK	Via W4ECI, 3101 Fourth Avenue South, Birmingham, Alabama, 35233.
CR3GF	Via Radio Club Peruano, Box 538, Lima, Peru.
CR7BJ	Box 1, Milange, Mozambique.
EP21W	Box 78, Meshad, Iran.
F0BI/FC	Via ON4SZ, 88 Groenendaalse Steenweg, Hoeilaart, BT, Belgium.
FP8CA	Via K2OJD, 43 Oak Avenue, Irvington, New Jersey, USA.
FP8CP	Via K2KIB, 470 S. 17th Street, Newark, New Jersey, USA.
FY7YL	Box 267, Cayenne, French Guiana.
HC6GM	Box 374, Latacunga, Ecuador.
HC8FN	Via WA2WUV, Box 296, Massapequa, Long Island, New York.
JY74	Via Hammarlund.
KC6BY	Via W7DNU, 702 E. Pioneer Avenue, Puyallup, Wash. USA.
KG4AA	Via W4ORT, 1045 Le Brun Drive, Jacksonville, 5, Florida.
KG6IF	APO San Francisco, California 96315, USA.
WA7DYP/KH6	Box 36, FPO San Francisco, California 96640, USA.
WB6PZK/KJ6	Box 803, APO, San Francisco, California 96305, USA.
KM6CE	Box 23, FPO San Francisco, California 96640, USA.
WB6TFE/KS6	C/o ETV Pago Pago, American Samoa.
LU1ZC, LU4ZC	Via LU4AA, Carlos Calvo 1424, Beunos Aires, CF.
MP4DAN	Via DJ4AB, Hans A. Puffer, Aegidistr. 178-A, 425 Bottrop, Germany.
MP4TBO	Via VE1AKZ, Box 41, East Riverside, NB, Canada.
OA4MF	Via W2CTN, 156 Ketcham Avenue, Amityville, New York.
PX1UX	Via F9UX, Rue du Temple, Eymet, Dordogne.
PY2BZD/0	Box 19094, Sao Paulo, Brazil.
VE8CO	Via Hammarlund.
VP2GLE	Post Office, Grand Anse, Grenada, BWI.
VP2SJ	Via VE4OX, 647 Academy Road, Winnipeg 9.
VP3MU	Via W2FKQ, 17 Jarvis Street, Binghamton, New York.
VP5GC	Via K4RCS, 38 Butternut Drive, Greenville, SC, USA.
ZB2AM	Via W1HGT, 19 Woodstock Avenue, Brookline, Mass. USA.
ZB2AO	Flat 6, 36 Main Street, Gibraltar.
ZB2AP	Via W2CTN.
ZS2MI	Via ZS1CZ, Land Survey, Office, City Engineers Dept., City Hall, Cape Town, CP, South Africa.
4X9HQ	Via Hammarlund.
7X2AH	Via WA4STL, 3326 Sargeant Drive, Charlotte 8, NC, USA.
7Z3AB	Box 2486, Dharhan, Saudi Arabia.
9F3USA	Via W7TDK, RFD1, Box 374, Forest Grove, Oregon, USA.
9M4JW	23 Ripley Crescent, Singapore, 19, Singapore.
9Q5GG	Box 377, Mbujimayi, South Kasai, Congo.
9U5IB	Via W8WC, 359 Bonham Road, Cincinnati 15, Ohio, USA.

* * *

RSGB QSL Bureau: G2MI, Bromley, Kent.

(14.47), 9N1MM (15.18), 9Q5AA (20.44), 9X5CE (16.33).

21 Mc/s C.W.: FG7XJ (21.00), FL8RA (10.30), CR6HH (19.25), JA3CZH (12.22), VQ9J (09.32), 4S7DA (15.28), 6W8DD (18.45), 7G1A (18.32), 9M2OV (10.00), 9M4MX (09.50).

21 Mc/s A.M.: HC2SW (21.40), HP1FR (21.30), JA3CWX (12.25), JA5BDZ (12.05), JA0ARL (11.20), OD5's (07.50-19.25), PJ2CT (20.32), PX1UX (17.45), PY9HL (22.03), VK6QL (08.10), VP2GX (22.05), VP2SY (20.30), VP4RS (20.20), VP6AQ, BW, LJ (21.38-22.30), ZP3AB (20.50), 9Q5PZ (20.30).

21 Mc/s S.S.B.: CE3RC (19.35), CE8CM (18.26), CR5SP (20.55), CR6DX (17.40), EL8AF (17.43), MP4TBO (09.25), OA3P/8 (22.25), PY2BZD/0 (18.30), PZ1CN (15.59), UF6UB (18.20), VK2NN (07.46), VK4DD (09.22), VK9PL (Papua 11.16), VS6AJ (07.45), YA4A (08.06), YN1MAN (16.17), ZD5D (17.32), ZD8JC (18.13), ZS2MI (14.00), 3A2CP (13.20), 4W2AA (09.55), 4X1DK (09.50), 5H3JR (17.40), 6O6BW (19.30), 9L1JW (19.42), 9M2OV (09.23), 9M4LP (09.40). From the above one would assume that s.s.b. is at last getting a bigger following on 15m, or perhaps the a.m. boys are not being so active?

28 Mc/s C.W. and A.M.: 9J2GJ (11.30-12.00).

DXpedition News

The reported DXpedition by **FR7ZI** did not materialize during September, though a letter recently received by the writer from FR7ZI assures that it will take place. Further information if available, will be given in DX Briefs.

G2HFD's fourth annual Island sortie this year took him to Alderney as **GC2HFD/A** from July 24 until August 14. Nearly 1000 QSOs were made in 75 countries on 21, 14, 7 and 3·5 Mc/s s.s.b. and c.w. using a KW2000 with a home brew linear into a 41 ft. vertical. Good DX contacts were made with HK0QA, HS1S, ZD5, ZD8, 9M4, etc. All contacts will be QSL'd on receipt of incoming QSLs either direct or via the bureau.

The **YASME** foundation has been re-activated and initial plans are that W6KG and his XYL KL7DTB/6 are going to operate from most of the rare and semi rare countries of the world. Written application has been made to operate from approximately 150 countries and the first call heard here asking for QSLs via YASME was **KG6SZ** operating on 14 Mc/s c.w. on September 12 to September 19. Frequencies to be used for all YASME DXpeditions will be the same as those being used by the present W9WNV and K7LMU DXpedition. All QSLs to: YASME Foundation, Box 2025, Castro Valley, California.

The future movements of Gus, **W4BPD**, are clouded in mystery. It is rumoured that after his JY74 operation from Jordan (who dreams up these prefixes?) he would try for licences for YI and YK before putting an all time new European country on the air. Possibly the best advice is to keep an eye on his favourite frequencies of 14,035, 65 and 7003 kc/s c.w. and 14,110, 140 kc/s s.s.b.

DJ2KS/PY0 operated for about an hour on August 29 from Saint Peter and Paul Rocks, making about 30 QSOs in all and it is reported that he will revisit these Rocks on his return trip from the South Atlantic. At present there is doubt as to whether he had a legitimate licence to operate from here but if he did it is almost certain that it would count as a new DXCC country.

Rumour Corner. The following are rumoured as being active in the near future: Navassa Island, KC4AF by W2NSD/1 October 20-October 26, WA6IQ from 3A0, DJ2KS from Fernado de Noronha around October 14, VQ9HB from Agalega Island, 5U7AU from XT2.

Jose, **CR7GF**, will use a TR3, RV3 and dipole for his trip

UR2AR, Enn Lohk, one of the leading s.s.b. stations in the USSR uses a three element quad with the home built equipment shown here.

to Portuguese Guinea which will begin on September 28 and last until October 14. Transmitting frequency will be 14,120, listening 5 up or down and 14,220/240 kc/s. The address for all QSLs will be found under *QTH Corner*.

Further to last month's notes on **W9WNV,** Don obligingly put **8F3** and **BY** on the DX map even though the latter was difficult to work from Europe. After closing down from 8F3 on September 19 Don was due to put XZ2TZ on the air while Chuck, K7LMU, proceeded to Thailand. The future movements of these two operators after the **XZ** and HS stops are obscure and it is believed that transport to some of the rarer Islands is providing a major problem to this DXpedition. Further information, if received in time, will be found under DX Briefs and watch should be kept on the following frequencies: **C.W.: 7005/010, 14,045/55, 21,045/55 kc/s. S.S.B.: 7070/100, 14,100/110, 21,400/410 kc/s.**

Contest News

The **Sixth Annual *CQ* 160m C.W. Contest** was again a resounding success with a record 270 logs from 26 countries received. It was a pity that conditions did not match the activity, but nevertheless good DX contacts were made. The top ten were:

GM3IGW/A	**32,950**	W9YYG	26,568
W3GQF	30,564	W2UWD	26,500
G3GRL	**30,535**	W0VXO	26,316
W2EQS	27,552	DL1FF	26,160
K2DGT	27,440	W8FGX	26,028

Congratulations to G3IGW on his fine achievement.

The results of the 1964 *SAC Contest* shows that **G3PSY, GI3OTV, GM3JDR** and **GW3MRI** were successful winners on c.w. whilst **G3NFV, GM3JDR** and **GW3OCD** took UK phone honours.

The complete rules of this year's *CQ World Wide DX Contests* will be found on page 690.

Finally a reminder that the *RSGB 7 Mc/s Phone Contest* takes place on October 16 and 17. Complete rules will be found on page 474, July BULLETIN.

Awards

The YO DX Club offers an award for contacting five of their members on any band using any mode. A certified check list together with five IRCs should be sent to: The YO DX Club, Box 95, Bucharest, Rumania.

A reminder that G2BVN will check lists for the *CQ Magazine's* s.s.b. awards. Steve has s.s.b. and WPX application forms available to those who require them on receipt of an s.a.e.

The San Fernando Valley Radio Club will be operating W6SD/6 from 16.00, November 13 to 20.00, November 14 on the following frequencies: 21,425, 21,050, 14,270, 14,050 and 7050 kc/s. Besides confirming all contacts made, certificates will be given to the DX station sending the most colourful QSL and to the DX station covering the most miles per watt.

The Ockenden Venture Award is available to any amateur in the world for hearing or contacting five members after January 1, 1961. The award is issued on any mode and log extracts certified by two other amateurs must be submitted together with a minimum donation of 7s. or its equivalent. The money received, less expenses, all goes to the Ockenden Venture to aid refugee children in England. The issue of the award automatically confers honorary membership and a list of members may be obtained by sending an s.a.e. to: The Awards Manager, G3IFB, 49 Dovers Park, Bathford, Bath, Somerset.

FR7ZI sends details of the **DTR Award,** sponsored by the REF in connection with the Tricentury of the Island of Reunion. Applicants must contact any two different FR7 stations between October 1 and October 30 on any mode. Applications should be sent to FR7ZD, Ligne des 600, Tampon, Reunion Island, together with 10 IRCs.

The **7HK7 Award** is available to any amateur who has contacted seven HK7 stations on phone or seven on c.w. after January 1, 1962. Applications must be accompanied by your own QSL cards for each of the seven HK7 stations worked, and sent to: Box 222, Bucaramanga, Colombia.

The San Antonio Radio Club offers a certificate for contacting or hearing five stations in San Antonio of which two must be members of the Radio Club. Though QSLs are not required, stations contacted must have received the applicant's QSL. Send a GCR List and log data to San Antonio Radio Club, 100N Winston Lane, San Antonio 13, Texas. There is no charge for this award.

AWARDS

Information on current certificates and awards will be found in the *Directory of Certificates and Awards* which deals with between 600 and 700 awards, both for the transmitting amateur and the s.w.l. This volume is produced in loose leaf form, suitable for a three ring binder, by C. Evans, K6BX, and publication is quarterly from January 1 in each year. Each issue is self contained and amendments are not issued. Stocks of this book are not held to ensure that only current volumes are distributed, but orders for direct delivery from K6BX may be placed with **G2BVN**. The non-profit cost per issue is 18s. 6d. post paid, with a binder costing a further 7s. 6d. if required.

Commonwealth Call Areas Table

	1·8	3·5	7	14	21	28 Mc/s	Total
G3KSH	—	26	24	81	26	—	157
5N2AAF	—	6	14	65	43	16	144
G3DYY	—	9	31	55	19	7	121
G8JM	4	—	—	80	19	1	104
VO1FB	12	17	14	45	13	1	102
G3LHJ	4	5	9	32	34	7	92
G3AAE	—	—	7	57	26	1	91
A4038	3	8	8	69	34	16	138
A3633	6	9	17	68	29	8	137
A2498	2	8	10	76	29	7	132
A4431	3	8	6	53	38	5	113
A4452	—	2	—	44	58	8	112
A4311	1	10	2	72	20	6	111
A2340	6	13	22	51	18	1	111
A3942	5	16	33	42	8	—	104
A3699	5	11	14	42	26	5	103
A4048	5	13	6	58	17	2	101
A3902	4	14	5	43	22	8	96
A4431	3	8	4	41	34	1	91
A4391	4	6	2	32	20	4	68

DX Briefs

WA7DYP/KH6, Kure Island, is active most weekends around 14,265/290 kc/s s.s.b. between 07.00 and 09.00. Chuck will be there for three months after which amateur activity from Kure Island will cease, for the time being.

FM7WQ skeds his QSL manager, W4OPM, on Tuesdays or Wednesdays at 17.15 and 20.00 on 14,125 kc/s, listening 14,260 kc/s. Anyone wishing to contact FM7WQ should do so five minutes before the sked is due to commence.

KG6IF is now active once again from Marcus Island most mornings around 09.00.

TL8SW is expected to be signing with a TT8 call in the near future after his return from the States.

EP2IW intends to be active on Top Band during November and December and will be pleased to make skeds. The address will be found under *QTH Corner*.

ZD8AR will be active during both sections of *CQ* contest and hopes to have a 7 Mc/s quad up in the near future. QSL's via Hammarlund. *(Continued on page 693)*

The I1HC 16-Element Stacked Array For 144 Mc/s

BY G. C. FOX, A.M.I.E.E., G3AEX*

THE purpose of this review is to describe the features and performance of a 16-element stacked array for 2m, manufactured by A. Marincola, I1HC in Italy. Acknowledgment is made to R. F. Stevens, G2BVN for his assistance in providing the aerial for test.

Electrically the aerial consists of four pairs of horizontal collinear dipoles arranged vertically in four bays at one half wavelength spacing backed up by four pairs of collinear reflectors, spaced approximately one eighth wavelength behind the dipoles. Fig. 1 illustrates the general arrangement. The dimensions of the elements and their spacing are such that when the collinear dipoles are fed in parallel by means of open wire transposed phasing lines, the feed point impedance of the whole array is nominally 300 ohms. An impedance transforming balun is therefore required to match the aerial to 75 ohm coaxial feeder, as is recommended by the manufacturer.

As despatched from the factory, the aerial is broken down into its component parts for packing and transportation, and is supplied with the necessary hardware for mounting the assembled array on a mast whose diameter does not exceed 1⅝ in., which precludes the use of standard scaffold poles for this purpose. A very adequate set of instructions and an assembly drawing are provided. The instructions are in Italian, but no difficulty should be experienced in assembling the aerial from the drawing alone, providing that it is remembered that the reflectors are longer than the radiators and cannot be interchanged. Another point worth noting is that the screws and nuts provided have metric threads, and difficulty may be experienced in obtaining them locally should any be lost or damaged.

Excellent use is made of plastic mouldings for the insulators and transposition blocks, the latter being moulded integral with the tubing comprising the phasing lines. Red and black plastic caps are provided to fit the open ends of the elements to prevent ingress of water and reduce acoustic noise. The colours serve to identify radiators and reflectors respectively. All metal parts except the mast mounting brackets and nuts and bolts are made in lightweight alloy, the whole aerial weighing a little less than nine pounds. It has proved to be quite rigid and has withstood the strong winds experienced in the London area during the past few months.

Tests on the aerial were conducted at the writer's home in Bromley, Kent, which is representative of the average suburban location. A 32 ft. rotatable mast was used to mount the aerial, which occupied about 10 ft. of mast length at a mean height of 27 ft. above ground level. The mast was sited at the rear of and adjacent to the house, with a bearing at the 17 ft. level, attached to the soffit boards. A 75 ohm coaxial feeder was employed and a suitable balun made up in accordance with the instructions provided.

A receiver equipped with a signal level meter was used for the majority of measurements taken, and was tuned to the RSGB v.h.f. beacon transmitter at Wrotham operating on 144·5 Mc/s. The level of the incoming signal at the receiver was checked by means of a signal generator after each measurement. By rotating the aerial to known bearings and taking measurements of the level of signal received from Wrotham, data was obtained from which a horizontal polar diagram could be plotted. This showed the expected figure of eight pattern, with the minor lobe to the rear. The minima off the ends of the aerial were unequal, which is attributed to an unbalance in the aerial system. Attempts were made to equalise the depth of the minima by the use of alternative balun transformers but no appreciable improvement could be obtained. The front-to-back ratio was measured and found to be 16db. The horizontal beam width at the 3db points was found to be 40° approximately. It was unfortunately not possible to determine the gain of the array relative to a half wave dipole, which is quoted by the manufacturer as 16db, due to the limitations of the test site. Finally the array was energised from a 10 watt transmitter and the s.w.r. on the feeder determined by means of a reflectometer. The s.w.r. was found to be 1·75:1 at two frequencies near the centre of the 2m band. It did not vary with the rotation of the aerial and from this it appears that the impedance of the array was not appreciably affected as the aerial was rotated by the presence of the roof and a chimney stack at a distance which varied between 1 and 1½ wavelengths. The front-to-back ratio and horizontal beamwidth are quoted by the manufacturer as greater than 30db and 15° respectively, but the writer was unable to confirm these figures by measurements under the conditions quoted.

When used with the station transmitter and receiver the aerial performed very satisfactorily giving signal strengths on received signals some 4–6db above those provided by a 4-over-4 slot fed array in the roof space. Similar reports were obtained on transmitted signals.

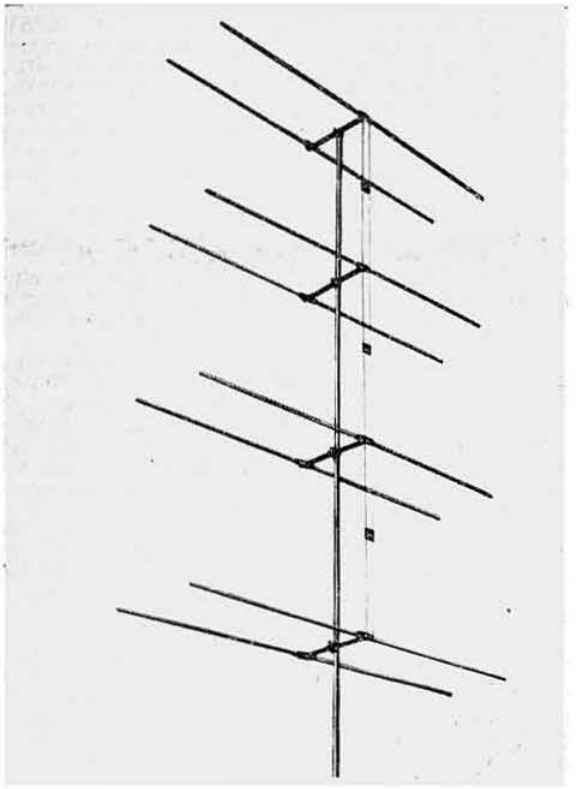
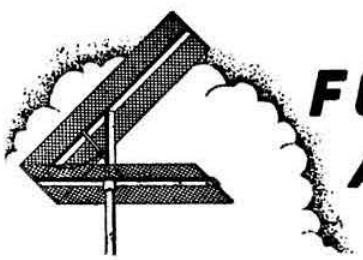
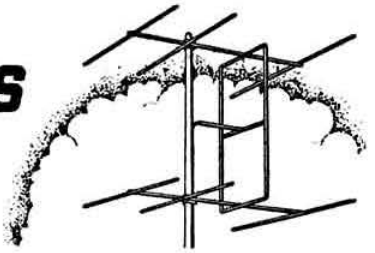


Fig. 1. General arrangement of the I1HC 16-element stack. A co-axial balun and 75 ohm feeder are attached at the bottom.

* Member, Technical Committee



FOUR METRES AND DOWN



By F. G. LAMBETH, G2AIW*

A VERY interesting and successful experiment took place on August 22, when PA0IF and PA0LJ (Utrecht), with the collaboration of DJ4ZC, sent up a balloon carrying 2m translator apparatus.

This balloon was estimated to reach a height of 30 kilometres in about 1½ hours, and then parachute to earth in about half an hour. The receiver operated on 144·1 Mc/s ± 20 kc/s and signals were re-transmitted on 145·9 Mc/s ± 20 kc/s with a power of 300 mW. There was also a 150 mW beacon transmitter on 145·95 Mc/s keyed 9/10ths of a second on, and 1/10th off.

The 2m band was immediately turned into a happy operating turmoil. The equipment indeed functioned for approximately 1½ hours, and during that time many QSOs and hearings have been reported, including G stations and continentals at least down to the Swiss border. **G3LTF** (Galleywood) worked DJ3ENA, DJ7HY both on s.s.b., two PA stations, ON4FG, G3CCH and G6AG, whilst **G3MED** (Banstead) also worked DJ3ENA and DJ7HY. **G2XV** (Cambridge) had a good try and although he did not get any QSOs, was able to hear G2JF, G3BA, G3CCH, G3EMU, G3AHB, G3LTF, G5YV, G6AG, DL1OX, PA0DX/A, PA0IO/A, PA0FAS, PA0LH and ON4FG. G2XV thinks it is rather a pity that more stations did not use their keys, as some of the rather excessive QRM was caused by s.s.b. However, as some of the stations turned to the key, it seems that they may have thought the same thing!

G3CCH (Scunthorpe) found the whole experience very interesting, but like most of the other operators, he did not hear anything other than G, DL and PA. The QRM was rather like the l.f. end of 20m during a contest, but with someone switching the receiver on and off! It was rather a pity that the a.g.c. had to work so well, but some of the signals received must have been really overpowering.

G3CCH worked G3LTF and PA0LB, and heard DL1OX, DL3SP, G2JF, G3BA, G3EMU, G3MED, G5YV, G6CW, PA0IJ, PA0LH, PA0SB and PA0LMQ. G3MED (Banstead) was called on August 13 by PA0IF (s.s.b.-145·1 Mc/s) who told him about the balloon translator. G3MED worked the PA station a number of times before the balloon went up to get information for publicity purposes. The translator was first heard at 06.10 when it was about S6 with a number of PA A3 stations. A CQ call brought in PA0IF who was RS 5-6 (s.s.b.). The A3 stations appeared to give up after about 10 minutes, probably owing to QRM. A large number of s.s.b. stations were heard with signals S9 or better. Between 06.10 and 07.14 the stations worked were: DJ4ZC, DL1OX, DJ7HY, DJ3ENA and PA0IF all s.s.b. between S6 and S9. Some c.w. stations were heard but as there were so many s.s.b. stations to listen to G3MED only noticed G3LTF RST 579. The signals disappeared abruptly at 07.16, when the balloon presumably burst. The countries heard were G, ON, PA and DL. There may have been others, but the QRM made only the fairly strong signals Q5.

From VERON *Newsletter* we understand that the stations heard via balloon were the following: PA0LB, 0FAS, 0LH, 0CRA, 0IJ/a, 0BN, 0HRD, 0PMQ, 0UNT, 0DGH, 0FB, 0JYL, 0WCH, 0BRX, 0BI, 0EPS, 0BU, 0RLS, G3RXF, G3LBE, G3MED, G3LTF, G6AG, G2JF, G3EMU, G3DIV, G3CCH, G3BA, G5YV, G3AHB, ON4FG, ON4LF, DJ7OX, 9XH, DL1OX, DJ7HY, DL9EO, DL3YBA, DL3ENA, DM4ZID, DL9GU, DJ4ZC, DL1SN. Moreover stations not completely identified included LX, OE and F.

PA0LB (Hulst) worked PAs, DLs, and G2JF, G5YV, G3BA, G3AHB and G3CCH.

PA0FAS (Amersfoot) worked DL, ON, and G6AG and heard G2JF, G3LTF, G5YV, G3AHB, G3BA, G3LCH.

PA0BN (Osterbeck) heard all the Gs above with G3EMU and G3DIV.

ON4LF heard HB9RG and 30 or 40 others, and worked PA0IJ/A (s.s.b.) and PA0UNT ('phone), **ON4FG** worked PAs, and also G3LTF, G2JF, G5YV and G6AG.

ON5DK had similar results.

LX1SI, among others, worked G3MED.

This information came via G2JF from NL314 who plays a major role in the production of the *VERON V.H.F. Bulletin.*

The next balloon, it is hoped, will have been launched on September 25.

North West V.H.F. Convention

The North West V.H.F. Group's fourth convention in Manchester on September 18 was highly successful with an attendance of 100 from G, GI, GM, GW, GC and EI. Lectures and visits provided a most interesting and entertaining afternoon, to culminate in the dinner in the evening. Mr. Austin Forsyth, G6FO (Editor of *Short Wave Magazine*) ably took the Chair, and introduced the main speaker, R. C. Hills, G3HRH, the Society's V.H.F. Manager.

Four Metres and Down Certificates

The Council has accepted a recommendation from the V.H.F. Committee to introduce two new classes for the Four Metres and Down Certificates covering the 1296 Mc/s band. Two certificates will be available for listening and transmitting respectively, and the qualification for each will be proof of contact (or confirmed listener reports) with stations in 3 countries and also in 20 counties of the UK. Otherwise the general rules for the Certificates will apply, which are as follows.

	Qualifications	
Four Metre Award Four Metre Listener Award	20 Counties	3 Countries
Two Metre Award Two Metre Listener Award	30 Counties	5 Countries
Two Metre Senior Award Two Metre Senior Listener Award	60 Counties	15 Countries
Seventy Centimetre Award Seventy Centimetre Listener Award	20 Counties	3 Countries

* 21 Bridge Way, Whitton, Twickenham, Middlesex. Please send all reports for the December issue by November 5.

The rules governing the award of the certificates are as follows:

(i) All claims must be fully supported by QSL cards.
(ii) All contacts must have been made on or after January 1, 1961.
(iii) Eligible counties are those of the United Kingdom of Great Britain and Northern Ireland, listed on the claim form available from Headquarters on request.
(iv) Stations are eligible for certificates in the following groups:
  (a) Fixed stations
  (b) Alternative address stations (—/A any address)
  (c) Portable stations (—/P any location)
  (d) Mobile stations (—/M any location)
  Categories cannot be mixed.
(v) All claims must be submitted to the V.H.F. Committee at RSGB Headquarters, 28 Little Russell Street, London, W.C.1.
(vi) All claims must be accompanied by a check list.
(vii) All cards will be returned by recorded delivery service and return envelopes are not required.

All applicants for these awards are reminded that a duplicated check-list together with a copy of the rules, is available upon request from Society Headquarters. Use of this list makes the recording of a claim and the subsequent checking easier and reduces the chance of a delay resulting from an inaccurate claim.

Two Metre News

G3EMU (Canterbury), and XYL, recently paid a visit to PA0EO, with whom he has kept a daily sked for a couple of years. Met by PA0EO and PA0AKA/M, he was immediately presented with an official permit to operate the Dutch station. There were a number of locals standing by to give a rousing radio welcome on 2m, and several personal QSOs were made to meet the " face behind the voice " of old 2m QSO partners. G3EMU asks us to tender on his behalf thanks and appreciation for the way in which all concerned made their stay so enjoyable.

Any success which may have been enjoyed by **GM3RUF/P** during their DXpedition will owe a great deal to the efficient sked arrangements made by G3BA. Any expedition having G3BA for a " business manager " is well away before it starts.

G3DIV (Polegate) found the month rather featureless, although there were fair conditions on several evenings. The best QSO was with HB9ADT and at the end of the period GB2GC was worked in a very bad direction, with the G3DIV aerial pointed straight at the South Downs.

OK1DE reports that the QSO between OK1KDX/P and GC2FZC during the sporadic *E* opening is the Czech National Record breaking QSO and the first GC/OK QSO on 2m. Apparently the directions of propagation as noted from Czechoslovakia were (1) from the British Isles to S.E. Europe, and (2) from Italy/Southern France northwards as far as Berlin and Scandinavia. There were apparently large " blank " areas in between. A letter from YO8HL to G3DIV regarding his record breaking QSOs points out that this opening was the first one in which he had been able to work well away from neighbouring countries. Their site was 2,200m a.s.l. and about 10 km NNW of Sinaia, 130 km North of Bucharest. They had only hoped to work into OE or YU and were engaged in the Czechoslovak " Polni den " contest at the time. Their surprise at the arrival of the sudden sporadic *E* G stations can be imagined.

The V.H.F. Field Day in conjunction with the IARU Region I V.H.F. open contest (September 4-5) did not appear to be as lively in respect of DX contacts as might have been hoped. Some stations (e.g. G3FRV) were approaching the 150 QSO mark towards the end of proceedings, but although continental stations were being called from time to time, it is thought that only the better sited stations would have much luck with them. There was a brief peaking late on the Saturday and early on the Sunday, but conditions generally could only have been characterized as poorish! For the average participant, stations could have been worked up to 200 miles but it was not all that easy.

TWO METRE BAND PLAN

Recent correspondence received by the V.H.F. Committee and the V.H.F. Contests Committee has shown that feeling is running high among users of the 144-146 Mc/s band on the subject of adherence to the voluntary bandplan. Many stations who do support and abide by it are incensed by the way in which others constantly resort to out-of-zone operation, particularly during contests and E-DX openings. It has been suggested by many that operation within the bandplan should be mandatory in all RSGB 144 Mc/s contests and persistent offenders disqualified. It has also been suggested that zone-jumping is unethical, selfish and not in the true spirit of amateur radio. The fact that such comments come in to the Society indicates that there must now exist a considerable divergence of opinion as to the necessity for a bandplan with modern operating techniques and equipment. The V.H.F. Committee would like to have views from users of the band as to the desirability or otherwise of persevering with the present plan, and all comments will be very welcome, sent to Society Headquarters for the attention of the V.H.F. Committee.

G3OCB (nr. Truro) found conditions poor and activity low with a slight improvement for a couple of hours on August 14, when G2BAT, G2AXI, G3KEQ, G3LBA, G3MED, G2DQ and G3OBD were worked. Other stations worked include GW5BI, GW3FSP, GW3MFY, GB2GC and the usual locals. The 2m aerial is now a 24 ft. Yagi at 45 feet. Skeds between G3OCB and GM3RUF/P were not successful, as G3OCB could not receive the Scottish station. G3XC was successful on the very last evening of the skeds and had three contacts with them. G3AET also heard them but could not establish contact probably owing to his lower power. GM3RUF/P reported to G3XC that G3OCB had been heard 539. Stations were set up for 2m and 4m and 70cm during Field Day, but owing to the weather they packed up in disgust after working only a dozen or so stations.

G3XC (Indian Queens), on the same subject, wants to know why it always rains and gale force winds prevail at Field Day time. Five stalwarts attempted to take part after spending 1½ hours in the garage while the rains came. They did manage to get to the site and to have one station on the air by 20.15 however, but by 10.00 on Sunday it was still howling and pouring and they decided to call it a day. Having received a telegram from GM3RUF/P to say that G3XC had been heard in the mornings at RST 569, several receiver checks were made, but nothing was found to be amiss. G3XC waited until 20.00 and then finally made contact at 20.00, 21.00 and also 07.50 next day. During the morning QSO the signal was a weak RST 339. A request from EI6AS for a sked led to a first time QSO at 07.15, his signals being RST 339, but at 20.00 the next evening he was RST 559. Skeds with G3DY and G2CDX have so far no results to show. A new receiver has just been completed at G3XC which should help to dig out some of the weaker signals. Other local activity: G3LPB, G2BHW, G3AET, G3NVJ and G3IGV can all be heard from time to time and there appears to be a lot of construction going on in Cornwall.

G3SLI-EI5AW/M-ZB2AP went west in Ireland on July 7 as EI5AW/M and worked from counties Leitrim, Sligo, Roscommon and Mayo. EI2W was worked from each of these, and thereby gained his 100th county. EI6AS was also

worked from all four. The weather was very bad and the only other station heard was GI5AJ who was in QSO. The GI3SLI operation commenced in September 1964 and ended in July 1965, the total of counties worked being 33, countries 6. Now established on Gibraltar as ZB2AP, operation will commence as soon as the aerial arrives from J-Beams, and this will be set up on the top of the Rock at 1,400 ft. a.s.l. The possibility of DX QSOs from the position and warmer climate will not be lost sight of. Times and frequencies will be announced over 14 and 21 Mc/s. Skeds can be arranged via ZB2A (QTHR).

G2JF (Wye) writes that high scorers in the **144 Mc/s Contest (Portable)** are claiming scores as follows: G3UHF/P 10,576 points, G3NVJ/P 14,422 points, G3MDH/P 11,173 points, GW3BA/P 16,148 points, G3XC/P 13,842 points and GW3OXD/P 11,697 points.

Since our last notes in the BULLETIN, very little of consequence has occurred in the tropospheric propagation field, the best days noted probably being August 14, 15, 16, 17.

The V.H.F./NFD Contest which ran concurrently with the Region I V.H.F. Contest was not blessed with good conditions, in fact propagation was below normal. The stations with good locations probably did quite well. G3BW/P (YO28C) had a good signal in the south-east of the United Kingdom, G6XA/P (Honiton), GW3CBY (Swansea), G3JRL/P (Sheffield ZN53D), G3NLY/P (Near Stafford) and G3ENY/P (Bridgnorth, YM38E) were also fine signals.

OK1DE found adverse conditions for the September contest. He scored 29,065 points, which he finds poorish, and says that the stations simply were not there. The best DX was SM7BZX followed by HG2RD. The other DX contacts in the 500/400 and 400/300 km range compare unfavourably with the previous years. The rhombic aerial did help but had drawbacks as it was not rotatable.

Four Metres

G3JMY (Bristol) recently had a holiday with a B44 Mk II which was operated portable from various sites in Sussex and Pembrokeshire. A week in Sussex brought QSOs with G3KAR, G3JLO, G3HYG, G3PQJ, G2DYH, G3OQC/M, G2QK, G3TLA/P, G3RCN, G3PUR, G3SFE, and G3TRY. G3TRY in Bucks was worked 5 and 7 over the South Downs. The trip to Sandersfoot (Pembs) was interesting because a sked, made whilst in Sussex, was kept to the minute over a 120 mile path including two mountain ranges 2500 ft. high, although the two sites were only a few hundred feet a.s.l. The contacts were RS 5-8 both ways between GW3JMY/P and G3KAR/P (Nr. Evesham). Other stations worked from various points around Sandersfoot were G3EHY (95 miles), G3PPG (117 miles), GW3JKA/P (25 miles). No fixed Welsh stations were heard or worked even during non-TV periods.

G3FNM/M in Bideford was heard calling CQ at RS 5-8 but was not worked. The r.f. output of the rig was 6 watts and the aerial system was a 3 element Yagi 15 ft. above ground. The B44 made the evening hours in camp worthwhile.

Seventy Centimetres

G2XV (Cambridge) made contact with GB2GC during their expedition, bringing his county total to 43, with 11 countries involved. Jerry still needs Cornwall, Cumberland and Westmorland to complete the English County list, and asks if anyone in those counties will offer him skeds in an effort to do this.

G5ZT (Plymouth) has two firsts to report: Now as G6ABC/T portable, situated on Kit Hill, Cornwall he worked two way phone and video with G3ARE (G6ARE/T) situated at Plympton, nr. Plymouth. This took place on August 7 at 17.00 GMT with the QSO lasting two hours. G6ABC/T/P had 20 watts into a QQV06/40A p.a., 405 lines standard, a 14 element Yagi and a transistorized converter into TV receiver. G6ARE/T had 100 watts into a 4X150A p.a. 405 lines standard, Plessey valve type converter in TV receiver and 8-over-8 slot aerial. G5ZT/P (10 miles east of Plymouth, 800 ft. a.s.l.), worked the first 70cm Alderney to G with GB2GC—reports GB2GC RST 5-8/4-9 Phone RS 5-8/3. G5ZT/P c.w. RST 5-7-9 phone RS 5-7/9. The G5ZT rig was the television transmitter keyed and anode/screen modulated. This equipment being set for three functions, video, c.w. and phone. Later, at 18.30 GMT another QSO was worked S9 phone both ways. At 1900 GC2FZC was worked at good strength both ways. G6ARE/T and G6ABC/T are both available for portable tests and both intend to go either 5 miles S of Okehampton at 1850 ft. a.s.l. or to Hay Tor (1200 ft. a.s.l.) to endeavour to obtain DX TV QSOs and would appreciate any schedules with S. Wales, Bristol, London, and Bournemouth. The areas mentioned should be good from those sites.

G3OCB (Nr. Truro) with a new aerial (6-over-6) at 50 ft. worked GB2GC for his first 70cm QSO at RST 5-5-9 in RST 5-6-9 out although the take off is not ideal. G5ZT has also been worked RS 5-9 (each way) on phone, from Rame Head (approximately 40 miles).

G8AGO (St. Albans) is operating on 432.900 Mc/s and believes the idea of a frequency list is a very good one. Please let us have your frequency information.

Meteor Scatter

G3LTF worked YU1EXY during the Perseids. (Mid-August). We notice a certain trend to claim m.s. QSOs when the correspondence starts on one day and finishes on the day following, but without continuous operation. One case we heard of started one evening and finished the next. This does not really appear to be a QSO. After all, if the first effort was incomplete, one would expect another try to be made later, but this try could not complete the QSO. It would be only a fresh start! Comments are invited.

OK1DE reports that OK2WCG worked SV1AB during the Perseids for the first OK/SV QSO. OK1VHF and OK1-AJD/P have both had successes with F8DO, UA1DZ and UA1MC, thus augmenting their countries list. OK2WCG had a sked with EA4AO, but the QSO was not completed.

A tailpiece from OK1DE tells us that OK2WCG *did* make it with EA4AO on Meteor Scatter as well as with SV1AB reported above, both being at about 1910 km distance.

Moonbounce

The QSOs worked by KP4BPZ on July 24 were as follows: W1BU, W1HIV, W1OOP, W1TQZ, K2CBA, K2MWA/2, W2CCY, W7PUA/2, W2AOP, W3SDZ, K3HOC, WA4CYR W4HHK, W5LUU, K6MIQ, WA6LET, WB6FSC, W6YK, K6TSK, K6RIL, W6DQJ, K6JLZ, W7JRG, W7UAB, W7UDM, K7ZIR, K7MMT, W8TYY, W9GAB, W9HGE, K0DOK, DL9AR, DJ4AU, DJ0LO, DL3YBA, DL1EI,

(Continued on page 693)

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

Call-sign	Location	Nominal Frequency	Emission	Aerial Direction
GB3CTC	Redruth, Cornwall	144·10 Mc/s	A1	North-East
GB3VHF	Wrotham, Kent	144·50 Mc/s	A1	North-West
GB3LER	Lerwick	145·996 Mc/s	A1	S
GB3LER	Lerwick	70·305 Mc/s	A1	N/S
GB3LER	Lerwick	29·005 Mc/s	A1	N/S

RSGB V.H.F. BEACON STATION GB3VHF

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

Date	Time	Error
August 24	15.00 GMT	20 c/s low
August 31	08.30 GMT	26 c/s high
September 7	09.59 GMT	20 c/s high

RSGB International Radio Communications Exhibition

October 27–30

Radio Communications Exhibition Station

The Society's headquarters station GB3RS and GB2VHF will again be in operation from the Exhibition.

GB3RS will be operating on the 160, 80 and 20m bands during Exhibition opening hours, using c.w., a.m., and s.s.b. modes of emission. In line with experience gained in previous years, it has been decided not to operate on any fixed schedule owing to the difficulty of forecasting activity and conditions.

Generally, c.w. transmission will be on 160m during evening periods, and a.m./s.s.b. will be used at other times. The a.m. transmissions will be in the A3H (compatible a.m., one sideband and carrier) mode, as for last year.

Subject to equipment availablity and activity GB3RS will be pleased to make RTTY schedules, and stations wishing to make arrangements should call the Exhibition station on telephony service. RTTY transmissions will use 850 c/s shift at a speed of 50 bauds. GB3RS will also arrange 2m or 4m schedules with GB2VHF upon request.

Note that the station will *not* answer " breakers," nor take part in multi-way or net QSOs.

GB2VHF will operate on the 2m or 4m bands, depending upon activity, using the A3 mode. Provision is being made for both vertical and horizontal polarization in the 4m band. The exhibition operators would like to explain, in advance, that the extremely high noise level at the Exhibition makes the weaker signals difficult to read: don't blame the operator, he's doing his best!

GB2VHF will also be pleased to make RTTY schedules, subject to equipment availablity; and transmissions will be on a.f.s.k./850 c/s shift at a speed of 50 bauds.

QSL Cards

A special QSL card will automatically be despatched **via the RSGB QSL Bureau** for each contact with either station. Alternatively, visitors to the Exhibition may claim their QSLs at the Headquarters station stand. Your own QSL should be sent via the Bureau clearly marked GB2VHF/GB3RS via G3FRV.

Visiting Mobiles are kindly asked not to operate for lengthy periods in the vicinity of the Exhibition. Several cases of severe interference to GB3RS/GB2VHF occurred last year for this reason. Remember that other stations may be calling the Exhibition, and the operators find it most exasperating to have to sort out weak stations from underneath S9+ mobiles working each other from car park to car park!

GPO at the Exhibition

As in previous years, the GPO will be well represented at the exhibition this October, and will be presenting a demonstration of microwave links as the main feature. Relating to this, models of both the Goonhilly dish aerial and the Post Office Tower in London will be on show. Frequency control equipment will also be put on display, and this will include a " buried ", synthesized 100 kc/s crystal oscillator. Information on s.s.b. power measurement will be available in the light of the recent revisions to the recommended procedures and the sound licence, and other enquiries on GPO services for the amateur can, of course, be presented at the enquiry counter.

Home Constructed Equipment

This year the home constructed equipment will form a special feature on the stage of the Seymour Hall. To improve the attraction of the display, the equipment will be divided in to 14 classes and each class will have a special award of its own. There will be no limit on the number of entries and all members are asked to submit entries in as many classes as possible. If desired the choice of class may be left to the exhibition committee.

The classes are:

1. H.F. Transmitters
2. Receivers
3. Receiver Attachments and Converters
4. S.S.B. Transmitters
5. V.H.F. Equipment
6. U.H.F. Equipment
7. Mobile Equipment
8. Transistor Equipment
9. Miniature Equipment
10. Test Gear and Tuning Units
11. Low-cost Equipment
12. Cabinet Work
13. Power Supplies
14. Audio Equipment

Brief details of equipment to be exhibited (but not the equipment) should be sent to A. J. Worrall, G3IWA, 62 Gallants Farm Road, East Barnet, Herts., tel.: ENTerprise 3352, who will acknowledge and send forwarding instructions.

List of Exhibitors

General Post Office
Salford Electrical Instruments Ltd.
Radio Society of Great Britain
Wireless World
British Amateur Television Club
Fansons Electronics Ltd.
Green Electronic & Communication Equipment Ltd.
Peter Seymour Ltd.
T. Withers (Electronics)
Alfred Imhof Ltd.
Enthoven Solders Ltd.
Short Wave Magazine Ltd.
Electroniques (Felixstowe) Ltd.
Codar Radio Company
K. W. Electronics Ltd.
Daystrom Ltd.
J-Beam Aerials Ltd.
Formica Ltd.
Radio Society of Great Britain Construction Competition
Partridge Electronics Ltd.
P. F. Ralfe Radio
Roding Boys Radio Society
Royal Navy
Amateur Radio Mobile Society
REME
Weller Electric Corporation
Ad Auriema Ltd. (National Radio of America)
Brian J. Ayres & Co.
Grampian Reproducers Ltd.
WAMRAC
Baden-Powell House Scout Amateur Radio Group
Northern Polytechnic
Selray Bookshop
Kelvin Electronics Co.
Amateur Tape Recording Magazine
International Short Wave League

QUA Associates

conducted by "JIX"

WE are approaching Showtime again. The many attractions of Seymour Hall, not least the chance to meet friends from other places again, revive our interests and help to keep Amateur Radio a vital activity.

I remember writing in "*QUA . . .*" last year that the Exhibition provides a chance to meet and discuss common interests, and I was very pleased to make personal acquaintance with a number of you then. Since that time, quite a few boys have become "A" members of the Society, and many will be making their first visit to an Amateur Radio Show this year. As we have observed before in recent "*QUA . . .*" columns, many of the new members show a keen interest in affairs outside their own small circle, so this year, more than ever, we may find groups of you meeting to exchange ideas. What is wanted are a few members to show their organizing ability in planning a simple programme for events such as this. So what about ideas and offers?

I shall certainly look out for any visitors who would like to meet and have a chat. I hope to be around the back hall on Friday and Saturday, where our Group will be organizing an exhibition stand again. The Roding Boys' Society will be pleased to show teachers and Youth Leaders what can be done with young people, so come along and have a discussion if you are interested. "A" Members and other young visitors are very welcome, as I mentioned. So look in if you can, and at least sign our visitors book!

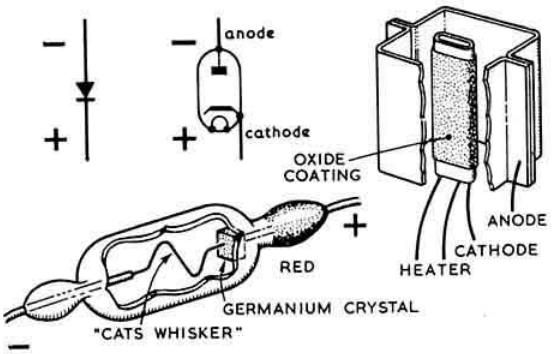


Fig. 1. The two main types of diode work the same way in that they offer a high resistance one way, but low in the other direction. The positive and negative ends shown on both the semiconductor and thermionic diodes is the polarity if the device is used as a rectifier.

D is for Diode

As "di" means "two", "diode" literally stands for a device with two electrodes. This description could obviously mean anything from a torch battery to a solar cell, but the word diode is now strictly reserved for a two electrode thermionic or semiconductor valve. The action of these devices is to offer a very high opposition to current flow in one direction, but a very easy path in the other. In fact, electrons can only flow into the cathode and out of the anode (Fig. 1). The purpose of such devices is to change a.c. to d.c., that is *rectification*. The "to and fro" motion of the current is changed to "fro" only. This rectification is needed in power packs to produce d.c. from a.c. mains, and plays a vital part in the detector stage of receivers.

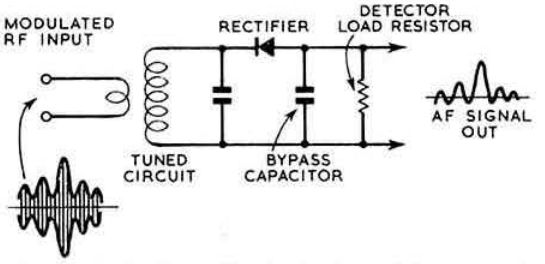


Fig. 2. The r.f. signal is rectified by the diode. A bypass capacitor removes the remaining r.f. pulses and the a.f. signal voltage is developed across the load resistor.

Detector or Demodulator

When a high frequency carrier wave is amplitude modulated at the transmitter, the audio or voice frequencies raise and lower the magnitude of the carrier oscillations in sympathy. At the receiver, the carrier oscillations are *rectified*; that is, half are removed, and the pulsating d.c. remaining is smoothed. Because the amplitude is varying with the a.f. modulation, so will the "d.c." from the rectification. This varying d.c. is, in fact, the a.f. ready to operate the 'phones or speaker. It is important to select the component values carefully to ensure that the r.f. is smoothed properly, but not to the extent that the a.f. is distorted with too much capacity. Very often a diode is used as the rectifier as discussed in the section above. When a rectifier is used in this role it is termed the *detector stage*.

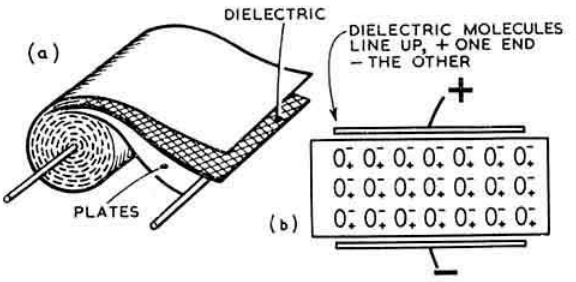


Fig. 3. The tubular capacitor type construction is shown in (a)—the plates and dielectric are rolled up; (b)—gives a picture of how a dielectric works. The particles of the insulator "line up" and affect the electric field, and therefore the charge on the plates.

* K. L. Smith, G3JIX, 82 Granville Road, Walthamstow, London, E.17.

Dielectrics

Substances which do not conduct electricity are called insulators. They are also called *dielectrics*, especially when referring to one particular property. This is the ability of some substances to increase the capacity of capacitors when it is placed between the plates. The number of times the capacity is increased, compared to a vacuum, is called the *dielectric constant*, symbol K, of the material. Typical dielectrics include air, which increases the capacity by only ·0006 relative to a vacuum; glass, whose dielectric constant is about 5; paper, with a dielectric constant of about 2·5; mica, $K = 7$; and ceramic materials, K about 80. Dielectrics work because the atoms in the substance with their positive nuclei and negative electrons, intensify the electric field between the capacitor plates.

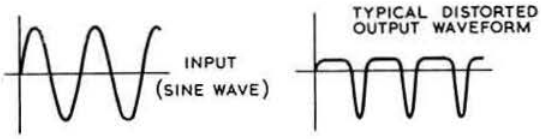


Fig. 4. Most distortion in amplifiers is caused by "clipping" the peaks of the signal. The change in shape means that harmonics have appeared.

Distortion

The output of all amplifiers is different in quality compared to the input. This is because they are all *non-linear* devices, that is, the output does not vary in proportion with the input (see "Amplifiers" under "A" in the May issue). Distortion occurs in many forms. If the shape of the output waveform is changed by the amplifier adding harmonics then we say *harmonic distortion* is occurring. If the amplification is not the same at all frequencies, then it is *frequency distortion* that is being produced. If signals of different frequency are delayed in the amplifier by various unrelated times then phase distortion is occurring. All kinds of tricks are used to reduce the effects of distortion, particularly, negative feedback. A class C r.f. amplifier is a very heavy distorter, but the tuned tank circuit gets rid of the harmonics, restoring the pure sine wave. However, it is vital to use a non-distorting amplifier in an s.s.b. linear amplifier stage.

Letters this Month

Graham Bolitho, A4697, lives in a bungalow at Maghull near Liverpool. This makes putting up a high aerial rather difficult. Gray uses two home-made receivers, and a very modified No 19 set. The QSL question came in A4697's letter. I feel that if an s.w.l. wants to report on interesting signals, then he should go ahead. As we mentioned before, the best reports would probably take on the form of scientific observations on the signal, and obviously intended to be valuable to the originating station. Reports which clearly just hint that it is QSL cards that are being sought probably receive the least attention.

R. Gifford-Hull, A4700, writes to "*QUA* . . ." for the first time. A4700 lives in Surrey, and has a 20m dipole feeding his HRO. He would very much like to contact any other "A" Members who may be living near him. His address is; Aveley Lacy, Ruxley Crescent, Claygate, Surrey.

Gillies, A3699, is keeping in touch. His latest letter describes a visit round a GPO radio station while on holiday in the Portpatrick area. Very interesting by the sound of it. Gillies seems to be having trouble with image interference. Any remedies?

Another first time letter, from **Duncan Hare, A4549,** who is at Felixstowe. He is using an R107 with a 150 ft wire to a 40 ft mast. Duncan has passed the RAE and hopes to have the Morse polished off soon. So there might be another call in Suffolk soon.

Philip Reilly, A4035, also comments on the QSL situation. He says that the following points have helped in his case: (i) QSL newly licensed stations; (ii) Don't send reports direct to given QRAs, only via the bureau; (iii) Don't send reports direct unless specially requested. Philip also expresses a few opinions about a radio or TV programme for radio amateurs. Nothing much has developed about this possibility, what we want is someone to write a script which will be accepted. What about it some of you budding script writers?

By the way, mni tnx to A4700 and A4473 for stamped addressed envelopes this month, they were very helpful.

I received a letter from **Len Butler, G2BUL,** gently chiding me about my absence of envelopes at the QSL bureau. Len deals with the "A" and "BRS" Members' reports, that is mainly why he dropped me a line . . . we both have dealings with Associates in our various ways. Len's address is 995 London Road, Thornton Heath, Surrey, and it is via him that your cards should go.

That is about all for this month, so if I don't see you personally in the meantime, 73 until November. JIX.

RAE Courses

The following courses supplement the list published on page 617 of the September issue.

Bromsgrove. A course has been arranged with the assistance of the Bromsgrove and District Amateur Radio Club. Details are available from J. K. Harvey, 22 Elm Grove, Bromsgrove, Worcester.

High Wycombe. RAE and Morse classes will be held on Tuesdays (Morse) and Fridays (RAE), 7-9 p.m., at the High Wycombe College of Further Education, Queen Alexandra Road, High Wycombe.

Manchester. The preparation course held for the RAE commenced September 20 at the Monton Evening Institute, Park Road, Eccles.

Portsmouth. For the 17th year an RAE course is to be held at the North End Evening Institute, Drayton Road, Portsmouth. Applications and enquiries to the Secretary, Eastney Modern Boys School, Reginald Road, Portsmouth.

RADIO AMATEURS' EXAMINATION

Thursday, December 9, 1965

MARY WARD HALL
5 TAVISTOCK PLACE
LONDON W.C.1.

The examination will commence at 6.30 p.m.

Applications to sit the Examination at the above centre, which is near Russell Square Underground, should be sent to the General Manager, Radio Society of Great Britain, 28 Little Russell Street, London W.C.1, to arrive not later than **Monday, November 1, 1965.** Applications must be accompanied by a remittance for the City and Guilds of London Institute fee of £1.10.0, plus, in the case of non-members of RSGB, a local fee of 5s.

CONTEST NEWS

RESULTS — REPORTS — RULES

1296 Mc/s Contest 1965

This contest, held on May 30, was introduced as an experiment at the suggestion of several members who found the last few hours of the 420 Mc/s contest rather unprofitable. In previous years a few stations have tested on 1296 Mc/s during this time and this year a contest was held running at the same time as the last six hours of the 420 Mc/s contest.

The winner was J. Fishpool, G3KEF, operating portable, who will receive a Certificate of Merit. The longest distance two-way contact was 45 miles between G2CIW near Birmingham and G3BNL, 7 miles south of Nottingham although G3FP (the runner-up) was heard by G3NBQ at a distance of 98 miles for a cross-band contact.

G3KEF and G3NBQ thought the contest a welcome addition to the calendar and both would like to see the 1296 Mc/s tests replaced by two such contests to give "the interest of direct competition." Several entrants considered that the 420 Mc/s contest could well end when this contest starts. The award of points for cross-band working was well received, and G3NNG suggested that the segment 1296 and 1298 Mc/s would be sufficient for the contest, and reduce the amount of tuning needed searching for signals in the noise.

Many unsuccessful attempts at cross-band contacts were reported and there was far more activity than the results table indicates. The weather generally was not favourable; the 6 ft. parabola at G3NNG/P had to be held on the ground owing to the high winds experienced. GW3ATM (Monmouth) heard G3MPS (Bridgwater) but the latter had receiver trouble, as did G3OXD/A. All comments received were favourable and the contest will be repeated next year on Sunday, May 29.

RESULTS

Posn.	Call-sign	Points	Contacts two-way	Contacts cross-band	Location	Input (watts)	Final	Aerial	Receiver
1	G3KEF/P	2270	5	2	8 East Rugby	20	2C39A	16 ele.	K6AXN
2	G3FP	1788	5	4	Croydon, Surrey	80	2C39A	3 ft. dish	Cavity
3	G3LTF	1675	5	4	3 S. Chelmsford	20	2C39A	32 ele.	
4	G3NBQ	1395	2	4	3 N. Coventry	50	2C39A	Trough reflector	Trough line
5	G8AL	1350	6	1	Woodford, Essex	—	—	—	—
6	G2RD	1125	5	3	Croydon, Surrey	30	TD1-100	8/8	Cavity
7	G2CIW	1110	4	1	4 S.W. Birmingham	60	3CX100A5	Corner reflector	Trough line
8	G3NNG/P	845	1	4	6 W. Wantage, Berks.	10	2C39A	6 ft. dish	GM0290 r.f. amp.
9	G3ORL/A	460	2	1	1 N. Danbury, Essex	6	Det 22	48 ele.	
10	G2FCA	395	2	1	Middlesex	—	—	—	—
11	G3OBD/P	300	1	0	5 N.W. Blandford, Dorset	15	DET24	4 ft. dish	
12	G3EGV/P	160	1	0	6 S.W. Newbury	6	2C39A	Trough reflector	K6AXN
13	F3FIJ	290	2	0	Colchester	8	2C39A	23 ele.	K6AXN
14	G5FK	140	1	0	Wembley	30	2C39BA	2 ft. dish	K6AXN

The following stations were also known to have been active on the band during the period of the contest: G5DT, G8RW, G2FNW, G3BNL, G3GDR, G3GWL, G3KFD, G3LQR, G3MCS, G3MPS, G3OXD/A, G3RPE, G8AFY and GW3ATM.

Low Power Contest 1965

RESULTS

Position	Call-sign	Points	Power (Watts)
1	G3JVJ	1805	0·5-2
2	G3EUE	1560	0·5
3	G3FM	1555	0·47
4	G3LHJ	1050	0·4
5	G3NEO	915	0·5-5
6	G2BHN	655	0·45
7	G3CWL	620	0·45
8	G3SIA	592	0·5-3
9	G3SHY	516	0·4-5
10	G3ORU	477	5
11	G3IGU	392	3
12	G4AL	260	0·48
13	G3NUA	195	0·45
14	GM3TLI	128	5
15	G3KSK	106	5

This contest was held on April 4 and attracted 15 entries: three fewer than for last year's contest.

This year, the highest score was made by G3JVJ who used 0·5 watt for all contacts except one, with an inverted V aerial some 50 ft. high at the centre. Runner-up is G3EUE who makes a welcome return to this contest after several years absence. G3FM was very close behind in third place but unfortunately made an error in receiving a report otherwise there would have been a tie for second place.

There was no entry from GW this year but an entry from GM3TLI saved the contest from being a one country event.

Equipment used varied very considerably from TT11, 6AK5, 3D6 p.a.s to a single 6J5 Hartley oscillator. Aerials varied from 265 ft. long wires to a 14 Mc/s ground plane.

Conditions generally seemed to be quite good favouring the longer distance contacts; but things got a little tough from 17.00 to the end of the contest.

Comments from Competitors

G3JVJ notes that CQs did not produce very many answers and that there was no lack of QRO Stations to call all day. He made 62 contacts in 29 counties and seven countries with the best DX as GM3COV, Thurso; a distance of some 500 miles.

G3EUE thought that the length and timing were just right and feels that there might be support for a second contest in the autumn. This last point will be given early consideration by the H.F. Contests Committee.

G3SIA found it difficult to get serial numbers and locations from stations not entering the contest (these are, in fact, not needed).

This contest seems to have been enjoyed by everyone so perhaps we can hope for a bigger entry next year and even some check logs from non-transmitting members.

Slade D/F Qualifying Event

The Slade Qualifying Event on August 1 was blessed with bright sunny weather, and 13 teams assembled at the start on Clee Hill, 1350 ft. a.s.l.

The "A" station, G3BXF/P, was well hidden on a steep hillside above Dowles Brook in the heart of the Wyne Forest. The "B" station, G3SRS/P, was hidden by virtue of situation, rather than elaborate camouflage, being placed on a hill near a path which followed the route of a long forgotten railway. Both stations were about eight miles from the start, and with four-and-a-half miles between them. The routes to both stations required a considerable amount of walking, rather than longer distances by car, a feature that was welcomed by most entrants. Five competitors found both stations, the redoubtable Mr. E. L. Mollart of Oxford again being first by 20 minutes. The Oxford society showed their high ability at D/F by entering five teams, and taking the first four places.

Afterwards, everyone enjoyed an excellent tea at the George Hotel, Bewdley, following which the results were given and prizes presented. Mr. D. A. Findlay was a welcome visitor.

Thanks are due to the Rugby transmitting team who operated the "A" station, without whose help the contest would not have been possible, and also to Mr. P. West, G3JPN, for operating the communicating station at the start and assisting as starter. The

assistance of the many other willing helpers was much appreciated, for without them the contest would not have been such a success.

Position	Name	Time of Arrival Station A	Station B
1	E. L. Mollart	15.39	14.43½
2	M. P. Hawkins	15.59	15.03
3	E. W. Bristow	16.03	14.43
4	V. F. Bratton	16.24	15.08
5	P. M. Williams	16.27	15.06
6	J. R. Vickers	—	14.47
7	G. Nicholson	—	15.21½
8	W. North	—	15.24
9	D. Wilson	—	15.30
10	I. R. Butson	—	15.45
11	D. Newman	16.09	—
12	G. T. Peck	—	16.22

Second 1·8 Mc/s Contest 1965

The rules for this year's Second Top Band Contest are as follows:

1. **When:** 22.00 GMT on Saturday, November 20, 1965, to 08.00 GMT on Sunday, November 21, 1965.
2. **Eligible Entrants:** All fully paid-up members of the RSGB resident in G, GC, GD, GI, GM and GW.
3. The General Rules published in the January, 1965 issue of the RSGB BULLETIN relating to RSGB Contests will apply.
4. **Contacts:** C.W. (A1) only in the 1·8-2 Mc/s band.
5. **Scoring:** Three points for contacts with stations in the entrant's own county and those counties having a common boundary with that of the entrant and five points for all other contacts.
6. **Contest Exchanges:** RST reports followed by the contact number starting with 001 and the county code letters given on page 50 of the January, 1965, issue of the BULLETIN, e.g. for a contact from Surrey 579005SY. All reports must be acknowledged with " R ".
7. **Logs:** (a) Must be tabulated in columns headed (in this order): " Date/Time GMT," " Call-sign of station worked," " My report on his signals and serial number sent," " His report on my signals and serial number received," " County code letters received," " Points claimed." The county code letters as sent must be entered at the top of each log sheet.
(b) The cover sheet must be made out in accordance with RSGB Contests Rule 4. The declaration must be signed.
(c) Entries must be postmarked not later than **December 6, 1965.**
8. **Power Input:** The d.c. input to any stage of the transmitter shall not exceed **10 watts.**
9. **Awards:** At the discretion of the Council, the **Victor Desmond Trophy** will be awarded to the winning station and certificates of merit to the stations placed second and third. In addition, the **Maitland Trophy** will be awarded to the Scottish member with the highest aggregate number of points in this contest combined with the First 1·8 Mc/s Contest 1966.

A certificate of merit will also be awarded to the **non-transmitting member** submitting the best check log. Check logs submitted by non-transmitting members for consideration for the award of a certificate of merit should give in this order the following details: Date/Time (GMT); Band; Call-sign of station heard; Report and serial number sent by station heard; Call-sign of station being worked; any other information required by the above rules.

Affiliated Societies' Contest 1966

The rules for the Affiliated Societies' Contest to be held on January 15/16, 1966, are as set out below. The attention of non-contestants is called to Rule 6. It is not in the spirit of this Contest that a Society station should be operated by only one member for all or nearly all the time and entries which indicate this method of operation may be rejected by the Contest Committee.

1. The contest is open to all Societies in fully paid-up affiliation with RSGB at the time of the Contest. Societies may enter more than one station provided that different call-signs are used.
2. The General Rules to be published in the January 1966 issue of the RSGB BULLETIN relating to RSGB Contests will apply except as superseded by the rules of this Contest. For the purpose of this Contest **all entries are classed as multi-operator stations.**
3. The Contest will be in two periods:
19.00 to 23.00 GMT January 15, 1966 and
19.00 to 23.00 GMT January 16, 1966.
4. Entrants must operate in the 1·8 Mc/s band on c.w. only, and operate in such a way as to minimize interference with other band users. Contacts with telephony stations are not permitted.
5. Fifteen points will be scored for contacts with Affiliated Society stations, and five points for all other contacts. Contacts may be made once only with a station during each operating period. The contest score will be the sum of the points obtained in both periods, and the combined log will be prefaced by a cover sheet made out in accordance with RSGB General Rule 4.
6. Affiliated Society stations **only** must send AFS to identify themselves as contestants, after the report serial number groups, e.g. 559004AFS. Serial numbers will advance throughout the entire contest.

CONTESTS DIARY

October 2-3	- VK/ZL Contest (Phone).
October 2-3	- WADM Contest (C.W.)
October 9-10	- Raynet Rally. (see page 614)
October 9-10	- VK/ZL Contest (C.W.)
October 16-17	- 7 Mc/s DX Contest (Phone). (see page 474, July 1965).
October 23-24	- CQ World Wide Contest (Phone).
October 30-31	- VU2/4S7 Contest (C.W.)
November 6-7	- 7 Mc/s DX Contest (C.W.) (see page 474, July 1965).
November 6-7	- VU2/4S7 Contest (Phone).
November 13-14	- Second 432 Mc/s Contest (see page 543, August 1965)
November 20-21	- Second 1·8 Mc/s Contest.
November 28-29	- CQ World Wide Contest (C.W.) (see page 650).
December 5	- Fourth 70 Mc/s Contest (C.W.).

1966

January 15-16	—Affiliated Societies' Contest
January 30	—First 144 Mc/s (C.W.) Contest
February 13	—First 70 Mc/s (Open) Contest
February 19-20	—First 1·8 Mc/s Contest
March 5-6	—Second 144 Mc/s (Open) and 144 Mc/s Listeners' Contests*
March 19-20	—BERU (see page 609)
April 3	—Low Power Contest
April 16-17	—Second 70 Mc/s (Open) and 70 Mc/s Listeners' Contests*
April 24	—D/F Qualifying Event
May 8	—Third 144 Mc/s (Portable) Contest*
May 22	—D/F Qualifying Event
May 28-29	—First 420 Mc/s (Open) Contests*
May 29	—1296 Mc/s Contest
June 4-5	—National Field Day
June 19	—D/F Qualifying Event
July 3	—Fourth 144 Mc/s (Portable) Contest*†
July 9-10	—1·8 Mc/s Summer Contest
July 17	—D/F Qualifying Event
July 24	—Third 70 Mc/s (Portable) Contest†
July 31	—D/F Qualifying Event
September 3-4	—V.H.F. NFD*†
September 11	—80 Metre Field Day
September 18	—D/F Final
September 24-25	—21-28 Mc/s Phone Contest
October 15-16	—Second 420 Mc/s Contest*†
October 29-30	—7Mc/s DX (Phone) Contest
November 12-13	—7 Mc/s DX (C.W.) Contest
November 19-20	—Second Top Band Contest
December 4	—Fourth 70 Mc/s (C.W.) Contest*†

* Qualifying contests for V.H.F./U.H.F. Listeners' Championship
† Dates subject to revision

7. Call-signs which have been issued to Societies must be used, but their use at an alternative address is not debarred. If no Society call-sign is held the call-sign of a member may be used. More than one entry will be accepted from a club or society provided that where a club call-sign has been issued, that call-sign is used for the " A " station. Additional entries must use members' call-signs.
The contest is organized to promote club activity and it is not in the spirit of the contest that a station be operated for most of the contest period by only one operator.
8. Entries must be postmarked not later than **January 31, 1966,** and must be submitted in the following form:

Date/Time GMT	Call-sign of station worked	Our report on his signals and serial no. sent	His report on our signals and serial no. received	Enter AFS if received	Call-sign of Operator	Points Claimed

Cover sheets and log forms are available from RSGB Headquarters on request.
9. The declaration must be signed by an officer of the Affiliated Society, who will be held responsible for the conduct of the station(s).
10. At the discretion of the Council of the RSGB, the **Edgware Trophy** will be awarded to the Affiliated Society submitting the highest total checked score.

(Continued on page 690)

NEWS . . .

Collated by John Clarricoats, O.B.E., G6CL

Retired. David Houghton, Circulation Manage of ARRL for the past 22 years and a member of the League's staff for 44 years, retired on August 31, 1965. Before that date David's countless friends throughout the world were invited to contribute testimonials and expressions of appreciation for his past services to Amateur Radio. These letters are now being bound in book form for presentation at a ceremony at League Headquarters later this month. Although at the very heart of US Amateur Radio since 1921 Mr. Houghton does not hold an amateur transmitting licence . . . but there's still time!

ITU Plenipotentiary Conference. One hundred and fifteen of the 127 Member Countries forming the International Telecommunication Union are represented at the Plentipotentiary Conference which opened in Montreux, Switzerland, on September 14, for a period of nine weeks. The present Conference is only the ninth occasion on which such a meeting has been held in the ITU's 100 years of existence. The founding Conference met in Paris in May 1865 and succeeding Conferences took place in Vienna in 1868, Rome in 1871-2, St. Petersburg in 1875, Madrid in 1932, Atlantic City in 1947, Buenos Aires in 1952 and Geneva in 1959. The Swiss Federal Government is acting as host to the present conference which is being held in the Montreux Palace. Mr W. A. Wolverson, C.B., Deputy Director of the GPO, is leading the UK Delegation.

Tom Clarkson, a Past President of NZART and a member of the staff of the New Zealand Post Office for 40 years until his retirement last year was a visitor to RSGB Headquarters last month. Tom Clarkson, who heard the first two-way contact take place between the UK (Cecil Goyder, G2SZ) and New Zealand (Z4AA) on October 19, 1924, recently met Frank Bell when members of NZART were present at a ceremony to unveil a commemorative plaque at the site of Z4AA's historic station at Weihemo. Mr. Clarkson was a member of the New Zealand delegation to the Atlantic City Radio Conference in 1947 where he put in good work " behind the scenes " for the Amateur Service. He is now at the ITU Plenipotentiary Conference in Switzerland.

Electrons in Harness is the title of a new 16mm Mullard film in colour available on free loan to radio and electronics societies. Its action is mainly set in the Mullard Research Laboratories near Redhill, Surrey, where scientists are working on the frontiers of knowledge. Electron beam machining, high vacuum techniques, microwave devices, cathode ray tubes, colour television, super-conductivity, cryogenics and microcircuits are among subjects featured in the film. The Mullard maser installed in the giant dish at the GPO Earth Station, Goonhilly Down, is seen in a sequence dealing with the practical application of masers and transistors. The film, which runs for 40 minutes, is the thirty-first to be released by the Mullard Film Service. Applications for the loan of the film should be addressed to Mullard House, Torrington Place, London, W.C.1.

Coal-Powered TV. A standard television set is being operated directly from a handful of powdered coal at the Westinghouse Research Laboratories in order to demonstrate an experimental 100 watt fuel-cell system which converts gases from the coal directly into electricity. The system consists of a fuel-cell battery and a chemical reactor. The gases extracted from the coal, mainly hydrogen and carbon monoxide, interact with the fuel cells to produce electricity.

The British Amateur Television Club intend to run, as an experiment, a 70cm Amateur Television Contest concurrently with the next RSGB 70cm Sound Contest (November 13-14, 1965). In order not to interfere with those taking part in the RSGB event, vision transmissions will be made well clear of the 432-434 Mc/s section of the band. A typical operating procedure will be to establish contact in the 432-434 Mc/s section on sound and then to change frequency before exchanging vision signals.

At 7 p.m. on October 29, 1965, at a meeting of The Television Society to be held in the ITA Conference Hall, 70 Brompton Road, London, S.W.3, four members of BATC will review major activities of the Club during the past six years. RSGB members will be welcome.

Mullard Meetings are due to be held at the following places within the British Isles during the month of October. 4th, Eltham (S.E. London); Yorkshire Grey; 5th, Harpenden, Public Hall; 6th, Bedford, Civic Theatre; 13th, Canterbury, County Hall; 14th, Maidstone, Royal Star Hotel; 18th, Winchmore Hill (North London), Firs Hall; 19th, Ilford Town Hall; 20th, Glasgow, McMillan Galleries; 21st, Edinburgh, Leith Town Hall; 25th, Shrewsbury, Technical College; 28th, Guildford, Stoke Hotel. All meetings will commence at 7.45 p.m. and at each meeting the talk will be on transistors. The films to be shown are entitled Thin-film Microcircuits and Electromagnetic Waves, Part II. Applications for tickets should be made to Mr Ian Nicholson, Films & Lectures Organisation, Mullard House, Torrington Place, London, W.C.1.

Technical Merit Award of the ARRL has been presented to Project OSCAR Inc. in recognition of its work " in conceiving, constructing and orbiting an internationally successful 2 metre translator, known as *OSCAR III* ". The Merit Award was accompanied by a copy of a resolution, recording the achievement, adopted by the Directors of the ARRL at its Annual Board Meeting.

Martian Landscape Photographs reproduced in the national and scientific press, shot to earth from over 215,000,000 kilometres away by *Mariner IV*, were received with a power of less than 0·000,000,000,000,000,0001 watt!

Ionospheric Investigator. Changes in the ionosphere which affect radio communications are being studied by a huge circular direction-finding system at the University of Illinois. The system utilizes 120 poles, each 65 ft high, in a 955 ft circle, to support a reflective screen of 960 vertical wires. Around the outside of the screen are 120 aerial units, each 16 ft high connected to receivers located inside the building.

Post-Office Appointments. Mr A. W. C. Ryland, C.B., has been appointed a Deputy Director-General of the Post Office to succeed Mr W. A. Wolverson, C.B., who will be retiring in November. At the same time the functions hitherto exercised by the two Deputy Director-Generals will be re-allocated. Mr Alan Wolstencroft will be known as Deputy Director-General (Posts) and will be operationally responsible for the entire postal services. Mr Ryland will be known as Deputy Director-General (Telecommunications) with similar operational responsibilities.

Kiwanis International is undertaking a programme to foster person-to-person contacts internationally and to establish Kiwani clubs overseas. Radio amateurs who are members of Kiwanis and would like to participate in this programme should write to Judge L. T. David, W6QFA, 10633 Le Conte Avenue, Los Angeles, Calif.

Eighth Boy Scout Jamboree-on-the-Air will take place from 00.01 GMT Saturday, October 16 to 24.00 GMT Sunday, October 17, 1965. The event provides the scouts of one country with an opportunity to contact and exchange views with scouts of other countries. It is not competitive but Participation Certificates will be sent to those amateurs who take part in the Jamboree.

International Instruments, Electronics and Automation Exhibition for 1966 will be held at Olympia from May 23-28. Bookings are already well up on 1964 when 148 exhibitors out of 729 came from abroad.

Letters to the Editor

Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents. Letters for inclusion in this feature should be concise and preferably not more than 200 words in length.

Society Subscriptions

I have no doubt you will receive the usual barrage of complaints regarding the increase in the Society's subscription, e.g. " What's the Society doing for us? " " Why can't we economize and cut the cost of this, that and the other ? " You can add my moan to them! I feel that the recent increase is insufficient to properly support the Society's work, and is also about eight years overdue.

Anyone who *reads* the accounts must surely realize that we have been subsidizing subscriptions from the profits of our other activities, notably publications. This should never have been allowed to happen. We need a HQ, and the £50,000 or so required to purchase it with; we have numerous services to members such as QSLs, beacons, TVI, contests, scientific studies, technical, etc., all running on a shoe string. Before the empty vessels make too much noise, let me point out that the Scientific Studies Committee, of which I am a member, is allowed near enough 2d. per head to run its activities. The plain truth of the matter is that it cannot be done, and the results achieved to date have only been possible through the generosity of a few who have dipped into their own pockets.

This is not the way that any society should have to operate. Unfortunately, the radio market has for many years been a purchaser's paradise with " Government Surplus". Many people have come to think that everything connected with Amateur Radio should be on the cheap, and they think the Society should be on the cheap as well.

For my own part, I got rather fed up with being a very lone voice at AGM after AGM suggesting an increase in society dues. I have always believed in the old maxim " Save for a rainy day," and it seems to me that the Society is having a rather rainy day with the considerable increase of the HQ rent, and all our property bids being frustrated by lack of capital which over the past years has been used to subsidize members' subscriptions instead of being saved. There is only one way to run the Society —levy a subscription rate that is realistic for what has to be done —in my view at least £3 at the present time would only partly restore the profits which have been used to subsidize subscriptions over the past few years. As a " share holder " in Amateur Radio I want to see the company prosper, its profits being used to further the Amateur Radio cause, not handed out as subsidies. I should not want anyone to think I enjoy paying a higher subscription—I don't—but, at least, I realize it is necessary and long overdue.

C. E. NEWTON, G2FKZ

Blackheath, London, S.E.3.

Two-way Telephone System

The shack-to-kitchen telephone described by G3GKS prompts me to describe my arrangement, which costs only 5s.

I bought a pair of balanced armature earphones, type DLR5, and used one earpiece at each station. They are sensitive enough to be used as microphone as well as earpiece, without battery or amplifier. You have of course to move the unit between ear and mouth each " over," but this should not trouble a ham.

For calling I built an " exchange " consisting of a 200 ohm relay wired in series with its normally closed contact to act as a buzzer, in series with a 9 volt battery, connected across the lines at a convenient point. At each station a 25 μF electrolytic in parallel with a normally open pushbutton is connected in series with the earpiece. Normally the capacitors prevent the flow of d.c. through the buzzer, but when a pushbutton is pressed the buzzer d.c. circuit is completed through the calling earpiece, and the a.c. buzzer output is heard alike at each station. Any number of stations may be used, the calling tone being audible at all stations. The full shelf life of the battery is obtained as it is used only for calling.

R. C. MARSHALL, M.A., A.M.I.E.E., G3SBA

Harpenden, Herts.

V.F.O. Controlled Transmitter for 70 Mc/s

Congratulations to G3GFN on his 70 Mc/s transmitter article. His description of how to stabilize the v.f.o. is particularly valuable, and could be taken to heart at some stations where a drift of several kc/s at 1·9 Mc/s each over is apparently regarded as good space age performance. Certainly, this and his previous v.f.o. articles form the most useful treatise on practical v.f.o. construction I have seen for a long time. I believe that ultimately a triode such as the 12AT7 will give a better performance than most pentodes due to its better ratio of gm to CIN and COUT, but the ultimate stability of triode or pentode will only be achieved along the lines G3GFN suggests.

B. PRIESTLEY, G3JGO

Langley, Bucks.

C.W. on 2m

I wish to voice my support for Mr. Paul's remarks and suggestions regarding the use of c.w. on 2m (BULLETIN, September). I have made similar suggestions in the past but no support or criticism was forthcoming.

Will the V.H.F. Committee please give this matter serious consideration and perhaps give Mr. Paul's plea a trial of say 12 months. We already have a suggested s.s.b. frequency in the centre of the band. Surely the case for a c.w. segment (at either end) is stronger, yet no effort seems to have been made to formulate a plan.

For and against please. Or will apathy prevail?

W. M. LEE, GW3MFY

Bridgend, Glamorgan.

Do we talk to much?

A few weeks ago, readers of the BULLETIN were assailed by a letter from Mr. W. A. Scarr criticizing the BULLETIN. On that occasion I was in general agreement with his views.

However, such is not the case with the latest offering from G2WS, which displays an overpowering " I am holier than thou " attitude which I, and I am sure many other 2m stations, find somewhat distasteful.

It appears that Mr. Scarr not only wants the BULLETIN to be set out to his liking but also the operating habits of other amateurs must be tailored to suit his needs.

Surely, if two amateurs wish to discuss " petty domestic trifles " of a personal nature in which the Licensee, or the person with whom he is in communication, has been directly concerned, and here I quote the Amateur (Sound) Licence A, Clause 1 (1) (b) (i), then surely it is their business and nobody else's. If a listener, whether licensed to use a transmitter or not, does not wish to listen, he can always exercise his unique right to turn off his receiver.

Mr. Scarr's five rules can be condensed down to read: Operate in an intelligent well mannered way and keep to the licence regulations, which the vast majority of people do anyway.

If Mr. Scarr wants to listen to prime examples of unmitigated rubbish, poor operating, and never ending tirades of drivel, he should listen to 160m or 80m. Many, but by no means all of the guilty parties, are operators of similarly mature amateur radio years to himself.

I regret that I am not of the required social status to have first hand knowledge of the code of etiquette recognised by golfers, but I fail to see what any such code can have to do with operating an amateur transmitter on 2m or any other band for that matter.

I should like to draw Mr. Scarr's attention to his own rule (ii), as in my opinion suggestions such as rules of etiquette are merely rather petty attempts by a few people to show off to other amateurs that they have, by virtue of long personal experience in the hobby, become, at least in their own estimation, superior operators, who should be emulated by everybody else.

A. C. WADSWORTH, G3NPF

Rochford, Essex.

Bulletin Under Fire

I feel I must add my support to the efforts of Mr. W. A. Scarr to keep the technical standard of the articles in the BULLETIN to a level which the majority of its readers require. The RSGB is the " union " of licensed radio amateurs and serious listeners, and as such should be concerned primarily with supplying their needs. It should not try to enlarge its scope to include every level of knowledge, otherwise it will become so dilute as to lose its interest to everyone. After all, there are many other radio

journals which cater amply for the beginner. Everyone, however, does not want to see some standard circuit repeated with unerring regularity.

Regarding Mr. Coleman's praise of the articles currently appearing compared with standard textbooks (and their evaluation must surely be left to someone who does not yet know such rudiments), if they are that good let them be published as a pamphlet for beginners by the RSGB, leaving the pages of the BULLETIN for *topical* technical matters and reports (surely what a regular publication is for) and, let us not get too serious, the occasional humorous article.

This subject has stirred up much feeling amongst RSGB members, and I have heard many comments both over the air and from BRS members; all have been in general agreement with these views, and several threats to leave the Society have been expressed. After all, the BULLETIN is the only tangible contact most members have with the Society for our 50s., so let's have our money's worth!

G. H. GRAYER, G3NAQ

West Bromwich, Staffs.

I have read with great interest all the correspondence in recent issues of the BULLETIN which deals solely with the problem of " Material Interests."

It's obvious that no magazine, whether humorous, cultural or technical, will please the whims of all its readers, but it seems obvious that the majority of BULLETIN readers are solely content with pursuing the pure technicalities of their subject, and seem to reject the interests of the younger boy who indeed may well be the future specialist.

I agree entirely that the BULLETIN is a technical publication, and so it should be, but is it wrong to be so parochial, and to close softly the door of interest to the keen young individual. True he may well have all the details of Leyden jars in his school desk, but he may not like the textbook. It is because such items are alongside those of the more advanced, that some boys buy a better technical and informative magazine.

What then is the answer? for indeed it may not be so very well known, but many hundreds of boys are keenly interested in transmitting and receiving, and it would be unwise to have a Society magazine which was either unbalanced in its articles, interesting some, boring others. It is to the experienced that the young will always turn for advice, and many members of the RSGB have given this and their time freely. Would it not therefore be a better proposition to form an official Youth Department within the RSGB, together with its own Honorary Secretary, who would be solely responsible for either selected items, informative information, camps, liaison, and perhaps selected publication or article matter?

JAN FOSTER, G3NHS
Activities Officer, London
Federation of Boys' Clubs

222 Blackfriars Road, S.E.1.

The discussions about BULLETIN content following Mr. Scarr's letter have raised another issue which, until recently, received very little attention—namely the attitude of the Society to young beginners. Mr. F. Allan Herridge, G3IDG, seems to think it best to leave them to find out what they can without any assistance or guidance at all. This is all very well, but it is not nearly as easy as it sounds for a boy interested in radio to become a good amateur simply by reading textbooks and short wave listening. It is true that some of the more intelligent and persevering ones do make it in the end, as do those who belong to a good local club; but with such counter attractions as TV and pop music so prominent, and supported by such massive, carefully planned publicity, it is not surprising that many eventually give up in face of so little encouragement. I am even so reactionary as to suggest that many of today's much publicised " teenager " troubles could be avoided if more of them had constructive hobbies like Amateur Radio. Doesn't the RSGB as a responsible organization have some duty to society not only to give all possible assistance and encouragement to beginners, but also to make some effort to publicise the hobby among young people. The stand at the Boys' and Girls' Exhibition seems to be an excellent step in the right direction.

There is at present no handbook available that would form a really suitable introduction to Amateur Radio for a young enthusiast. The *RSGB Handbook* for example is far too comprehensive to start on, and the *RAE Manual*, whilst excellent for the purpose for which it was designed, hardly gives a realistic picture of modern Amateur Radio, neither does it do much to sustain the interest of a beginner. It is understandable that not many youngsters nowadays want to spend all their spare time studying textbooks, so something is needed that will maintain their enthusiasm by suitable constructional projects, and provide a guide to short wave listening. Mr. Herridge is frequently to be heard complaining about the operating practices of various people, but surely it is because they are picked up by listening on the air that these bad habits spread so quickly. A newly licensed amateur is bound to copy what he hears on the air unless he has been taught otherwise. How is he to know what is right and what is wrong?

I am not suggesting that the BULLETIN should become, as one correspondent put it, a " Schoolboys' electrical magazine," but also fail to see how 13 pages of beginners' articles in 285 (not counting adverts) can earn it this description. We should continue to encourage boys who are interested in radio to become Associates, and to devote a few pages to their special interests. However, the job of educating and encouraging prospective amateurs is really too big to be done in the BULLETIN alone, apart from the difficulty that the material would have to be repeated every few years. I would suggest that the Society consider the idea of preparing a handbook in several parts of increasing difficulty, with technical, constructional and general material suitable for the younger radio enthusiast. This would enable good operating procedure to be taught from the start, so increasing the value of short wave listening, and would illustrate the technical matter with constructional projects to help maintain interest.

If Mr. Herridge really wants to raise the prestige of the Society, can this not be done better by the proper education of potential recruits rather than expressing the pious hope that they will somehow " pick it up " on their own (and then complaining when they do it wrong).

A. J. SHEPHERD, G3RKK

Coulsdon, Surrey

(Mr Shepherd has omitted to mention *A Guide to Amateur Radio*, the eleventh edition of which has just been published. The *Guide* endeavours to explain the basic elements of amateur radio in simple language.—EDITOR).

When I was at school I used to look forward to seeing the BULLETIN. At that time " Uncle Tom " was a regular contributor, and well do I remember his parody written in the style and rhythm of Hiawatha, when amateurs were charging into 20m with all the enthusiasm those years of opening vistas of DX produced. Two lines still remain clear in my memory:

". . . Started up on twenty meters, overcrowded twenty meters, with a note just like a hacksaw, hard at work on aluminium."

In my prefect's cap I visited " Uncle Tom " in his shack, and was delighted to see his p.a. valve, removed from its base, up-ended in a jam jar with the connections tastefully bent out over the rim. Here, I thought, is the stuff of which pioneers are made, and how right I was! Two lines written in gentle irony more than 30 years ago kept the c.w. note of one ham, at least, clean ever since.

The days of the pioneer are over; no longer does the ham explore the medium with the commercials following up. We wait for the commercials to discard their old equipment and buy it up at bargain prices, to flog along behind the commercials. Our hobby is the serious pursuit of something (I am not sure what, but it could be connected with ego) and must not be sullied by frivolity.

Must the BULLETIN ape the journals of the professional institutions? Should we change the name to " The Proceedings of the RSGB "? Dare we publish a colloquialism, or raise a quizzical eyebrow?

What is wrong with humour in the BULLETIN, anyway? Amateur Radio is a hobby, and hobbies are fun, and the RSGB is our club which we have formed to keep us in touch with our fun as well as s.s.b. I have read your correspondents' letters on the BULLETIN with frustrated impatience. We are even quoting our fun in terms of statistics! How pompous we have become! Let us be debunked by humour.

Incidentally, whatever happened to the wouff-hong?

N. H. SEDGWICK, G8WV

Newport Pagnell, Bucks.

News from Headquarters

Reciprocal Licensing

The Society has been advised by the Post Office that reciprocal licensing agreements have been signed with Austria, Luxembourg and the Netherlands.

The Post Office will advise the RSGB when applications from amateurs from these countries can be accepted. This is expected to be shortly, when the terms of the licence and the application document details are settled.

The G5RV Trophy

The Council has accepted with pleasure a generous offer by Mr. Louis Varney, G5RV, to donate a cup to the Society. The cup will be known as " The G5RV Trophy."

The rules governing the award of the new trophy are as follows:

(i) The trophy will be awarded annually by the Council of the Radio Society of Great Britain for the most meritorious contribution in the field of Amateur Radio space communication.

(ii) The trophy may be awarded for any other object which the Council may decide as being most suitable.

The Council has decided that the recipient of the G5RV Trophy is to be Mr. W. Browning, G2AOX, in recognition of his work in connection with orbital prediction for the *Oscar III* translator satellite.

The Ockenden Venture

The Ockenden Venture, a charity which gives home, health and education to Stateless and Refugee Children, receives very active support from a group of radio amateurs who issue a special certificate to those who work five of their number.

Ockenden is giving care to over 350 children from Displaced Persons Camps in Germany and still finding children living in appalling circumstances with no chance of an improved life unless help is given from outside. One source of income for Ockenden is the sale of Christmas cards. Members who wish to help the work in this way, may obtain an illustrated brochure from the Christmas Card Dept., The Ockenden Venture, White Rose Lane, Woking, Surrey.

Mr. P. C. M. Smee appointed Assistant Secretary

Acting on the advice of the Finance and Staff Committee, the Council has appointed Mr. P. C. M. Smee Assistant Secretary.

Mr. Smee joined the Headquarters staff as bookkeeper/assistant in February 1964.

Mr. John Adey, A4663

Mr. John Adey, A4663 has joined the Headquarters staff as a trainee editorial assistant on the RSGB BULLETIN and other publications.

New Mullard Filmstrip

A new 27-frame colour filmstrip entitled " Semiconductor Diode Circuits " is announced by the Mullard Educational Service.

The strip describes the construction and theory of semiconductor diodes and their use in power supply units, radio and television, computers and miscellaneous applications.

Copies may be ordered at a cost of 25/- per strip from:

Unicorn Head Visual Aids Ltd.,
42 Westminster Palace Gardens,
Artillery Row.
London, S.W.1.

RSGB QSL Bureau Sub-Managers

The following is a list of the RSGB QSL Bureau Sub-Managers showing the call-sign groups for which they are responsible:

G2:	J. W. Russell, G2ZR, 45 Shakespeare Avenue, Bath.
G3, 4 and 5 two-letter calls & GC:	E. G. Allen, G3DRN, 65A Melbury Gardens, London, S.W.20.
G6 and G8:	A. J. Mathews, G6QM, 62 Ashlands Road, Hesters Way Estate, Cheltenham.
G3AAA-BZZ:	C. C. Olley, G3AIZ, 157 Wanstead Park Road, Ilford, Essex.
G3CAA-DZZ:	C. A. Bradbury, BRS1066, 13 Salisbury Avenue, Cheltenham.
G3EAA-HZZ:	W. J. Green, G3FBA, " Meadway," Links Avenue, Brundall, Norfolk, NOR86Z.
G3IAA-KZZ, BRS and A numbers:	G. L. V. Butler, G2BUL, 995 London Road, Thornton Heath, Surrey.
G3LAA-MZZ:	C. Harrington, BRS2292, 91 Brabazon Road, Hounslow, Middlesex.
G3NAA-NZZ:	C. R. Emary, G5GH. New address to be published later.
G3OAA-PZZ:	J. H. Brazzill, G3WP, 43 Forest Drive, Chelmsford, Essex.
G3RAA-RZZ:	K. Walden, G3OLN, 250 Gloucester Road, Cheltenham, Gloucestershire.
G3SAA-TZZ:	E. G. Allen, G3DRN, 65A Melbury Gardens, London, S.W.20.
G3UAA-WZZ:	P. R. Cox, G3RYV, 38 Ridgway Crescent, Tonbridge, Kent.
GD:	T. R. Moore, GD3ENK, " Glyn Moar," St. John's, Isle of Man.
GI:	R. R. Parsons, GI3HXV, 45 Erinvale Avenue, Finaghy, Belfast.
GM:	D. Macadie, GM6MD, 154 Kingsacre Road, Glasgow, S.4.
GW:	J. L. Reid, GW3ANU, 28 Waterston Road, Gabalfa, Cardiff.
DL2:	Cpl. C. Thomas, DL2CT, Box 125A, RAF Butzweilerhof, BFPO 19.

Cards must be sent to G2MI but envelopes may be sent to the appropriate Sub-Manager or to G2MI. Printed, gummed labels are obtainable from G2MI by sending an s.a.e.

The address of the QSL Bureau Manager (Mr. A. O. Milne, G2MI) is 29 Kechill Gardens, Bromley, Kent.

Postage, letter rate: 2 oz. 4d., and 2d. for each additional 2 oz.

RTTY Channel on 2m

It is regretted that the notice on page 577 of the September 1965 issue of the BULLETIN was published in error. The matter is, however, still under consideration.

Headquarters Fund List No. 27

The following are additions to the list of those who have contributed to the fund: R. E. Lord, GW3NCT, M. Fern, KH6ARL, A. J. Machin, G3POU, H. Jens, DJ3OD, E. J. Davis, G3SXY, H. Hutson, G6GH, H. D. Strieter, W4DQS.

Total amount contributed to date: £2,065 1s. 7d.

1965 Mullard Award

This year the Mullard Award Committee, instead of presenting the Mullard Award to one person, will be awarding it jointly to Mr. and Mrs. J. A. Woolley, G3ESR and G3LWR. This is in recognition of their outstanding services to the Radio Amateur Invalid and Bedfast Club, of which G3ESR is Honorary Treasurer, and G3LWY is Honorary Secretary.

The Award will be presented to Mr. and Mrs. Woolley at the RSGB International Radio Communication Exhibition on October 27.

Affiliated Societies' Representatives

The Honorary Secretary of each society affiliated to the RSGB automatically becomes the ASR (irrespective of his personal membership or otherwise of the RSGB) unless the members of a particular society desire to nominate and appoint another of their members to serve as ASR. In that event the Council suggest it would be desirable for the person nominated to be a Corporate Member of RSGB.

ASR's are not eligible to claim expenses from the RSGB.

Avoiding Spot Frequency on 80m

The frequency 3683 kc/s has been allotted to the Army Department for communicating between a shore station and vessels on passage in coastal waters. Whereas the shore transmitter has a power output of 250 watts the output of the ship transmitters is only 50 watts with very limited aerial arrays. It is therefore very easy for amateurs to cause interference and interrupt communication between the shore station and ships at sea.

Where it has been possible to attract the attention of amateurs they have always been most co-operative in moving off the frequency. However, this has not always been possible. It is realized that this is a shared band but the Army Department would be most grateful if amateurs would avoid the use of this spot frequency.

Free QSL cards

V. J. Reynolds G3COY, RSGB Area Representative, in co-operation with the publicity department of the City of Stoke on Trent, is arranging for a free issue of QSL cards.

Amateurs and s.w.l.s living *within the postal area of Stoke on Trent*, who wish to obtain these cards, may forward their name, address, call-sign, (or BRS,A number) to G3COY, 90 Prince's Road, Hartshill, Stoke on Trent, Staffs.

Experimental Station in the Netherlands

PE2EVO is a new experimental radio station which will usually be available for 24 hours a day to give accurate signal reports and other details of transmissions to amateur testing equipment. It is hoped to have equipment for all the usual amateur bands shortly, so that continuous observations of conditions can be made, the results collated and published. The opportunity will also be taken of testing various types of equipment. It is planned to move PE2EVO to the permanent exhibition building EVOLUON at Philips, Eindhoven, next year from October 1, and any amateurs visiting the Netherlands after that date will be welcome to visit the station.

Correction

The reference to VS9MB in the BERU Contest 1965 Results on page 604 of last month's issue should have read VS9MG.

G3KBC moves to New Zealand

J. L. Cutler, G3KBC, will be emigrating to Auckland, New Zealand on October 25. This opportunity has been taken to notify all his Top-Band and 2 metre friends of the event, as it is not possible to contact all of them over the air. G3KBC hopes to obtain a ZL call to enable him to keep in touch with the United Kingdom.

NORTHERN RADIO SOCIETIES CONVENTION

October 10, 1965

BELLE VUE MANCHESTER

The attractions include:

- Local societies' stands
- Trade stands
- Radio stations (on 160m, 80m, 20m, 2m and 70cm)
- Mobile Rally
- Model Boats and Aeroplanes
- A quiz (based on *University Challenge*)
- Lectures
- D/F Competition
- Dinner in the evening (contact GW3SWL) plus all Belle Vue's facilities for the family.

Talk-in Stations on 160m and 2m from 10 a.m.

The doors will open at 11 a.m., and the official opening will be at 12 noon.

Dr. W. H. Eccles' 90th Birthday

The Society's senior Past President, Dr. William Henry Eccles, FRS recently celebrated his 90th birthday. Joining the London Wireless Club in 1913 he was present at the meeting later that year when the name was changed to Wireless Society of London. Soon afterwards he was appointed to serve on an Advisory Committee set-up to give technical advice to members and to put forward the views of the Society on various aspects of licensing.

After World War I Dr. Eccles joined forces with Senatore Marconi and Dr. (later Sir) Ambrose Fleming in supporting a plea for the early resumption of experimental activities. In January 1923 he became fourth President of the Society, succeeding A. Alan Campbell (1913–20), Dr. John Erskine Murray (1921) and Admiral Sir Henry Jackson (1922). Dr. Eccles continued in office during 1924, a period when many important events in the history of the Society were recorded. Unfortunately he suffered a severe illness during that year after which he confined his activities to those of a private consultant.

We wish him quiet contentment in his present retreat on the south coast of England.

GB2RS SCHEDULE

RSGB News Bulletins are transmitted on Sundays in accordance with the following schedule:

Frequency	Time	Location of Station
3600 kc/s	9.30 a.m.	South East England
	10 a.m.	Severn Area
	10.15 a.m.	Belfast
	10.30 a.m.	North Midlands
	11 a.m.	North West England
	11.30 a.m.	South West Scotland
	12 noon	North East Scotland
145·10 Mc/s	9.30 a.m.	Beaming north from London
	10.00 a.m.	Beaming west from London
145·8 Mc/s	10.15 a.m.	Beaming south from Belfast
145·30 Mc/s	10.30 a.m.	Beaming north west from Sutton Coldfield
	11.00 a.m.	Beaming south west from Sutton Coldfield
145·50 Mc/s	11.30 a.m.	Beaming north from Leeds
	12 noon	Beaming east from Leeds

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

Society Affairs

A Brief Report on the August 1965 meeting of the Council

THE Meeting was held on August 2, 1965, and was attended by Messrs E. W. Yeomanson (President), N. Caws, J. C. Foster, J. C. Graham, R. C. Hills, E. G. Ingram, R. H. James, A. O. Milne, L. E. Newnham, F. K. Parker, A. D. Patterson, J. F. Shepherd, R. F. Stevens, G. M. C. Stone, J. W. Swinnerton, Louis Varney (Members of Council), John. A. Rouse (General Manager and Secretary) and P. C. M. Smee (Minuting Secretary).

Apologies for absence were submitted on behalf of Mr H. A. Bartlett and Mr L. N. Goldsbrough.

Relay TV Problems

The Council received a report on a meeting between representatives of the Society and the Chief Engineer of a Wired Television Relay Company at which the Society's grave concern had been made clear regarding interference problems in Dundee, Peterborough and Crawley.

In Dundee, severe interference from the company's relay system on 80m had been suffered by a member for some years. Although a considerable amount of effort had been put into finding a cure, the interference level was still extremely high. It had been decided therefore to change the nominal frequency to just below 4 Mc/s and to complete the change-over by September 1. It was stated that all the company's systems would adopt the new frequency in due course.

The difficulties in Peterborough and Crawley arise from the susceptibility of the systems to amateur stations operating in the 3·5-3·8 Mc/s band in accordance with the terms of their licences. The company stated that a modified subscriber's terminal unit was to be introduced for use adjacent to transmitters although little hope was held out that a complete cure would be found until a new type of transistor front-end unit becomes available.

Since the meeting, the company has loaned a viewing unit to an amateur in Crawley who has succeeded in reducing the interference to negligible proportions. It remains to be seen however whether the company's application of similar measures to other installations will effect a cure.

Mullard Award 1965

It was reported that the recipients of the Mullard Award for 1965 had agreed to the presentation being made at the RSGB International Radio Communications Exhibition (an announcement regarding the award is published on page 684.—EDITOR).

Reciprocal Licensing

The Council noted the reply given by the Postmaster General in the House of Commons on July 28. (see page 540 of the August issue of the Bulletin.—EDITOR).

Recommendations of Committees

The Council accepted recommendations relating to the results of the BERU Contest 1965 (*H.F. Contests*), insurance arrangements for the RSGB International Radio Communications Exhibition (*Exhibition*), the *Daily Mail* Schoolboys and Girls Exhibition (*Education*), the award of Society trophies and premiums and London Lecture meetings (*Technical*).

Membership

The Council approved 99 applications for membership (72 Corporate and 27 Associate) and five applications from Associates for transfer to Corporate grade. The subscription of one applicant was waived on the grounds of disability.

Life membership was granted to Mr. C. R. Fry, G3NDI/VE2ARO.

Affiliation

The following were granted affiliation:

Allerton Boy Scouts Association Radio Hobbies Club.
Amateur Radio Society of Chesham and District.
Bromsgrove and District Amateur Radio Club.

Nigerian Amateur Radio Society

It was resolved to cast the Society's vote in favour of the Nigerian Amateur Radio Society's application for membership of the International Amateur Radio Union.

The G5RV Trophy

The rules governing the award of the new trophy presented by Mr. Louis Varney were approved (see page 683.—EDITOR).

The Colombo Prize

The Council agreed to put forward the names of two Society members in connection with the Colombo Prize, 1965, to the Instituto Internazionale delle Communicazioni, Genova.

Morse Records

After careful consideration, the Council decided not to adopt a suggestion by a member that the Society should produce and market a long playing Morse instructional record as the problems of storage and postal dispatch would prove very difficult.

Region 11 Meeting

Approval was given to the holding of an ORM in Colwyn Bay on September 26, 1965.

Reports of Committees

The Minutes of the meetings of the following committees were received as reports: Education (22.5.65 and 3.7.65), GPO Liaison and TVI (18.6.65), Finance and Staff (21.6.65), IARU Working Group (28.6.65), H.F. Contests (1.7.65), Exhibition (2.7.65), Technical (9.7.65), Scientific Studies (12.7.65) and RAEN (17.7.65).

* * *

The Council was in session for four and a half hours.

RSGB Slow Morse Practice Transmissions

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

Time	Call-sign	kc/s	Town
Sundays			
08.00	G3KLT	1827	Birmingham
09.30	†G3KZZ / G3TNF	1920	South Shields, Co. Durham
10.00	GW3TMH	1980	Rhyl, Flints.
10.15	G3CGD	1875	Cheltenham
10.30	GI3JEX	1860	Belfast
11.00	G2FXA	1900	Stockton-on-Tees
12.00	GM3HBY	1903	Glasgow
12.00	†G3HVI / G3OGD	1890	Stoke-on-Trent
12.00	G3SVD	1870	Reading, Berks.
12.00	G3PAI	1825	Ongar, Essex.
18.00	GW3TMP	1980	Mold, Flints.
18.30	G3NCZ	1920	Blackburn, Lancs.
19.00	G3NPB	1875	Hexham, Northumberland
21.00	†G3LKT / G3PLQ	1892	Salisbury, Wilts.
21.30	G3NQR	1875	Harrow Weald, Middx.
Mondays			
18.00	G3SWR	1980	Middlesbro', Yorks.
18.30	G3NCZ	1920	Blackburn, Lancs.
19.00	G3MXS	1875	Birkenhead
19.00	G3NPB	1875	Hexham, Northumberland
19.30	†G2ATM / G3KTP / G3OKX / G3ONB / G3RTO / G3RUB / G3RWN	1890	Heanor, Derbys.
19.30	G3SRY	1920	Cheam, Surrey
20.00	G3HJG	1980	Manchester
20.00	G3IBJ	1910	Southampton, Hants.
20.00	G3PKZ	1930	London N.22
20.15	G3SAZ	1845	Ashford, Middx.
20.30	G3TOF	1925	Harlow, Essex
20.30	G3MJS	1980	Leigh-on-Sea, Essex.
21.00	†G3IRM / G3MWO / G3PHW	1981	Bury St. Edmunds
21.00	†G3LKT / G3PLQ	1892	Salisbury, Wilts.
21.15	G3ADQ	1990	Bradford, Yorks.
21.30	†G2BSW / G3TBW	1865	Studley, Warks. Redditch, Worcs
Tuesdays			
19.00	G3NPB	1875	Hexham, Northumberland
19.00	G3NUE	144·26 Mc/s	Worcester
19.30	G3RFL	1910	Great Harwood, Lancs.
19.30	G3TAG	1970	Cambridge
19.30	G3RBP	1860	Porthcurno, Cornwall
20.00	G3RZO	1865	Redditch, Worcs.
20.00	G3PJI	1910	Southampton
20.00	G3AYJ	1925	Birmingham
20.30	G3NKX	1915	Loughton
21.00	†G3LKT / G3PLQ	1892	Salisbury, Wilts.
21.30	†G3HZG / G3TNI	1865	Redditch, Worcs. Bromsgrove, Worcs.
22.00	G3HZM	1925	Manchester
Wednesdays			
18.30	G2FXA	1900	Stockton-on-Tees
19.00	G3GBS	1865	Moseley
19.00	G3GBJ	1870	Redditch, Worcs.
19.00	GW3CJR	1930	Newbridge, Mon.
19.30	G3PTQ	1970	Cambridge
19.30	GM3SAN	1903	Glasgow
19.30	†GM3NQB / GM3UBK	3510	Thurso, Caithness

Time	Call-sign	kc/s	Town
Wednesdays			
20.00	G3RQX	1840	Wolverhampton, Staffs.
20.00	G3SAD/A	1980	Stevenage, Herts.
20.30	G3KGU	1920	Theydon Bois, Essex
20.30	G3AGN	1875	Felixstowe
21.00	†G3HVI / G3OGD	1890	Stoke-on-Trent
21.00	†G3LKT / G3PLQ	1892	Salisbury, Wilts.
21.00	G3POU / G3SFO	1850	Doncaster, Yorks.
21.00	G3RIS	1980	Cromer, Norfolk
Thursdays			
18.00	G3SWR	1980	Middlesbro', Yorks.
18.30	G3NC	1968	Swindon
18.30	G3TMI	1840	Canterbury, Kent
19.00	G3NUT	1875	Wallasey
19.00	G3NPB	1875	Hexham, Northumberland
19.30	†G2ATM / G3KTP / G3OKX / G3ONB / G3RTO / G3RUB / G3RWN	1890	Heanor, Derbys.
19.30	G3RFL	1910	Great Harwood, Lancs.
20.00	G3NHR	1900	Hounslow
20.00	G3LLM	1820	Bath, Somerset
20.00	G5XB	1878	Reading, Berks.
20.30	G3RSF	1925	Harlow, Essex
20.30	†G3KAD / G3LLZ	1850	Swindon, Wilts.
21.00	†G3IRM / G3MWO / G3PHW	1981	Bury St. Edmunds
21.00	†G3LKT / G3PLQ	1892	Salisbury, Wilts.
21.00	G3ADQ	1990	Bradford, Yorks.
21.30	†G3EVT / G3TOI	1865	Redditch, Worcs.
22.00	G3LLM	1820	Bath, Somerset
Fridays			
18.30	G3NCZ	1920	Blackburn, Lancs.
19.00	G3NPB	1875	Hexham, Northumberland
19.30	†GM3NQB / GM3UBK	3510	Thurso, Caithness
19.30	G3PWU	1850	Reading, Berks.
20.15	G3DXA	1845	Ashford, Middx.
20.30	G3TXI	1925	Nazing, Essex
21.00	†G3LKT / G3PLQ	1892	Salisbury, Wilts.
21.00	G3PKE	1920	Dorking, Surrey
21.00	G3RIS	1980	Cromer, Norfolk
21.30	†G3RZI / G3TQD	1865	Redditch, Worcs. Droitwich, Worcs.
21.30	†G3UCZ / G3KSS	1900	Pudsey, Yorks. Bradford
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
14.00	GI3JEX	1860	Belfast
14.00	G3SVD	1870	Reading, Berks.
15.30	G3RFL	1910	Great Harwood, Lancs.
18.00	GW3TMP	1980	Mold, Flints.
19.00	G3NPB	1875	Hexham, Northumberland
20.00	G3KPO	1980	Peterborough
20.30	G3TLJ	1925	Roydon, Essex
21.00	†G3LKT / G3PLQ	1892	Salisbury, Wilts.

†*Alternately*

Reports from listeners to these transmissions will be welcomed by the operators concerned.

CLUBROOM

A Monthly Survey of Group and Club Activities

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

Bedford and District ARC has vacated its old premises and is hoping to start meeting shortly at the Westfield School, Queens Park. Members will be notified of the dates of meetings in due course. New members, especially from outlying areas, will be particularly welcome. (*G3OWQ*)

Bradford RC will be holding meetings on October 12 and 26. At the former the members will be visiting Police HQ—of their own free will and accord—while at the latter meeting, G3TDZ will be talking about " Transistors in the Shack." (*G3SAO*)

Bromsgrove and District ARC will be holding the monthly meeting on October 8 commencing at 8 p.m. The Morse classes continue to be well supported, while at the local college, an RAE course got under way in September. Details of the complete winter programme are available from G2LCN.

British AT Club's latest issue of *CQ TV* contains a simple but effective solid-state signal probe for use in the aerial feed line, and while nominally of interest to TV addicts, this useful little device could be a boon to any 70cm natural natterer.

Bury and Rossendale RS are meeting at the Old Boars Head, The Rock, Bury on October 12, when, ale being well, they hope for some voluble discussion on Field Day results, and a Constructional Competition. (*G3RHR*)

Cambridge ARC decided to continue meetings during August, and the experiment proved to be very worthwhile. Their Honorary Secretary G3GGJ is back in action after a spell in hospital, and at very short notice, organized a station to take part in the V.H.F. contest. A full programme has been planned up to Christmas, details of which may be secured from G3GGJ.

Chelmsford ARS thought that its D/F hunt was going quite well, as indeed it was, until the Clerk of the Weather took a hand. Only grim determination persuaded G3PMX, soaked by torrential rain, and dripping water at every pore, to keep the hidden transmitter operating until several competitors had located him. (*G3EIX*)

Chesham and District ARS meets each Friday at 8 p.m. and offers a hearty welcome to prospective members and visitors alike. At the moment the club is operational on Top Band, but plans are in hand to extend on the air activities to other bands. Full details of activities may be obtained from G3CLJ.

Cornish ARC's publication under review *Cornish Link* contains a high proportion of information on v.h.f. activity from which it seems that the activity on these frequencies in the Duchy is of a very high order, higher indeed than in some of the more densely populated areas. There must be a lesson to be learnt here somewhere. (*G3OCB*)

Crawley ARC, during the early part of September, operated G8RW/P and G3FRV/P in the V.H.F. NFD. At least one member will remember this event as he got his car stuck in deep mud. G3TIR came to the rescue with a horsebox—which just happened to be handy. In a recent Newsletter, Don, G3TIR, hits the news through having been in his shack when his aerial system was hit by lightning. Fortunately he escaped, but some of the equipment suffered in a bad way. As a result of his experience, Don is inclined to the view that a spark-gap outside the premises as suggested in the RSGB *Handbook* is better than internal earthing of the equipment. (*G3TTC*).

Cray Valley RS is holding an informal Dinner/Dance at the Bull's Head Hotel, Chislehurst on November 19 and it is hoped that many of the club's friends will be able to attend. (*G3KYV*)

Crystal Palace and District RC had a talk on September 18 on S.H.F. by G3SYY. The club committee has decided that the club should have its own call-sign, and application is being made to the GPO accordingly. The club feels quite satisfied with its performance in the 4m Portable Contest as well they should for G2VB/P worked some 75 stations which gave a total score of over 5,000 points. (*G3FZL*)

Derby and District ARS has provided us with a very impressive list of prize winners at the Mobile Rally Draw. Not only is the list a long one, but more than this, it contains items of considerable substance such as an Automatic Electric Washer, Radio Camera, Electric Cooker and a transistor radio to mention but a few. We hope that the Programme Prize, won by G3PDS, and which was a Blue Stilton Cheese—size unspecified—did not have to walk home. (*G2CVV*)

Echelford ARS had four entrants for the RAE, all of whom met with success. They, along with two previous winners are now hard at mastering the Morse Code. The newsletter under reveiw comments on an increasing interest in the 4m band. In another section, an s.w.l. who has been busy building his own receiver passes some pertinent observations on the gentle art, the most important of which is probably the observation that it pays to secure new coupling and decoupling condensers for any project. He has our sympathy, for we learnt the hard way too. (*G3RHF*)

FCOC announce the winner of the FOC Marathon Contest for 1965 as GW3OAY. (*G3JLB*)

Guildford and District RS has meetings planned for October 8 and 22, the first of which is the RSGB Tape Lecture " TX design and TVI," an item which should prove of interest to all members. (*G3KMO*)

Harlow and District Radio Society received great local publicity when it operated its exhibition stations with the call-sign GB3HRS, and provided a generous display of members' equipment at " Harlow Day " on August 28 and 29. This event was promoted on a gigantic scale by the Local Council of Harlow New Town.

Over 25,000 attended and many thousands were attracted to the Society's marquee by closed circuit television, ably laid on by members of the British Amateur Television Club. Roding Boys' Society, who camped on the site during the period of the show, under their redoubtable leader, Ken Smith, G3JIX, attracted great attention too.

Many visiting people of standing showed great interest in the " gear " on show and the society's activities, but none more than the Mayor of the London Borough of Barking, W. E. Bellamy, J.P.—a keen short wave listener—who returned later on the Saturday for further informal discussions.

Irish Radio Transmitter's Society is holding its annual event, *The Dinner*, on October 23 at the South County Hotel, preceded by a tour of the Montrose TV Studios at 2.30 p.m. Very early booking is strongly advised, and application should be made to the Secretary of the Society. Four Metre activity in the Cork City area is on the up and up, while insofar as 2m is concerned, there is a suggestion that a beacon station should be erected. (*EI6AS*)

Luton ARC is actively preparing a new programme for meetings up to Christmas. This will include a monthly feature of a constructional evening when it is hoped to encourage home brew, and at the same time provide an opportunity for the interchange of ideas, plus facilities for sorting out the more elusive snags. (*G3TUI*)

Magnus Grammar School RS is pleased to report that it had four successes in the recent RAE. Recently a visit to an RAF station proved to be full of interest. (*G3PAW*)

Mid-Warwickshire ARS will participate in the Jamboree-on-the-air on Saturday and Sunday, October 16 and 17. In addition regular meetings will be held on October 4 and 18, the former being a lecture on Workshop Practice, and the latter devoted to a junk sale.

Manchester College of Science and Technology RS is planning its programme for the coming year, and so far, has three main events organized. First they will have a stall at the Freshers week. Secondly, on October 15, John Clarricoats, G6CL, will lecture on International Amateur Radio, while on November 16, G3LLJ will talk on Parametric Amplifiers. (*G3CXX*)

Midland ARS seems to have lost their Vic Desmond Trophy and have issued an appeal for information as to its whereabouts. Do you know? Trophies are usually quite irreplaceable, and any right thinking person will appreciate their concern. Once clear of the AGM, the Society will be looking forward to another year of progress. (*G3JDJ*)

Newark SWC seeks to enlist the help of another club, or Society member. They would like to have the loan of any 8mm film made concerning NFD activities. The greatest care will be

taken of any film offered. If you can come to the rescue will you contact G. Francis, 93, Balderton Gate, Newark.

North Kent RS has been glad to welcome a number of new call-signs to its membership. As they observe, this not only adds to the strength of the club, but more than this, gives the s.w.l. members incentive to strive for their own tickets. The club's Top Band Net continues to flourish. (*G3PUI*)

Northern Heights ARS report that some recent activities have included a trip to the Atomic Power Station in Cumberland, and a demonstration station at the Halifax Agricultural Show. On October 26 members are visiting Baird Television at Bradford, and on the 30th a party will be making their presence felt at the Radio Communications Exhibition in London. (*G3MDW*)

Oxford University RS has a very full programme planned for October and November with meetings planned for each week. The Secretary would be pleased to hear from any amateur or s.w.l. going up to Oxford this year. (*G3RKK*)

Purley and District RC will be holding meetings as usual on the first and third Fridays in each month. The first meeting in October and November will be informal, with c.w. practice, and the Club station on the air. On October 15, they will be holding an ever popular Junk Sale. (*G3FTQ*)

Radio Amateur Invalid Club. From the August issue of Radial, we note that Bruce, G3IES has made a number of modifications to his KW2000 which have resulted in producing full a.m. facilities both for transmit and receive. The details of these modifications are available to anyone *provided* that they are accompanied by a donation to the RAIBC. To Bruce we offer congratulations on two counts, (i) on achieving satisfactory compatibility a.m./s.s.b. with the KW2000, and (ii) on a very worthy idea to raise funds for the RAIBC (*G3LWY*)

Reading ARC reports that its new clubroom at St Paul's Hall is beginning to take shape and it is hoped that the club station will be operating shortly. Meetings are held twice monthly, on Tuesdays. Prospective new members are always welcome. (*G3TOQ*)

Roding Boys' Society. The weekend at Ollerton, where 'JIX gave a talk on the club's work, was most successful. The London Federation of Boys' Clubs Hindeap Camp Station (GB3FED) was another project during the last month. All RBS members hope to meet old friends at the Radio Communications Exhibition and the stand will be in its usual place.

South London Mobile Club has provisionally arranged a weekend camp for October 8. Enquiries to G3SBT.

South Birmingham RS will be holding its AGM in October and looks forward to a good attendance. On this occasion it is hoped to make an announcement concerning a new permanent QTH which will have facilities for setting up a club station. (*G3TQO*)

South Dorset RS had a talk by G3EAT on basic receivers at its September meeting, and this was followed with matters relating to the final arrangements for V.H.F. NFD.

South Shields and District ARC holds its weekly meetings on Fridays at the Trinity House Social Centre commencing at 7.45 p.m. The clubs AGM was held early in September, and with that hurdle cleared it is looking forward to another year of progress. (*G3KZZ*)

Saltash and District ARC has meetings arranged for October 8 and 22. Programmes for the coming Autumn and Winter months are well advanced with talks, lectures, and films on the schedule. (*G2DFH*)

Scout Amateur Radio Group. The club station G3TGS is now installed in Baden-Powell House, and is on the air each Tuesday and Saturday evening using a KW2000. Even bare foot the station is doing well, and in time it is hoped to add a linear. (*G3FXC*)

Southgate and Finchley Group has meetings on October 3 and 14. The former will be a second Mobile Treasure Hunt, and this promises to be just as enjoyable as the previous. (*G3TDM*)

Spalding and District ARS is deep in thoughts of how to raise the wind with the object of making all-round improvements. A junk sale is on the cards as one of the measures. In the spring, when all good operators thoughts turn to rallies, there is talk of organizing a Mobile Rally. New and prospective members are always welcome. (*G3TRO*)

Stockport RS has its Winter programme arranged which, besides including the usual technical subjects has been expanded to include some social activities. On October 30 members are joining forces with Granada ARC for a Halloween Party. (*G3MBQ*)

Stratford-upon-Avon RC. Each year the club has a Gala lecture given by an expert on a chosen topic. This year the lecture is to be given by G5PP on October 15 on Mobile Radio at the Union Club, Chapel Lane, Stratford, starting at 8 p.m. (*G8TQ*)

Surrey Radio Contact Club, while having a large membership is going through a phase of apathyitis with attendances at meetings below that which could be reasonably expected. For some odd reason, this seems to hit all clubs from time to time. (*G3KGA*)

Swindon and District ARC reports that its membership is steadily increasing, but like all clubs, would still welcome application from those who " do not belong." If sufficient support is forthcoming, it is hoped to organize a coach from Swindon to the Communications Exhibition at the end of October. (*G3LLZ*)

Torbay ARS is really bucked at receiving a QSL card from YO1FB for its only contact outside GB during NFD, and this on 160m into the bargain. Which only goes to show. (*G3LKJ*)

Uxbridge RS is holding meetings on October 4 and 11. Special notice to BAM addicts. December 13 is the red letter day. All lovers of BAM must not miss this. For the uninitiated BAM are the code letters for Bangers and Mash.

Verulam ARC really had a go in V.H.F. NFD with two stations on 2m, one on 4m and the other on 70cm/s. To create interest all operators were invited to participate, and by using 'phone, the s.w.l's found plenty to hold their attention. (*G3PAO*)

Wimbledon and District RS recently enjoyed a lecture by G2MI on " QSL Cards." Equally interesting was a talk by G6QN on Wavemeters. Even through membership stands at over fifty, a hearty welcome awaits others who wish to join the merry throng. (*G3EPU*)

HELP US TO HELP YOU

This feature can materially assist your membership, and when sending contributions the general rule should be to provide too much information rather than too little. In addition, due to pressure on space, as it is not possible to print the full name and address of club secretaries, will you please ensure that a call-sign is included to whom interested persons can apply. Without such a call-sign the club item can lose a great deal of its potential value.

The deadline for the **December** issue will be **November 5.**

RSGB
MOBILE SAFETY RECOMMENDATIONS

1. All equipment should be so constructed and installed that in the event of accident or sudden braking it cannot injure the occupants of the car.
2. Mobile aerials should be soundly constructed, taking into account flexing at speed and possible danger to other vehicles or pedestrians. The maximum height must not exceed 14 ft. above ground.
3. Wiring should not constitute a hazard, either electrical or mechanical, to driver or passengers.
4. All equipment should be adequately fused and a battery isolation switch is desirable.
5. The transmit/receive switch should be within easy access of the operator and one changeover switch should perform all functions.
6. The microphone should be attached to the vehicle so that it does not impair the vision or movement of the driver.
7. A driver/operator should not use a hand microphone or double headphone.
8. All major adjustments, e.g. band change by a driver/operator, should be carried out whilst the vehicle is stationary.
9. Essential equipment controls should be adequately illuminated during the hours of darkness.
10. Logging must not be attempted by the driver whilst the vehicle is in motion.
11. All equipment must be switched off when fuelling and when in close proximity to petrol tanks.
12. A suitable fire extinguisher should be carried and be readily accessible.

Forthcoming Events

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

LOOKING AHEAD

October 10.—Northern Radio Societies Convention, Belle Vue.

October 16-17.—Eighth Jamboree-on-the-Air.

October 27-30.—RSGB International Radio Communications Exhibition.

December 17.—RSGB Annual General Meeting.

REGION 1

Ainsdale (ARS).—October 13 (Film Show at G3FXI), October 27 ("Signal Generators/Frequency Meters"), 8 p.m., 77 Clifton Road, Southport.

Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.

Blackpool (B & FARS).—October 11 (Evening Meal at Stuart Hotel), October 18 (Open Evening), October 25 (Talk and Demonstration, "My Latest Receiver", by H. Fenton, G8GG), November 1 (Open Evening), 8 p.m., Pontins Holiday Camp, Squires Gate. Morse tuition from 7.30 p.m.

Bury (B & RRS).—October 12 (Field Day Results and Constructional Competition), 8 p.m., Old Boars Head (private room), Crompton Street.

Chester.—Tuesdays, 8 p.m., YMCA, except first Tuesday in each month.

Crewe & District.—November 1, 8 p.m., Earl of Crewe Hotel, Nantwich Road.

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

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

Macclesfield.—October 12 and 26, the George Hotel, Jordongate.

Manchester (M & DARS).—Wednesdays, 7.30 p.m., 203 Droylsden Road, Newton Heath, Manchester 10.
(SMRC).—Fridays, 7.45 p.m., Rackhouse Community Centre, Daine Avenue, Northenden.

Morecambe.—October 6, November 3, 125 Regent Road.

Preston.—October 12 (Junk Sale), October 26 (Visit to Inskip Naval Station—please advise Secretary before October 12).

Southport (SRS).—Wednesdays, 8.30 p.m., Sea Cadets Camp, The Esplanade.

Stockport.—October 6, 20 and November 3, The Blossoms Hotel, Buxton Road, Stockport.

Wirral.—October 6, 20, Harding House, Park Road West, Claughton, Birkenhead.

REGION 2

Catterick.—Tuesday & Thursday, 7.30 p.m., Clubroom, Vimy Road.

Durham.—Every other Thursday, 8 p.m., Bridge Hotel, North Road, Durham.

Northern Heights.—October 13 (Setting up Scout Jamboree Station), October 16, 17 Jamboree-on-the-Air), October 27 (Visit to Baird Television Works, Bradford), October 30 (Visit to Radio Communication Exhibition, London).

Scarborough.—Thursdays, 7.30 p.m., rear of 3 Trinity Road.

Spen Valley.—October 7 ("Morse Code" by G2FIS), October 14 (The Mast at Emley Moor), October 21 ("Starting on 2m", by G3NAO), October 28 ("Radio Astronomy for the Amateur", by Mr L. M. Dougherty), 7.30 p.m., Heckmondwike Grammar School.

REGION 3

Birmingham (Slade).—October 15, 7.30 p.m., The Church House, Erdington.
(South).—October 21 (AGM), 7.30 p.m., Friends Meeting House, Moseley Road, Birmingham.

Cannock (CCARS).—October 9 (AGM), October 21, 8 p.m., The Bridgtown Social Club, Walsall Road, Cannock.

Coventry (CARS).—Mondays, 8p.m., TA Centre, Westfield Road, Coventry.

Dudley (ARS).—Fridays, 8 p.m., Art Gallery, Dudley.

Mid. Warwickshire (MWARS).—Friday, 7.30 p.m., 7 Regent Grove, Leamington Spa.

Redditch (EWARG).—October 14, November 11, 8 p.m., Redditch Old People's Centre, Park Road, Redditch.

Salop (SARS).—October 14, 7.30 p.m., Morris Hall, Bellstone, Shrewsbury.

Stratford-upon-Avon (ARS).—Fridays, 7.30 p.m., Masons Arms, Sanctus Road, Stratford-upon-Avon.

Stourbridge & District (S & DARS).—October 22 (Annual Dinner), Bell Hotel, Stourbridge.

REGION 4

Burton on Trent (BTARS).—November 24 (Annual Dinner), Midland Hotel, Burton-on-Trent. Tickets 14s each.

Derby (D & DARS).—October 6 (Surplus Sale), October 13 (Sub-Basement Clean-up), October 20 (Social Evening—Ilkeston), October 27 (Quiz Competition), October 30 (Annual Trip to London), November 3 (Surplus Sale), 7.30 p.m., Room No. 4, 119 Green Lane, Derby.

Heanor (H & DARS).—October 12 (Film Show), October 19 (RTTY, by S. Hine, G3RUB and A. Woodruff, G3OVZ), October 26 (Transmitting Evening), 7.30 p.m., Heanor Technical College, Ilkeston Road, Heanor.

Leicester (LRS).—Mondays, 7.30 p.m., Sundays 10.30 a.m., Club Room, Old Hall Farm, Braunstone Lane, Leicester.

Loughborough (LARC).—October 8 (Tape Recorded Lecture "Radio over the years", October 15 (Jamboree-on-the-Air, Kegworth Scout Hut), October 22 (Film Show), October 29 ("DXpedition to Drum Mountain", by D. H. Watson, G3PXP), October 30 (Trip to London Exhibition), 7.45 p.m., Club Room, Bleach Yard, Wards End, Loughborough.

Mansfield (MRS).—Fridays, 7.30 p.m., The New Inn, Westgate, Mansfield.

Melton Mowbray (ARS).—October 21, 7.30 p.m., St. John Ambulance Hall, Asfordby Hill, Melton Mowbray.

Newark (Magnus GS).—3.50 p.m. Junior Physics Lab, Magnus Grammar School, Newark.

Nottingham (ARCN).—Tuesdays, Thursdays, Room 3, Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham.

Peterborough (P & DARS).—Fridays, 8 p.m., The Old Windmill Clubhouse, London Road, Peterborough.

Worksop (NNARS).—Tuesdays (RAE class), Thursdays (Lecture), 7.30 p.m., Club Room, 13 Gateford Road, Worksop.

REGION 5

Cambridge (C & DARC).—October 8 ("On Socotra", by VS9SJF), October 15 (Re-organization of Club Station), October 16-17 (Scout Jamboree-of-the-Air), October 22 (Natter Evening), October 29 ("Transparency Evening," arranged by F. A. E. Porter and Peter Long). Fridays, 7.30 p.m., Club Headquarters, Corporation Yard, Victoria Road, Cambridge.

Cambridge University (CUWS).—Tuesdays, 8.15 p.m., Psychology Department, Downing Site, during University term.

Luton (L & DARS).—Tuesdays, 8 p.m., ATC Headquarters, Crescent Road, Luton, Bedfordshire.

Royston (R & DARC).—Wednesdays, 8 p.m., Manor House Social Club, Melbourn Street, Royston, Herts.

Shefford (S & DARS).—October 7 (Lecture by C. Brown), October 14 (Lecturer from Texas Instruments), October 21 (Open Discussion), October 28 (Mullard Film Show), 7.45 p.m., Church Hall, High Street, Shefford, Bedfordshire.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street, Cheltenham.

REGION 7

Acton, Brentford & Chiswick (ABCRC).—October 19 (Members Holiday Slides), 7.30 p.m., AEU Club, 66 High Road, Chiswick.

Ashford (Middx.) Echelford ARS.—October 13, 27, 7.30 p.m., Links Hotel, Ashford.

Bexley Heath (NKRS).—October 14, 28, 7.30 p.m., Congregational Hall, Chapel Road, Bexley Heath.

Chingford (Group).—October 15, Contact the Secretary, Loughton 2397.
(SRC).—Fridays (except first), 8 p.m., Friday Hill House, Simmons Lane.

Croydon (SRCC).—October 12, 7.30 p.m., Blacksmiths Arms, 1 South End.

Dorking (D & DRS).—October 12 (Clubnight), October 26 (Junk Sale), 8 p.m., Wheatsheaf, Dorking.

East Ham.—Tuesdays fortnightly, 7.30 p.m., 12 Leigh High Road, East Ham.

East Molesey (TVARTS).—First Wednesday each month, Prince of Wales, Bridge Road, East Molesey.

Edgware & Hendon (EADRS).—October 11, 25 8 p.m., John Keble Hall, Church Close, Deans Lane, Edgware.

Enfield.—October 19, 8 p.m., George Spicer School, Southbury Road.

Harlow (DRS).—Tuesdays and Thursdays, 7.30 p.m. Mark Hall Barn, First Avenue.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the White Hall Hotel, Bloomsbury Square, London, W.C.1

at 12.30 p.m. on Fridays, October 15 and November 19, 1965.

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

Harrow (RSH).—October 8 (Planning Night), October 15 ("Aerials," by G6CJ), October 22, (Practical Night), October 29, (Junk Sale), 8 p.m., Roxeth Manor County School, Eastcote Lane, Harrow.

Holloway (GRS).—Mondays and Wednesdays, 7 p.m., (RAE and Morse), Fridays 7.30 p.m. (Club), Montem School, N.7.

Hounslow (HADRS).—October 18, Canteen, Mogden Main Drainage Department, Mogden Works, Isleworth.

Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (Nr. Seven Kings Station).

Kingston.—October 7 (Surplus Gear Sale), October 21 (AGM), 8 p.m., YMCA, Eden Street, Fridays (Morse classes), 2 Sunray Avenue, Tolworth.

Leyton & Walthamstow.—7.30 p.m., Leyton Senior Institute, Essex Road, London, E.10. (Ring G3RYF first—Ilford 3020, Extn. 247).

London U.H.F. Group.—October 7 ("Semiconductors", Demonstrations and talk), 7.30 p.m., Bull & Mouth, Bloomsbury Way, Holborn.

London Members Luncheon Club.—12.30 p.m., Third Friday every month (see separate advertisement).

Loughton.—First Thursday every month, 7.30 p.m., Loughton Hall (near Dedben Station).

New Cross (CARS).—Wednesdays and Fridays, 8 p.m., 225 New Cross Road, London, S.E.14.

Norwood & South London (CP & DRS).—October 16 (Hi-Fi Evening), CD Training Centre, Bromley Road, Catford, S.E.6.

Paddington (P & DARS).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2a Warwick Crescent, W.2.

Purley (P & DRC).—October 15 (Junk Sale), November 5 (C.W. and Informal), 8 p.m., Railwaymen's Hall (side entrance), Whytecliffe Road.

Reigate (RATS).—October 16 (Club Night), 7.30 p.m., George & Dragon, Cromwell Road, Redhill.

Romford (R & DRS).—Tuesdays, 8.15 p.m., RAFTA House, 18 Carlton Road.

Scout ARS.—October 21, 7.15 p.m., Baden Powell House, Queens Gate, South Kensington.

Science Museum (CSRS).—October 19 ("Tape recording's by W. A. Scarr, G2WS), 6.30 p.m., Science Museum, South Kensington.

Sidcup (CVRS).—October 7, November 2, ("Radio & TV Interference Problems," by S. W. Smith, GPO), 7.30 p.m., Congregational Church Hall, Court Road, Eltham).

Slough (SARS).—First Wednesday every month, 8 p.m., United Services Club, Wellington Street.

Southgate & District.—October 14 ("Moon Bounce" by G3LTF), 7.30 p.m., note at Parkwood Girls School behindWood Green Town Hall.

St. Albans (Verulam ARC).—October 20 ("The RSGB and You," 8 p.m., Marconi Service Works, Hedley Road.

Uxbridge.—October 18, 8 p.m., St. Andrews Scout Hut.

Welwyn Garden City.—October 14 ("The Approach to 23cm," by Arnold Mynett, G3HBW), 8 p.m., The Blackhorse Room, Handside Lane.

Wimbledon (W & DRS).—October 8, 8 p.m., Community Centre, St. George's Road, Wimbledon, S.W.19.

Wembley GEC ARS.—October 8, visitors may telephone ARNold 1262 before the meetings for further information.

REGION 8

Crawley (CARC).—October 13, 8 p.m., Trinity Congregational Church, Ifield. October 27 (Informal—Visit to Radio Communications Exhibition).

REGION 9

Bath.—October 15, 7.30 p.m., RNR Training Centre, James Street West, Bath.

Bristol.—October 22, 7.15 p.m., Small Physics Theatre, Royal Fort, Bristol University,Woodland Road, Bristol 8.

Burnham-on-Sea (B-o-SARS).—Second Tuesday in each month, 8 p.m., Crown Hotel, Oxford Street, Burnham-on-Sea.

Camborne (CRAC).—First Thursday in each month, Staff Recreation Hall, SWEB Headquarters, Pool, near Camborne.

Exeter.—First Tuesday in each month, 7.30 p.m., George and Dragon Inn, Blackboy Road, Exeter.

Plymouth (PRC).—Tuesdays, 7.30 p.m., Virginia House, Bretonside, Plymouth.

Saltash (SADARC).—Alternate Fridays, 7.30 p.m., Burraton Toc H Hall, Warraton Road, Saltash.

South Dorset (SDRS).—First Friday in each month, 7.30 p.m., Labour Rooms, West Walks, Dorchester.

Torquay (TARS).—October 30 (Film Show), Club HQ, Belgrave Road, Torquay.

Weston-super-Mare.—First Friday in each month, 7.15 p.m., Victoria Hotel, Weston-super-Mare.

Yeovil (YARC).—Wednesdays, 7.30 p.m., Park Lodge, The Park, Yeovil.

REGION 10

Cardiff.—October 11 (Talk on "Eddystone receivers," by Mr. Walker, G5JU), 7.30 p.m., TA Centre, Park Street, Cardiff.

REGION 11

Bangor (UCNWARS).—October 14 ("V.H.F. Techniques," by J. T. Lawrence, GW3JGA), 5.30 p.m., Dept. of Electronic Engineering, UCNW, Dean Street, Bangor.

Llandudno (CVARC).—October 14 ("Radio Astronomy," by Mr R. Doylerush F.R.A.S.), 7.30 p.m., Cross Keys, Madoc Street, Llandudno.

Prestatyn (FRS).—October 27 (Junk Sale and Auction), 8 p.m., Railway Hotel, Prestatyn.

REGION 13

Edinburgh (LRS).—October 14 ("V.H.F," by J. F. Shepherd, GM3EGW), October 28 (Films), 7.30 YMCA, South St. Andrew Street, Edinburgh.

REGION 14

Glasgow.—First and Third Wednesdays in each month, Christian Institute, 70 Bothwell Street, Glasgow, C.2.

REGION 16

Basildon (BDARS).—Details of meetings from G3IGB.

Great Yarmouth (GYRC).—Fridays, 7.30 p.m., the Manager's Office, the Old Power Station, South Quay, Swanston's Road, Great Yarmouth, Details from G3HPR.

Ipswich (IRC).—Last Wednesday in each month, 7.30 p.m., Civic College, Ipswich. Details from J. Rhind, Ipswich 42504.

Norwich (NARC).—Mondays, 7.30 p.m., the Club Centre, 140 Oak Street, Norwich. Details from G3TLC.

Southend (SDARS).—Meetings in the Executives Canteen, E. K. Cole Ltd., Priory Crescent, Southend-on-Sea. Details from G3NPF.

Contest News (continued from page 679)

CQ World Wide DX Contest 1965

The following is a résumé of the rules for this year's World Wide DX contest arranged by *CQ Magazine*.

Period: phone section: 00.00 GMT October 23 to 24.00 GMT October 24. **C.w. section:** 00.00 GMT November 27 to 24.00 GMT November 28.
Bands to be used: 1·8 to 28 Mc/s.
Type of competition: (a) Single operator (i) all band (ii) single band; (b) Multi-operator single transmitter; (c) Multi-operator multi transmitter.
Inter-Club (Local DX Clubs).
Serial numbers: Phone stations will exchange serial numbers consisting of 4 numerals, the first 2 being the RS report and the last 2 their own Zone number. C.w. stations will exchange serial numbers consisting of 5 numerals, the first 3 being the RST report and the last 2 their own Zone number. Stations in Zones 1 to 9 will prefix their Zone number with 0.
Points: Contacts between stations on different continents will count 3 points. Contacts between stations on the same continent but not in the same country will count 1 point. Contacts between stations in the same country will be permitted for the purpose of obtaining a Zone and/or Country multiplier but no QSO points can be claimed. Only one contact with the same station is permitted per band. A multiplier of 1 for each Zone contacted on each band and a multiplier of 1 for each country worked on each band.
Scoring: The score of each single band is the sum of the Zone and country multipliers for that band, multiplied by the total contact points on that band. The total all band score is the sum of the Zone and country multipliers of all bands multiplied by the sum of the contact points on all bands.

Those sending in logs for a single band are eligible for a single band award only. If a log is sent in for more than one band, indicate which band is to be judged otherwise it will be judged as an all band entry. Single operator contestants must show a minimum of 12 hours operating time to be eligible for an award. If a contestant operates more than one band and wishes to be judged for a specific single band he must show a minimum of 12 hours on that band. Contestants using the 21 or 28 Mc/s bands will be required to show a minimum of only 8 hours. Multi-operator stations must show a minimum of 24 hours of operating time to be eligible for an award, and will be judged only on the basis of an all band score.

The log forms and report forms follow the pattern of previous years. Zone numbers and countries should be filled in on only the first occasion of a contact. All times to be in GMT. All logs must be postmarked not later than **December 1, 1965,** for the **phone** section and **January 15, 1966,** for the c.w. section, and should be sent to *CQ*, 14 Vanderventer Avenue, Port Washington, L.I., N.Y. 11050, USA (Attention Contest Committee), marking the envelope *c.w.* or *phone*.

Fourth 70 Mc/s Contest (C.W.) 1965

The only change in the rules for this contest from those of last year is the inclusion of a section for multiple operator stations. It is hoped that the great increase in activity on this band will result in a large number of entries.

Check logs from listeners are invited and may be credited towards the V.H.F. Listeners' Championship. Any comments on the rules will be welcome and will be considered when the rules for the next similar contest are made.

1. **When:** 10.00 GMT to 22.00 GMT on Sunday, December 5, 1965.

2. **The General Rules** of RSGB contests as published in the January, 1965 issue of the RSGB BULLETIN will apply except as superseded by the rules of this contest.

3. **Eligible Entrants:** All operators must be fully paid-up members of the RSGB resident in Europe and hold a current Amateur (Sound) Licence. Multiple operator entries will be accepted provided that only one call-sign is used.

4. **Sections (A)** Single operators receiving no assistance during the contest and operating from home.
(B) other stations.

5. **Contacts** may be made on any mode permitted in the Amateur (Sound) Licence except A2 (m.c.w.).

6. **Scoring** will be on the basis of one point per mile.

7. **Contest Exchanges:** RST or RS reports followed by the contact number and location (e.g. RST 599001, 4 north Macclesfield, Cheshire). This location must be identifiable without ambiguity on the Ordnance Survey "Ten-mile" map. It is the responsibility of the receiving operator to obtain the information necessary to calculate his distances correctly.

8. **Entries:** (a) Logs should be tabulated in columns headed in this order: "Date/Time (GMT)"; "Call-sign of station contacted"; "My report on his signal and serial number sent"; "His report on my signal and serial number received"; "Location of station received"; "Call-sign of operator" (Multi-operator entries only); "Points claimed".
(b) The cover sheet must be made out in accordance with General Rule 4 and the declaration signed. Multi-operator entries should be so marked and the operators listed. The section for which entry is being made must be shown. The QTH as sent and the NGR full six-figure reference should be recorded. Stations outside the area of the National Grid should show latitude and longitude.
(c) Entries must be postmarked not later than Wednesday, December 29, 1965.

10. **Awards:** At the discretion of Council certificates of merit will be awarded to the winner, the runner-up and the non-transmitting member submitting the best check log.

ORDER FORM

Quantity	TITLE	£	s.	d.
	RSGB PUBLICATIONS			
	The Amateur Radio Handbook (3rd Ed.), price 36/6			
	Radio Data Reference Book, price 14/-			
	Amateur Radio Circuits Book, price 8/6			
	Radio Amateurs' Examination Manual (3rd Ed.), price 5/9			
	A Guide to Amateur Radio (11th Ed.), 5/7			
	Service Valve Equivalents (5th Ed.), price 3/6			
	S.S.B. Equipment, price 3/-			
	Communication Receivers (2nd Ed.), price 3/-			
	The Morse Code for Radio Amateurs (3rd Ed.), price 2/-			
	AMERICAN PUBLICATIONS			
	Radio Amateurs' Handbook (ARRL 1965 Ed.) price 42/6			
	Single Sideband for the Amateur ARRL, price 25/-			
	New Sideband Handbook, CQ, price 24/-			
	Antenna Book ARRL (10th Ed.), price 18/6.....			
	Radio Amateurs' V.H.F. Manual, price 18/6			
	Understanding Amateur Radio, ARRL, price 18/6			
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The Month on the Air

(Continued from page 670)

II1KDB will be on s.s.b. October 16/17 and 23/24 from Ischia Island with the call **IE1KDB.**

4W2AA expects to be signing **FL8ET** for a few days during October.

VK0TO (Macquarie Island) active on 14,170 at 05.30, a.m., but copies s.s.b.

EL2AM (WA4THC) is due in Nepal in about two months time and hopes to obtain an 9N1 licence.

HK0AI, San Andres Island usually can be found on 14,015 kc/s at 21.30 during weekends.

The latest rumour on Gus, W4BPD, is that after a spell at **OY2GHK** (first week of October), he will proceed to **YK** and **YI.**

CQ Contest log sheets may be obtained from G3HDA by sending a large s.a.e.

9J2GJ is active every day between 11.00 and 12.00 on 28 Mc/s c.w.

FB8WW is active at weekends on 21,215 kc/s a.m. around 13.30.

PY7ACQ will shortly be active from Fernando De Noronha Island.

ZD9BC, Gough Island, is expecting to receive s.s.b. equipment in the near future.

Don Miller was due to show up from **K7LMU/HS** around October 1, after which, according to which rumour you prefer, he was due to activate VK0, Heard Island, or Paracel Island (112° E, 18° N) and Spratley (113° E, 8° N).

* * *

Correspondents are thanked for their co-operation and acknowledgement is made to the *West Gulf DX Club Bulletin* (W5IEJ), the *LIDXA Bulletin* (W2FGD/W2MES), *DX'press* (PA0FX) and *The DX'er* (N. Californian DX Club). Please send all items to RSGB Headquarters to arrive not later than **October 8** for the **November** issue and **November 11** for the **December** issue.

Four Metres and Down

(Continued from page 674)

DL6IQ, G3LTF, G3CCH, LX1SI, HB9RG, OZ8EME, PL1PL, SM7OSC, SM6CSO and VE2LI.

The following were heard and recorded on tape: G3EGV, W1CTW, SM6PU, GM3FYB, VE3BPR/1, G3DMZ, PA0KJ, W4UWH, K2LZF, W3VSB/1, K6LMZ/6, W0IDY, K3BHY, W1NZP, W6FZA.

(from *QST*, September 1965)

There was also at least one contact by moonbounce between WA6LET (Stanford Radio Club, Calif.) with a 150 ft. dish and K2MWA/2 (Crawford Hill V.H.F. Club), with a 60 ft. parabola. WA6LET was also heard in the US calling DJ0LO and sending an S2 report. K2MWA/2, in addition to working both KP4BPZ and WA6LET on both c.w. and n.b.f.m., also identified moonbounce signals from W1BU and W3SDZ.

(from *QST*, September 1965)

On Saturday, September 25, **G3LTF** successfully worked **WA6LET** in California by moonbounce.

Amateur Licences

At August 31, 1965, the number of amateur licences in force in the United Kingdom was as follows:

Amateur Sound Licences A:11,367
Amateur Sound Licences B:276
Amateur (Sound Mobile) A:1947
Amateur (Sound Mobile) B:2
Amateur (Television) Licences: 166

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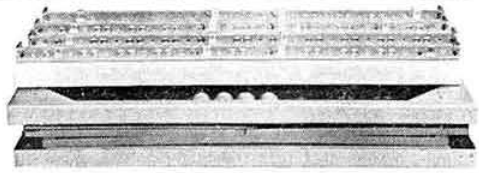

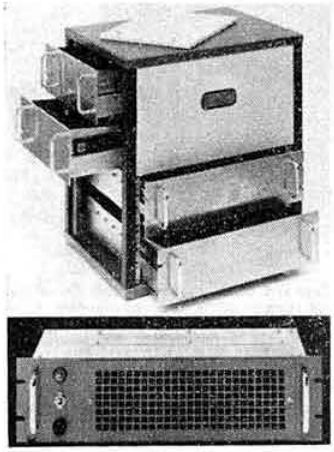

Illustrated is a Uniframe Kit unpacked prior to assembly – this clearly demonstrates the compactness of the system. Also shown is an 18C Unit assembled on a plinth with panel and chassis units inserted, and a rack built from an 18C Kit and an 18C extension Kit on a plinth. A unit with the opening back is also shown.

As is well known the Uniframe Kit has many useful and functional accessories. One of the very latest is the BL 35 Blower Unit. This unit can be incorporated with the Uniframe or used alone. It is invaluable for use when storing delicate scientific instruments and only costs £16 complete.

RACK AND CABINET PROBLEMS

The principle of **UNIFRAME** is so simple even a schoolboy could erect one. Uniframe cabinets can be erected – and dismantled – in minutes. A flexible, expandable, modular kit construction system it is designed to achieve the rapid and cheap assembly of cabinets at a cost that is 7% to 10% cheaper than most other equivalent racks and cabinets. The Standard Kits range from £6–£14 each.

The system is primarily designed for 19" panel systems at standard P.O. Unit pitching, but two smaller panel widths can be used by re-orientation of the assemblies.

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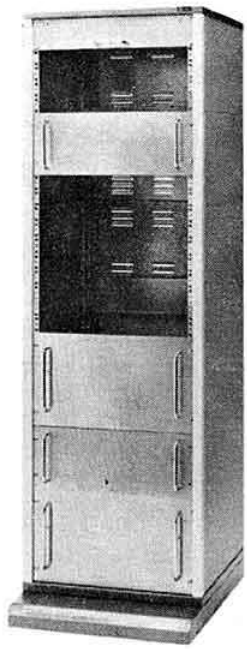

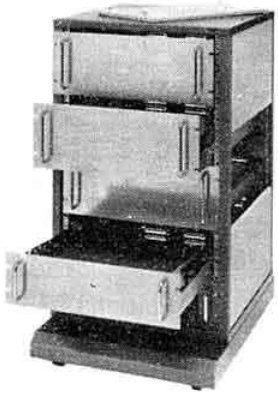

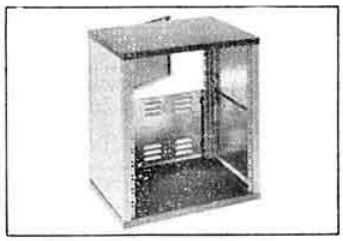

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MISCELLANEOUS

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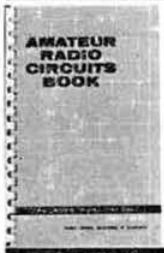

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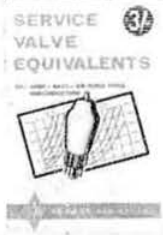

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