

R.S.G.B.



BULLETIN



JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN
VOLUME 24 · No. 2
AUGUST, 1948

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R.S.G.B. BULLETIN

OFFICIAL JOURNAL OF THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN

Published on or about the 15th of each month.

Issued free to members.

Editor:

JOHN CLARRICOTS

Editorial Office:

NEW RUSKIN HOUSE,
LITTLE RUSSELL STREET,
LONDON, W.C.1

Telephone: Holborn 7373



Advertisement Manager:

HORACE FREEMAN

Advertising Office:

PARRS ADVERTISING LTD.,
121 KINGSWAY,
LONDON, W.C.2

Telephone: Holborn 2494

Honorary Editor: ARTHUR O. MILNE

VOL. XXIV

AUGUST, 1948

No. 2

Band Planning

At the July meeting of the Codes of Practice Committee correspondence received from members, and other L.A.R.U. Societies, relating to the tentative R.S.G.B. Band Plan was studied. It was noted that in general there was no objection to Band Planning in principle but that some divergence of opinion had arisen over the proposed *shared* portions of the bands.

A member of the Committee made the following comments in respect of the advantages of retaining a portion of the bands for mixed telephony and telegraphy operation:—

"In stating a case for a three-section plan with a telegraphy allocation, a telephony allocation, and a shared allocation, it is necessary to have before us the diverse needs to be met by any final compromise plan. Our plan *must be a compromise* if it is to be acceptable to us, to our European colleagues and, we trust, finally to the whole world-wide Amateur movement. It must respect the needs and desires of all—right down to each individual even if it is not possible completely to meet those desires. Thus a plan giving 200 kc/s. of a 400 kc/s. band exclusively to C.W. would almost certainly prove unacceptable in a Continent such as South America where all but a moiety of operation is by telephony.

"Again, our final plan must be a compromise so as to put every groaning kilocycle of our meagre allocation to its fullest possible use not only through those hours when we, in these islands, are on the air but—for every hour of the twenty-four—for summer and winter—for every year of the 11 year sun-spot cycle—during Contests—and during the stillness of a band dead to DX when local contacts are in order. Everyone should consider carefully their own favourite band as a specimen and consider the implications.

"As to the proportions—only a Solomon would care to attempt a clear cut judgment between the demands from telegraphy and telephony operators. Suggestions coming from meetings held in this country varied between 75 per cent. for phone and 25 per cent. for C.W. to 25 per cent. for phone and 75 per cent. for C.W.!!

"It is the unassailable rigidity that transpires against the two section plan—no longer would you be able to go over to the key if fading and QRM brought the contact near to a sudden demise. The presence of the criticised shared portion removes this rigidity. It also provides the elastic membrane which, when pressure of occupancy becomes

greater on one side, as during a Contest, permits the economic balance to be found whilst the minority, for the time being, be they phone or C.W., can still gain protection within their exclusive—though small—assignments."

The Committee still feel that despite the number of letters received on the subject of Band Planning, only about 5 per cent. of members holding Amateur Transmitting licences have so far expressed any definite opinion on this matter.

It is therefore suggested that local groups should discuss the subject at their next meeting and that Town or Area Representatives should forward to H.Q. via their County or Regional Representative the results of such discussions stating how many members were present at the meeting. In view of the disappointing results of post-card votes, it is felt that this system will provide a much better guide to the Committee.

As an interim measure the Committee suggests to the membership that on the 3.5 Mc/s. Band all stations should endeavour—pending final agreement—to adhere to the following Band Plan:

3500–3600 kc/s.	..	Telegraphy only.
3600–3635 kc/s.	}	..
3685–3800 kc/s.		

Release of the Band 145–146 Mc/s.

The band 145–146 Mc/s. will be released to U.K. amateurs on September 1 next. Telegraphy and telephony operation will be permitted with an input power of 25 watts. As vital services are operating in adjacent bands every care must be taken to avoid off-frequency operation.

Members will appreciate that this facility has been obtained by the Society in advance of the coming into force of the Atlantic City Conference Allocations Table.

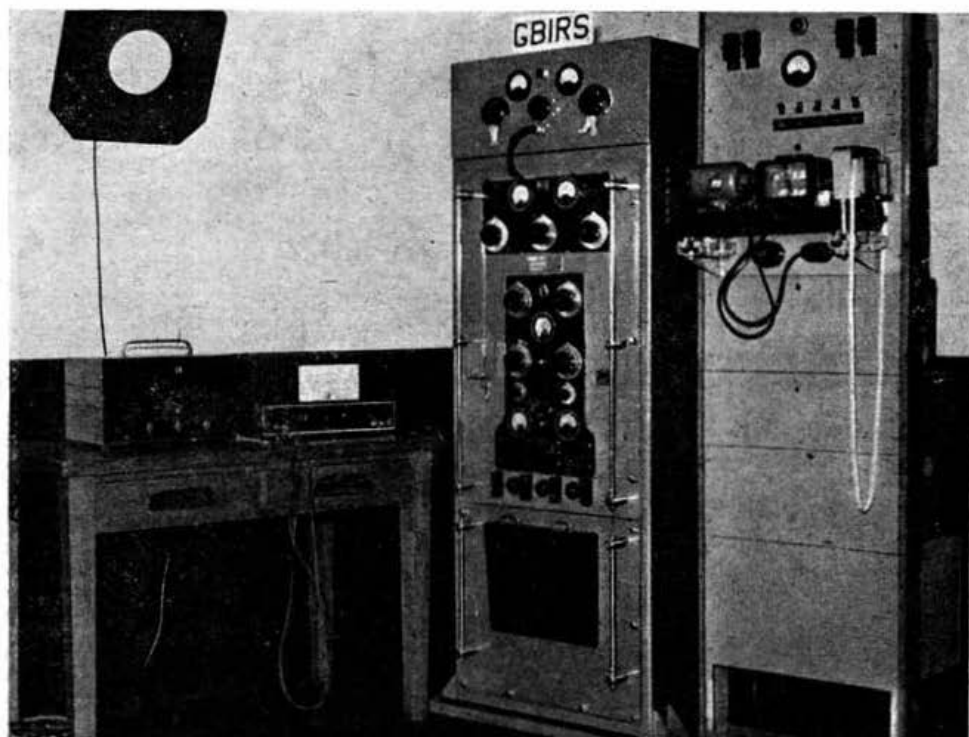
At the time this issue closed for press, frequencies in the band 420–460 Mc/s. had not been released but negotiations between the Society and the G.P.O. were continuing.

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HEADQUARTERS' STATION GBIRS

MARKER SERVICE TO BE INAUGURATED ON SEPTEMBER 1st.



General view of Headquarter's Station, GBIRS, showing left to right: E.M.I. Frequency Meter, Eddystone 640 Receiver, E.M.I. Presentation 500 watt Transmitter with aerial coupler mounted on top, and the Control Unit containing crystal oscillator, multiplier stages, automatic sender and relays with trickle charger, power and crystal oven supply units. The perforated tape on which the short message is recorded may be clearly seen in front of the Control Unit.

SEPTEMBER 1st, 1948, will mark an important event in the history of the Society, for on that day the Headquarters' transmitter will make its debut at 20.00 B.S.T. with the first regular transmission of standard frequency signals for British Isles Amateurs. This will represent another step forward in the development of a Headquarters' technical unit, a process so greatly stimulated by Sir Ernest Fisk, Managing Director *E. M. I. Ltd.*, with his magnanimous gift, and by the numerous other concerns and individuals who have so kindly contributed with apparatus or assistance.

Marker Service

The transmissions—lasting a few minutes—will be made at each hour from 06.00 to 24.00 G.M.T. (or B.S.T. as in force) in Morse code at 12 words per minute as follows:

CQ de GBIRS (repeated) QRG 3500-25 kc/s.

VA GBIRS (followed by long dash).

The frequency will be 3500-250 kc/s., providing a marker which, together with its harmonics, will give points below which an amateur transmitter working on the 3.5, 7, 14, 21 or 28 Mc/s. bands cannot be considered "safely inside." (It had been hoped that the service could operate on 3500-000 kc/s., but the licensing authorities have insisted on maintaining a "guard" to keep all sidebands inside the amateur band.)

The accuracy of the frequency cannot be certified until the transmissions have been on the air for some while, but the aim is one part in a million ($3\frac{1}{2}$ cycles

at 3.5 Mc/s.) and the apparatus is believed to be able to give this degree of accuracy.

Preparatory Work

With the gift of the transmitter(1), Council appointed a small Committee to deal with the problem of using it in the interests of the membership. They were, of course, inspired with hopes of Broadcast Bulletins, an exemplary amateur station, slow Morse, or even Empire communication.

The whole problem was considered deeply, and attempts were made to obtain accommodation and a suitable licence. The Committee finally recommended that until better accommodation was available at Headquarters, or elsewhere, the transmitter should be set up at New Ruskin House to run automatically and make hourly transmissions of band-edge marker signals; 3.5 Mc/s. being recommended as likely to give the most general coverage.

This plan was adopted and work was put in hand to bring together all the necessary equipment.

The Station

The Station comprises the transmitter, standard frequency drive unit, automatic sender, clock and timing mechanisms, co-ordinating control gear, and aerial facilities.

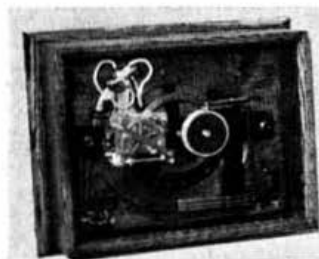
Transmitter

The transmitter will be seen on the left in the photograph, with its aerial coupler mounted on top. The

transmitter has been described already(1); briefly it is self-contained, will tune to all amateur bands up to 28 Mc/s. and has an output of 350 watts from two 813 valves. It is arranged for master oscillator or plug-in crystal control, and it has been found possible to drive it from an external source over a 100 ohm line with the aid of a unit to plug into the crystal socket. This unit contains a tuned auto-transformer shunted by resistance to "kill" the feedback of the crystal oscillator circuit (one watt into 5000 ohms to drive the 807 valve).

Drive Unit

The control rack stands to the right and comprises (top to bottom) control unit, Wheatstone transmitter, power unit, standard frequency oscillator, multiplier and crystal oven supply. The oscillator is of a G.P.O. precision type using a 100 kc/s. crystal of special design mounted in a constant temperature chamber. The crystal is connected into one arm of a bridge circuit, where it is balanced at resonance against the resistance of a lamp. The two



The Synchronome Master Clock (right) and Programme Controller (left). These units automatically switch on the transmitter at five minutes to each hour from 0600 to 2400 B.S.T. (or G.M.T.), and at the hour start the Wheatstone sender.

diagonals of the bridge are connected with the input and output of a high gain amplifier. In the oscillating state the bridge is very slightly unbalanced to an extent depending on the power flowing into the lamp, and the frequency and amplitude of oscillation are thus to a very high degree, independent of the valves or load. However, as with all crystal oscillators, the frequency can be moved slightly by connecting reactance in series with the crystal, and in this way the frequency has been raised by 71.4 parts per million to make the final frequency of 3500.250 kc/s. The oven thermostat is also a bridge, using three arms of Eureka wire (of low temperature coefficient) and one arm of nickel wire. The bridge thus balances at a certain temperature. Below this temperature, the amplified unbalance A.C. output will operate a gas-relay valve causing heat to be applied until the balance is restored. The cycle is a few seconds, and the temperature is steady to a small fraction of a degree.

The multiplier unit is supplied with a few milliwatts from the standard oscillator, and raises the frequency in steps of 7 and 5 to 3500 kc/s., with one watt output.

The Clock and Control Unit

In order to time and control the transmissions a Synchronome master clock and programme controller were installed. The clock is of the electrically driven invar pendulum type and can keep time within a few seconds per month. The programme controller is operated by one-second impulses from the clock, and closes up to four circuits at any desired preset times to a fraction of a second accuracy. It has been set to close three circuits in sequence at minus 5 minutes, zero, and plus 5 minutes each hour, these circuits being connected with the control unit.

Space will not permit an adequate description of the "brain" of the set-up, but it may be possible to illustrate the circuit later.

At five minutes to the hour the transmitter is switched on to warm up. At the hour the Wheatstone auto-sender starts and the perforated tape makes one round trip to key the message to the transmitter, finishing with a ten-second dash. The long dash operates a delayed action circuit by which the transmitter is shut down and everything left set for the next hour. At five minutes past the hour, the third clock operation makes a test to ensure that the transmitter is not still on. Should this or any of a number of other faults develop, the control unit will close the station down and light a warning lamp till attention is given.

Aerials and Aerial Coupler

The aerial system presented a problem, since the only space was over the roof of a gaunt, ferro-concrete building, with barely room for a 66 ft. top, and no "earth" of any consequence. It was necessary to out-rig two heavy masts on the ends of the building, and the Society is grateful to Messrs. Allen & Unwin, Ltd., for giving them permission to make these arrangements. This enabled the Committee to erect a centre-fed dipole which could be used on 7 Mc/s. or on 3.5 Mc/s. as a Tee aerial, against an earth consisting of all the metal work of the roof.

This connects by concentric cable link with the transmitter, and provides preset aerial transformers for 3.5 and 7 Mc/s. together with a 400-watt dummy aerial and selector switch.

Conclusion

It will be appreciated that this service is in the nature of an experiment, and that there are many factors which can only be regulated by experience. The transmitter is there for the benefit of the membership, and the Committee will take steps to extend or improve the services given whenever possible.

In the meantime, regular reports from all directions and distances will be both welcome and useful.

Contributors to GBIRS

- Transmitter, Frequency Meter and Modulation Meter, presented by Messrs. E. M. I., Ltd., Hayes.
- 100 kc/s. Standard, loaned by G.P.O. Eng. Dept.
- Clock, Programme Controller, supplied by Messrs. The Synchronome Co., Ltd., Alorton, Middx.
- Wheatstone Transmitter, supplied by Air Ministry.
- Aerial Masts, presented by Messrs. Calders, Ltd., 29 Regent Street, London, W.1; Erected by Arthur Beale Ltd., 129 Shaftesbury Avenue, London.
- Aerial and Aerial Coupler, supplied by Messrs. Odeon Radio, Harrow, Middx.
- Transformers, presented by Messrs. Haynes Radio, Queensway, Enfield, Middx.
- Control Unit, Multipliers, etc., constructed by The Committee.
- Eddystone Model 640 Receiver, presented by Messrs. Stratton & Co., Ltd., Birmingham, 31.
- V55R Receiver, presented by Radiovision Ltd., 58-60 Rutland Street, Leicester.
- Taylor Test Set Model 90A, presented by Taylor Electrical Instruments Ltd.

(1) Described in R.S.G.B. Bulletin Dec. 1946 and Jan. 1947.

A CRYSTAL CONTROLLED TRANSMITTER FOR THE TWO-METRE BAND

Described by W. H. ALLEN, M.B.E., (G2UJ).*

NOW that the G.P.O. have agreed to release a portion of the 2 metre band on September 1 next and bearing in mind the widespread interest being shown in this new band, we are glad to publish details of a crystal controlled 2 metre transmitter, for the design and construction of which we are indebted to Mr. E. A. Dedman, G2NH, of New Malden.

The Circuit

Reference to Fig. 1 will show that the valve line-up—quite conventional and straightforward—consists of a Mullard EF 50 triode working as a crystal oscillator-treiber, capacity-coupled to a Mullard QVO4-7 trebler which is similarly coupled to another QVO4-7 serving as a doubler, and feeding RF at 144 Mc/s. to the grid circuit of a twin tetrode power amplifier. In this manner a fundamental frequency around 8 Mc/s. is multiplied 18 times in three stages, and more than sufficient power is generated to supply the modest grid drive requirements of the PA and to overcome the high circuit losses inevitable at these frequencies.

Although tetrodes are employed in the PA, some neutralisation will be found necessary at VHF, but this is very easily—and cheaply—accomplished by means of two 14 S.W.G. wires connected one to each grid and with their other ends brought to within about $\frac{1}{4}$ " of the glass of the valve adjacent to the opposite anode. The very small capacity thus produced will be found sufficient completely to stabilise the stage. Further notes on adjustment will be found under the heading "Operation."

The output tank circuit is conventional, except for the absence of any bypass capacity either from the coil centre-tap or from the rotor of the series-gap tuning condenser. Output is taken by way of a link-winding to a pair of sockets mounted above the PA tuning condenser.

Screen and plate modulation may be applied to the PA valve in the usual manner, while CW keying is effected by breaking the cathode to the earth lead of V3.

Construction

The chassis, shown flat in Fig. 2, is constructed from a piece of 16 S.W.G. aluminium 17" by 10". A lip, $\frac{1}{2}$ " wide, is formed down the two long sides for adding strength, and bent inwards as indicated in Fig. 3a. The dimensions of the finished chassis are, therefore, 17" long, 4" wide and 2 $\frac{1}{2}$ " deep. Two additional pieces of the same material are used for the PA valve screen and the supporting bracket for the anode tank and output circuits. These are constructed according to Figs. 3b and 3c respectively. The latter items are secured to the chassis by means of pieces of $\frac{1}{4}$ " angle and PK self-tapping screws, but 4BA bolts and nuts would provide a satisfactory alternative fixing.

In Fig. 4 is depicted the approximate positions of the main components under the chassis. No attempt has been made to show all parts and their associated wiring, but it is thought that the disposition of the

valve holders, RF bypass condensers and the "earthy" wiring in each of the first three stages would prove useful to intending constructors, as it has been the writer's experience that these details are often the most difficult to decide when designing a lay-out.

L1 is wound on an insulated former and screwed to the chassis, but L2, 3 and 4 are all self-supporting and soldered directly to the appropriate points on their respective tuning condensers. L7 consists of a piece of 14 S.W.G. enamelled wire of a total length of 6", soldered to the two grid pins on the valve holder of V4 (the cathode pin is at the bottom), and then brought out parallel to the chassis for about $\frac{1}{4}$ ". C15 is soldered in position at this point, and the actual coil hangs down, parallel with the valve holder and about 1" from it. L6 is placed close to L7 and secured to it with thread and polystyrene varnish. Variation in coupling is effected between L4 and L5.

The circular hole to the right of V3 has a disc of insulating material bolted beneath it through which the link between L5 and L6 passes, together with the connection from the centre tap of L7.

The PA Stage

Either an 829-B or an 832 valve may be used in this stage. The dimensions given in the diagrams are suitable for the former type, but if the 832 is to be installed permanently the bracket supporting the PA anode and output circuits should be moved 1" nearer the bracket upon which the valve holder is mounted, as the 832 is that much shorter in length. Although the base connections are the same for both valves, and they are, therefore, interchangeable, the grid current permissible is 12 mA. for the 829-B against 2.8 mA. for the 832, and some adjustments would require to be made in the link coupling between V3 and V4 to guard against over-driving the latter. In addition, the HT supply for the 832 should not exceed 500 volts, while the 829-B may be run as high as 750 volts if the maximum power output is required. The screen voltage is 200 for either valve.

Neutralising arrangements have already been mentioned. The necessary cross-over of the neutralising wires from one side of the valve to the other should be made before bringing them through the screen. The holes, indicated at the top of Fig. 3b, should be fitted with rubber grommets, and in addition the wires themselves are covered with sleeving so that a push fit is obtained to prevent vibration taking place. The length of each wire, measured from the screen, is 2", and they should be bent as indicated in Fig. 5.

C19 is of the "butterfly" split-stator type, and the particular component used in the transmitter described bears the R.A.F. reference number 10C/5980, but any similar condenser of approximately the same capacity—25 μ F. per section—could be used in this position, although another type might necessitate some modification of the bracket to accommodate different dimensions or fixing arrangements.

The two output sockets are mounted on a strip of

* 32 Earls Road, Tunbridge Wells.

insulating material so placed that they protrude through a rectangular hole in the bracket above the knob of C19. This is a suitable termination for L9 if a balanced feeder is to be used, but a concentric socket, such as that advertised by *Messrs. Belling Lee*, and other manufacturers, or the well-known *Pye* component to be found in much of the surplus VHF equipment, would be more appropriate should the constructor favour the use of co-axial feeder.

RFC 4 is secured to the chassis by a screw tapped into the base of the former, and the lead from this choke to the PA HT connection on the rear apron of the chassis should be insulated where it passes through the top deck either by a rubber grommet or a suitable feed-through insulator.

Power Connections

Connections to the power supplies are made through an octal plug and socket at the rear of the chassis, the hole for this being shown on Fig. 2, 5½" from the left hand side. The following leads are provided:—

Exciter HT positive. (320 volts max. at about 70 mA.)

PA screen positive.

PA grid bias negative.

PA "live" heater.

Exciter "live" heaters.

PA heater "earthy" side.

Exciter heaters "earthy" side.

The HT for the PA valve is led in separately via a high voltage plug located in the other hole shown in Fig. 2 on the rear apron of the chassis. This precaution is taken to give adequate insulation for the 750 volts which may be applied to the 829-B, and in addition provides a convenient connection for a modulator. Should, however, the HT supply with either an 829-B or an 832 not exceed about 500 volts, then there seems no reason why this HT connection should not be made on the unoccupied pin of the octal socket.

Operation

With the heater supplies connected, and a crystal of between 8,000 and 8,111 kc/s. inserted in the

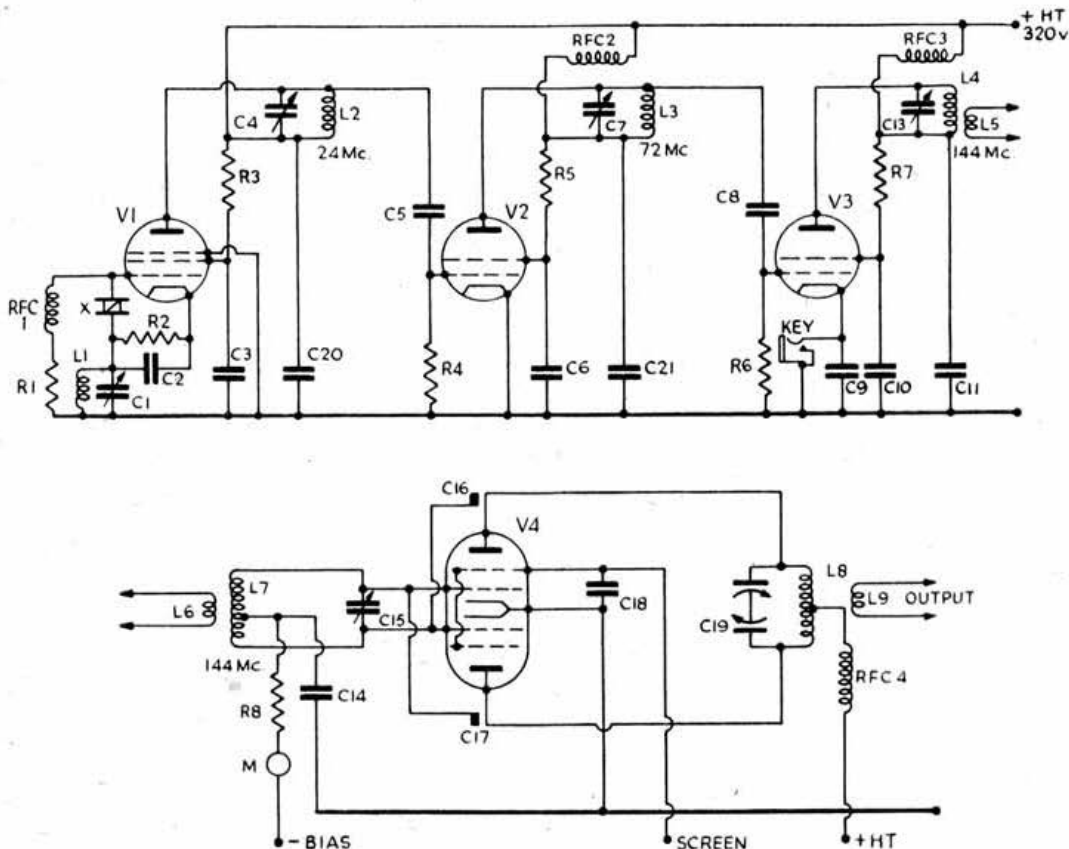


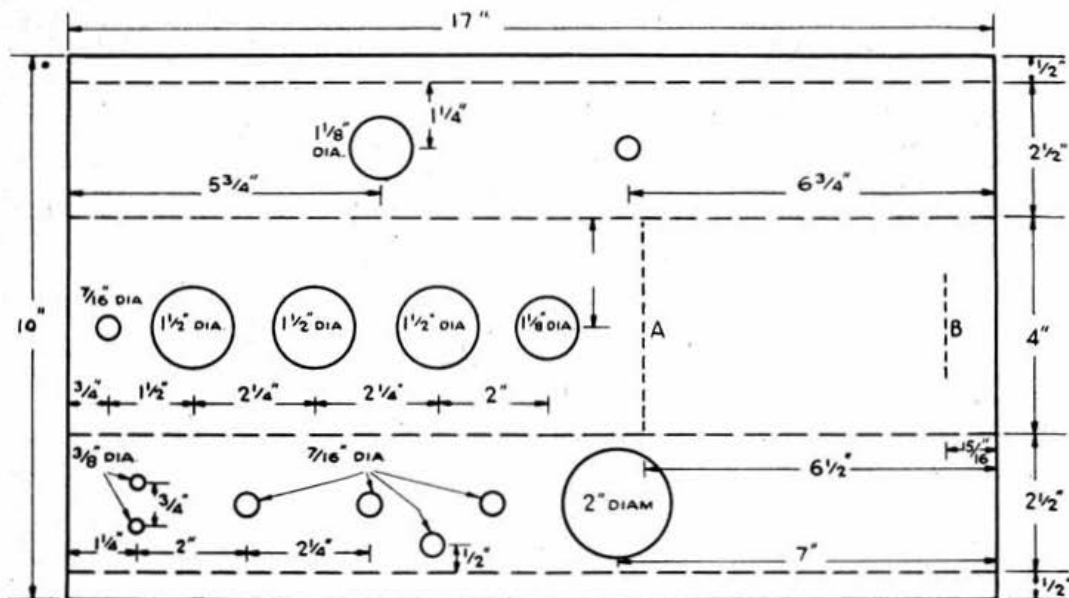
Fig. 1.

Circuit diagram of crystal controlled 2 metre transmitter.

- C1 75 μ F variable. Polar C802 or Eddystone 582.
- C2, 3, 5, 6, 9, 10, 11, 18, 20, 21 .001 μ F mica.
- C4, 7, 13 Polar C802 or Eddystone 580 (Type 580 is 15 μ F).
- C8, 14 .0005 μ F mica.
- C15 5 μ F Philips air-dielectric trimmer.
- C16, 17 Neutralising condensers. See text.
- C19 25 μ F per section "butterfly" split stator.
- R1 27,000 ohms.
- R2 470 ohms.
- R3 75,000 ohms.
- R4, 5, 6 100,000 ohms.
- R7 50,000 ohms.

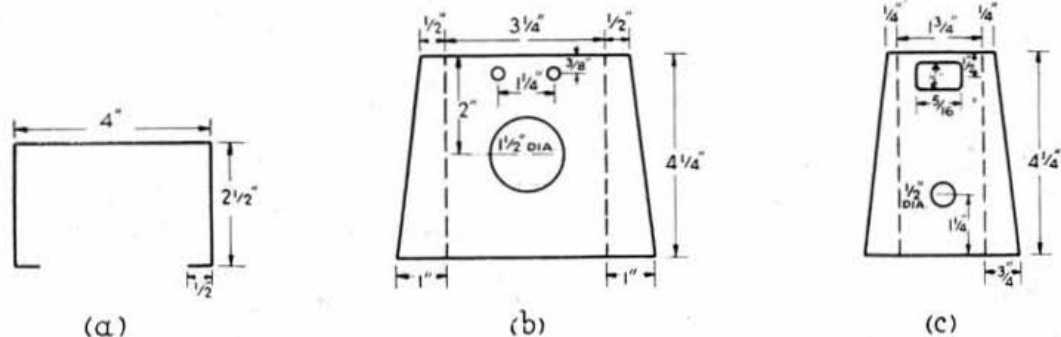
- R8 4,700 ohms.
- RFC1 Eddystone 4-pie choke No. 1010 (2 sections only).
- RFC2, 3 Eddystone No. 1011 choke.
- RFC4 48 turns No. 26 d.c.c. close wound on ½ in. former.
- M P.A. grid current meter. 25 mA. f.s.d.
- X Crystal. Frequency between 8,000 and 8,111 kc/s.
- V1 Mullard EF50.
- V2, 3 Mullard QV04-7.
- V4 Type 829-B or 832.

Note.—Additional .001 μ F mica condensers are connected from "live" L.T. to the nearest point on the chassis on the V3 and V4 valveholders.



crystal holder, connect a meter with a full scale deflection of about 100 mA. across the key contacts to measure the cathode current of V3. C1 should be at minimum, and the grid bias lead for V4 connected to chassis.

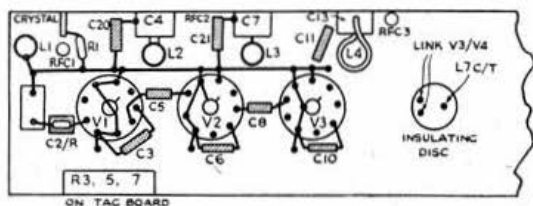
the low power in the first stage, and the small number of turns in the other coils. It must be remembered that in the absence of output from V1, the valve V3, and in turn V4 will be running at zero bias, and an excessive current will be drawn.



On applying about 300 volts HT to the exciter section *only*, the meter should read about 55 mA. if the circuits are completely out of resonance. Swing C4 for a *dip* in meter reading. If this cannot be found, increase slightly the capacity of C1 and try again. C1 may, with some crystals, have to be nearly at full capacity. As soon as a dip has been found for C4, adjust C7 also for a further dip, and then C13. The meter reading should now be approximately 40 mA. The dip due to C13 is sharp, but shallow. If C15—the *Philips* trimmer—is now slowly varied, grid current will show on the meter in the transmitter, and with the value mentioned of 320 volts on the exciter valves this was found to be 15 mA.

This method of preliminary tuning is strongly recommended as against that of coupling a bulb and loop to each circuit in turn, for unless a very low consumption bulb is employed no indications will be obtained from L2 and L3, and very little from L4 and L7. This is quite in order, and is due firstly to

Under these conditions HT should be applied for the shortest time sufficient for rapid adjustment of the condensers to be made, or alternatively, a resistance should be connected in series with the HT supply to lower the voltage during these preliminary adjustments. If any doubt is entertained as to whether the crystal is oscillating, V_2 and V_3 should be



withdrawn, and V1 tested alone, listening in a receiver on the crystal frequency for signs of activity.

Neutralising the PA Stage

Swing C19 and note carefully if any change occurs in the grid meter reading at any point. If such is the case the spacing of the neutralising wires from the glass envelope of V4 should be varied slightly, both by the same amount. If the effect on the meter is now *greater*, the variation was in the wrong direction, and a further adjustment must be made until no movement of the grid meter occurs when C19 passes through 145 Mc/s. resonance. The adjustment is not critical, however, and neutralising is far easier than with many lower frequency transmitters.

circuit of V3, enough external grid bias *must* be applied to limit the anode current to V4 to a safe value in the "key-up" condition, bearing in mind that the maximum anode dissipation of the valve (829-B) is 40 watts.

If a type 832 is used as PA, all the above figures must be altered so that the makers' ratings are at no time exceeded. It is definitely unwise, with either valve, to run even for a few moments without an RF load, unless the HT and screen voltages are reduced to a low value.

Conclusion

Great care must be taken to ensure that each circuit is tuned to the correct harmonic of the crystal, and this is

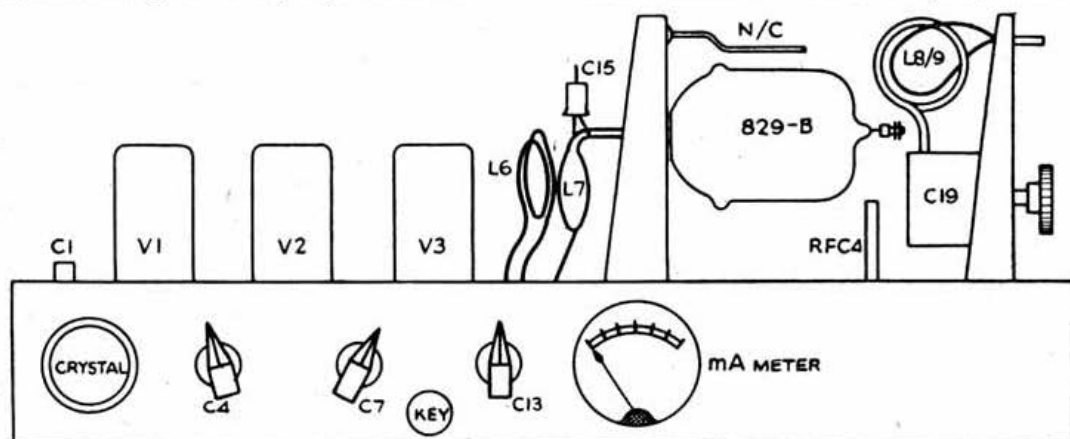


Fig. 5.
Side elevation of the transmitter.

Tuning the PA

Connect a 60 watt lamp across the output sockets, and apply about 500 volts to the PA HT connection, and not more than 200 volts to the screen. With this HT voltage, optimum output was secured with 150 volts on the screen, obtained from the HT supply through a resistance of 40,000 ohms. This type of valve is sensitive to variations in screen potential, and no more than is necessary for the desired output should be employed. C19 is now tuned to resonance, when the 60 watt bulb should light to a very fair brilliance with an anode input of approximately 60 watts. Adjustments should now be made to the coupling between L8 and L9, and to all tuning condensers including C1. The latter controls regeneration in the crystal circuit, and no more capacity than is necessary for adequate drive for V4 should be used.

For telephony operation the bias supplied by rectified grid current through R8 is sufficient for V4, but when operating CW, by keying the cathode

best ascertained with a calibrated absorption frequency meter such as was described in the May, 1948, issue of this journal. In the original version of the transmitter, C4 gave resonance only in the vicinity of 24 Mc/s. A very slight dip was detected when C7 tuned L3 to 64 Mc/s., but no difficulty should be encountered in deciding upon the correct 72.5 Mc/s. setting. C13 showed no spurious resonances whatever.

In presenting this design we feel that we are catering not only for the amateur who desires to make an exact copy of the prototype transmitter, but also for those who have in mind ideas of their own for similar apparatus and who may find the layout, valve sequence or coil details of value to them. With slight modifications to the chassis a linear anode tank circuit could replace the coil and condenser arrangement shown, making even higher RF output possible, and we look forward to hearing from readers of their experiences with this transmitter or with any other successful variations of the design.

Coil Table

Coil	Winding Data
L1	24 turns No. 26 enam. close wound on $\frac{1}{2}$ " diam. former.
L2	13 turns No. 14 enam. close wound, $\frac{1}{2}$ " diam. self-supporting.
L3	3 turns No. 14 enam. spaced two wire-diameters, $\frac{1}{2}$ " diam.
L4	1 turn $\frac{1}{8}$ " silver-plated copper tubing, $1\frac{1}{2}$ " diam.
L5	2 turns No. 18 enam., $1\frac{1}{2}$ " diam.
L6	2 turns No. 14 enam., $1\frac{1}{2}$ " diam.
L7	$\frac{1}{2}$ turn No. 14 enam., $1\frac{1}{2}$ " diam.
L8	2 turns $\frac{1}{8}$ " silver-plated copper tubing, $1\frac{1}{2}$ " diam., length 1".
L9	2 turns No. 14 enam., $1\frac{1}{2}$ " diam.

The Amateur Radio Exhibition

Members in the London Region are invited to offer for display on the Society's stand at the forthcoming Amateur Radio Exhibition, items of well constructed and well designed amateur equipment. Offers should be accompanied by a brief description of the equipment and, if possible, a photograph.

Members whose offers are accepted will be notified well in advance of the opening of the Exhibition. The equipment will be required for approximately one week.

Offers should reach the General Secretary by September 1 next.

A SIMPLE SPEECH-CLIPPING CIRCUIT

By P. F. CUNDY, A.M.I.E.E., (G2MQ.)*

THIS article gives details of a speech-clipping arrangement which is effective in permitting a very marked increase in average modulation level without over-modulation on speech peaks. The circuit is considerably more simple than the majority so far published.

The Peaky Nature of Speech Wave-forms

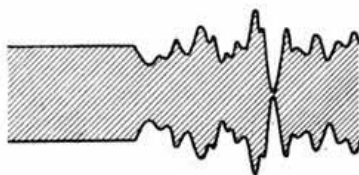
Fig. 1 represents a "snapshot" of a portion of a typical speech wave-form. The important features, as far as this discussion is concerned, are the short duration and relative infrequency of the major peaks and the fact that the peaks are generally higher on one side than on the other.



Fig. 1.
Typical speech wave-form, showing relative infrequency and asymmetry of major peaks.

If a transmitter is conscientiously adjusted to yield 100 per cent. modulation on peaks, the modulated envelope produced by the wave-form of Fig. 1 would be as either Fig. 2 or Fig. 3, according to whether the higher peak drives the carrier downwards or upwards. Fig. 3 represents a higher average level of modulation and should always be used, the change from Fig. 2 to Fig. 3 being made by reversing the microphone leads or one winding of any transformer in the audio chain.

Fig. 2.
Modulated envelope produced by the wave-form of Fig. 1 with downward modulation by the larger peaks.



The modulation depth of Fig. 3 is not enough, however, and a station employing this form of modulation would not be fully intelligible if conditions were difficult. The receiving station would report "low modulation," and the audio gain control would be advanced, with a result similar to that

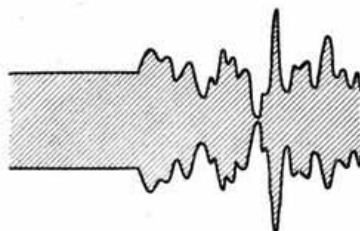


Fig. 3.
Modulated envelope produced by the wave-form of Fig. 1, with upward modulation by the larger peaks.

illustrated in Fig. 4. The signal would then be much easier to follow, as far as the distant receiver was concerned, but the effect upon nearby receivers would be devastating. The vast majority of signals on the DX bands are like this or worse, and the remedy is some form of clipping circuit which will limit the audio output voltage so that the R.F. output is never entirely cut-off. Fig. 5 represents the same signal as that shown in Fig. 4 and with the same modulation depth, but with negative peak clipping introduced.

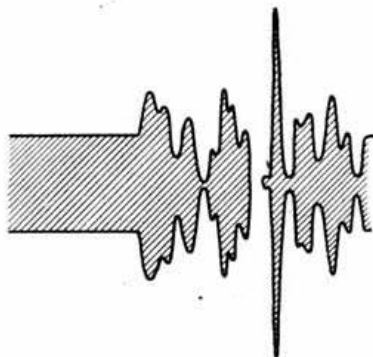


Fig. 4.
A signal with high average modulation level, showing gross over-modulation on peaks.

The Peak-Clipping Circuit

Two methods of peak-clipping have hitherto been suggested, "high-level" clipping, applied between the modulator and the modulated stage, when only the negative peak is clipped, and "low-level" clipping, of both peaks, at an early stage of the speech amplifier. In either case it is desirable to follow the clipper by a low-pass filter to prevent the high-order harmonics introduced by the clipping from producing unnecessary side-bands. Since it is not easy to construct an audio-frequency low-pass filter of high characteristic impedance, the inclusion of such a filter in the low-level case results in some loss

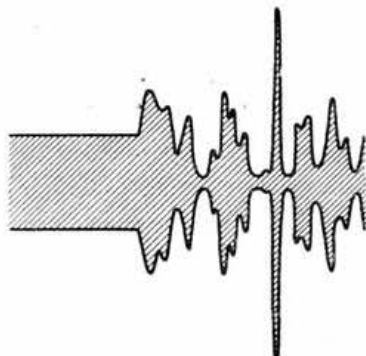


Fig. 5.
A signal with high average modulation level, with over-modulation prevented by negative peak-clipping.

* 52 Highfield Close, Amersham, Bucks.

of audio gain, by directly or indirectly lowering the anode load of one of the stages. Thus, for the "conventional" low-level clipper, an extra amplifier stage, as well as the clipper diodes and their biasing circuit, is required. The high-level clipper uses fewer components, but, as they are subjected to high D.C. and audio potentials, they become bulky and expensive. Low-level clipping need not take place on both peaks. Clipping on one side is sufficient, provided that the phasing is subsequently adjusted so that the unclipped peaks drive the carrier upwards. One-sided clipping will result in displacement of the

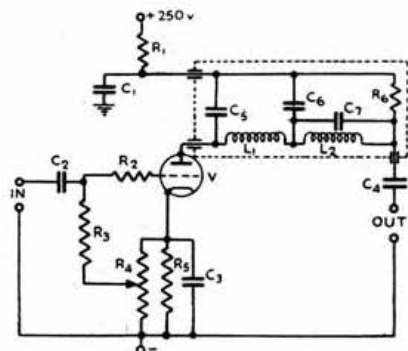


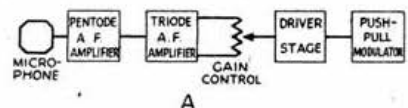
Fig. 6.

Circuit diagram of the clipper stage.

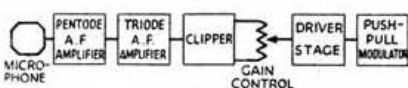
C1	4 μ F.	C6	0.02 μ F.	R4	10,000 ohms.
C2	820 pF.	C7	0.01 μ F.	R5	1,500 ohms.
C3	8 μ F.	R1	10,000 ohms.	R6	3,600 ohms.
C4	2,000 pF.	R2	100,000 ohms.	L1	0.312 H.
C5	0.012 μ F.	R3	330,000 ohms.	L2	0.104 H.

speech waveform about its zero line. Any usual interval coupling circuit will adjust itself so that the areas enclosed by the wave-form above and below the zero-line are equal, and clipping will momentarily upset this equality. The effect of this axis-shift appears to be insignificant in practice, but, as a precaution, all coupling condensers after the clipper should be as small as possible, to permit of rapid restoration of the natural zero-position.

Fig. 6 shows the diagram of a single-sided clipper, combined with an extra audio stage and a low-pass filter. The bias on the triode is adjustable by R_4 to any value between 0V. and -4.5 V. At -4.5 V. the operation of the stage is normal in every way. Upon reducing the bias, however, a point is reached where positive signal peaks drive the valve into grid-current, but a positive excursion of the grid potential is prevented by the grid current flow through R_2 and R_3 . If subsequent phasing and gain is correct, this can also prevent downward modulation of the carrier beyond a safe point. A small coupling condenser, C_2 , is desirable here; its inclusion serves also to reduce the bass response—an advantage for "communication quality" speech.



A



B

Fig. 7.

Amplifier block diagram, showing position of clipper stage. (A) Without clipper. (B) With clipper.

Construction

Fig. 7 shows the block diagram of a typical speech amplifier before and after the addition of the clipper stage of Fig. 6. The low-pass filter is a constant- k section, terminated with an m -derived half-section of $m=2/3$. The cut-off frequency (3700 c/s.) and terminating resistance (3600 ohms) were determined by the desire to use existing inductors and standard capacitors. A filter termination between 2000 and 6000 ohms would be suitable, with a cut-off at 3000 to 4000 c/s.

The following filter design formulae are given so that any available inductors can be used. Suitable values can often be found among the older types of broadcast band H.F. chokes.

If L is the value of L_1 in Henrys, then $L/3$ is the value of L_2 in Henrys.

If C is twice the value of C_5 in Farads, then $5C/6$ is the value of C_6 , and $5C/12$ is the value of C_7 in Farads.

$$\text{Cut-off frequency} = 1/\pi \sqrt{LC} \text{ c/s.}$$

$$\text{Terminating resistor} = \sqrt{\frac{L}{C}} \text{ ohms.}$$

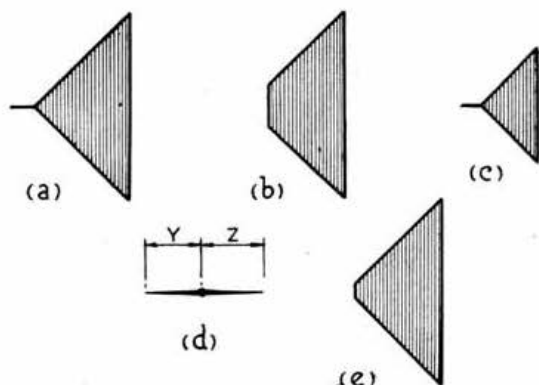


Fig. 8.

Typical oscilloscope patterns.

(a) Showing 30 per cent. over modulation. (b) Clipper in operation with correct phasing. (c) Clipper in operation with incorrect phasing. (d) Pattern used to adjust microphone phasing. (e) Correct pattern, corresponding to Fig. 5.

Adjustment

The operator's own voice, applied *via* the microphone, is a satisfactory test-signal. Apparatus required is an oscilloscope, connected to give the usual trapezoidal pattern, a dummy aerial and a dummy load for the modulator. Adjustment takes three distinct steps, namely:—

(i) Determine the direction in which the modulator output must be applied to the modulated stage so that the clipped peaks are the ones that tend to reduce the carrier.

(ii) Adjust the phasing so that the smaller peak drives the clipper grid towards positive values; this will leave the larger peaks unclipped—to increase the carrier—while the smaller peaks—which tend to reduce the carrier—are clipped above a certain value.

(iii) Adjust the clipper setting and subsequent gain so that it is impossible to reduce the carrier to zero.

These three stages will now be explained more fully.

Stage (i). Set the clipper bias to maximum, and, with normal speech level at the microphone, advance the gain control until 125 to 130 per cent. modulation is indicated on the oscilloscope (Fig. 8a). Leave the gain control set at this point for all later adjustments. This and all subsequent tests should be carried out with the transmitter-loaded to normal operation with an artificial aerial.

Reduce the clipper bias to zero, and note if the spike and apex (Fig. 8b) or the base (Fig. 8c) is fore-shortened. If the latter occurs, reverse the secondary leads of the modulation transformer. Re-adjust clipper bias to maximum.

Stage (ii). Remove the high-voltage supplies from all R.F. stages, disconnect the modulation transformer secondary leads, and connect an audio frequency dummy load across it. Upon applying the audio signal, the oscilloscope pattern will now be a line with a bright spot indicating the zero-point (Fig. 8d). Observe distances y and z and find the direction in which to connect the microphone that will make y (the direction towards the place where the triangle's apex was located) less than z . Remove the A.F. load, re-connect the modulation transformer in the same sense as determined in Stage (i), and re-apply high tension to the transmitter.

Stage (iii). On re-application of the audio signal, a pattern similar to Fig. 8a should re-appear. With the signal maintained at constant level, slowly reduce the bias on the clipper stage until the spike disappears and a small flat appears at the apex of the triangle (Fig. 8e). Adjustment is now complete. Unless the

cathode ray monitor is permanently connected, the position of both the bias and gain controls should be marked and always used for DX work.

For local working, unclipped speech may be preferred, in which case the clipper bias should be set at maximum and the gain control reduced to yield 100 per cent. modulation on speech peaks only, a procedure which will reduce the average modulation depth to about 30 per cent. Alternatively, both the above controls could be pre-set, and an additional gain control introduced between the first two stages. This new control would be set at maximum for DX working, and adjusted for local contacts so that the peak input to the clipper is less than its (reduced) standing bias.

Quality

The distortion introduced by the clipper is not detectable by a DX station, and on local contacts the difference is discernible only when using a very high-quality microphone. When using a carbon microphone, or any medium-priced crystal or dynamic instrument, the distortion is entirely masked by microphone resonances and similar effects.

STANDARD FREQUENCY TRANSMISSIONS IN GREAT BRITAIN*

THE question of radiating standard frequency transmissions from Great Britain has recently been under consideration. Such transmissions are of great value in connection with the calibration of industrial and scientific frequency sub-standards, in connection with work on radio wave propagation and also for survey purposes. At present standard frequency transmissions of guaranteed accuracy are emitted by the U.S.A. National Bureau of Standards (1) continuously on the eight frequencies 2.5, 5, 10, 15, 20, 25, 30 and 35 Mc/s. from station WWV. Unfortunately, on account of radio propagation conditions, it is often difficult to make good use of the U.S.A. transmissions in Europe and further east. At the recent meeting of the International Telecommunications Union at Atlantic City, U.S.A., it was agreed that the first six of the above frequencies (i.e. 2.5, 5, 10, 15, 20 and 25 Mc/s.) should be allocated on a world-wide basis for all future standard frequency transmissions. Hence, if undesirable interference between such transmissions is to be avoided, all new services of standard frequency transmissions will require very careful co-ordination with existing services.

In Great Britain, an experimental low power transmission from station GMT, on a frequency of 2 Mc/s., has been set up by the Royal Observatory at Abinger, Surrey, to facilitate comparisons between quartz clocks used in the operation of the Greenwich time service. Details of this service have been published recently(2). Since no other British standard frequency service is at present available, these transmissions have been fairly widely used, and a substantial increase in power is under consideration.

In existing circumstances the provision in this country of a comprehensive service on a number of the available frequencies will take some considerable time; but arrangements are now under consideration whereby a limited standard frequency service on three frequencies will be operated by the General Post Office. It is hoped that experiments connected with the new service will demonstrate the feasibility and value of United Kingdom and European coverage.

* Contributed by the Department of Scientific and Industrial Research.

and also the degree of interference from and with the WWV transmissions.

Details of this experimental service will be announced later, but meanwhile those who require such a service may be interested to know that the frequencies of the following transmitters of the General Post Office and of the B.B.C. are maintained at their nominal values to a tolerance better than \pm one part in one million.

Station's Call Sign.	Nature of Service.	Location.	Nominal Frequency kc/s.
GBR	Telegraph	Rugby	16
—	Broadcast	Droitwich	200
GRO	Broadcast	Skelton	6,180
GSB	Broadcast	Daventry	9,510
GSV	Broadcast	Daventry	17,810

It may further be noted that the B.B.C. medium wave transmitters, with the exception of that on 583 kc/s. (514 m.), are also maintained on their nominal frequencies to a tolerance of approximately \pm one part in one million.

References

- (1) National Bureau of Standards (U.S.A.). Letter Circular LC886, January 30, 1948.
- (2) *Wireless World*, November, 1947, Vol. 53, p. 439.

GB1RS

WILL COME INTO
OPERATION AS A
FREQUENCY MARKER
STATION AT 8 p.m.
ON WEDNESDAY,
SEPTEMBER 1st, 1948

FREQUENCY 3500 · 25 kc/s.

AN AUSTERITY EXCITER

By JAMES N. ROE, M.I.R.E. (G2VV)

THE exciter here described is the outcome of an effort to produce an efficient driving unit at low cost. All components used—with the exception of the switched crystal holder—are of pre-war vintage or Government disposal parts.

Most amateurs have, at least, one 6L6 (or 6V6) and one 807 around the shack and it was with this knowledge in mind that the ever-popular 6L6-807 valve combination was chosen.

No meters are embodied in the design but provision is made for their inclusion in each stage. In the writer's case the unit is housed in a large rack and meters are mounted on separate panels.

Circuit and Constructional Details

Fig. 1 shows that the circuit is perfectly orthodox and employs a 6L6 (or 6V6) valve as a triode oscillator, the output of which is capacitively coupled to an 807 valve functioning as a buffer or doubler. When used for the latter application, ample output is available for driving two PT15 valves (or similar type) in a push-pull RF amplifier circuit.

Keying is arranged in the cathode circuit of the 6L6 affording ease of operation for break-in working.

Many amateurs have already purchased complete Type 1154 transmitters, or Type 1154 tuning units, and for this reason it was decided to use a section of the MO tuning unit as a switched inductance in the anode circuit of the triode oscillator. This arrangement—coupled with the 4-position switched crystal holder—permits quick band change and selection of spot frequencies. If desired, the multi-crystal

holder and tuning unit can be replaced with the more usual single crystal holder and plug-in coils. The choice rests with the individual constructor.

The chassis used by the writer had been in service some years before the war and, in consequence, had several unusable holes. It is remarkable how many existing holes are always "just that much out" when a chassis is fitted with different components!

In view of the foregoing no apologies are necessary for the odd holes seen in the photographs of the chassis.

Chassis measurements are $9\frac{1}{2}'' \times 6'' \times 2''$ and the tuning unit panel measures $7\frac{1}{2}'' \times 5\frac{1}{2}''$.

The 1154 tuning unit has two tapped coils mounted on an ebonite panel. This was removed complete from a 1154 transmitter. Anyone who undertakes this task should allow about three hours for the "dismembering" operation. How that shellac sticks—and it is well gummed on all threads!

Reference to Fig. 2 shows that only one tapped coil is used. Original tests were carried out using the second (and smaller) coil as a switched FD inductance and, although it behaved quite well up to 14 Mc/s. the losses were very high at 28 Mc/s. This condition had been anticipated but it was felt worthwhile to "have a go."

The final arrangement shows a plug-in coil on a 4-pin base which is mounted on 2" pillars to permit a short anode lead to the 807. The FD tuning condenser (C9)—mounted on the panel—is immediately under the coil holder.

It will be noticed that the two valves are in close

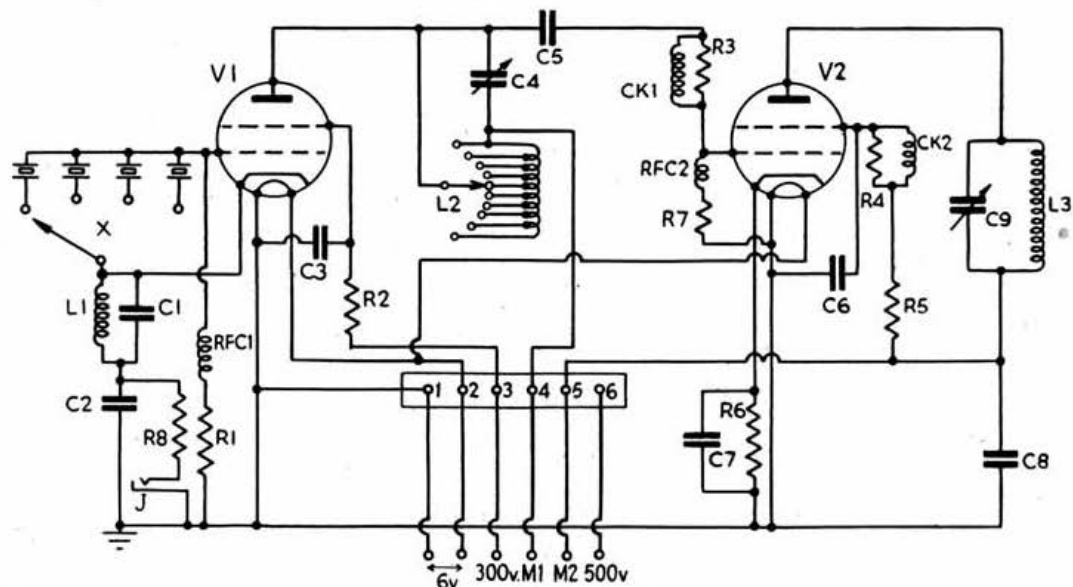


Fig. 1.
Circuit diagram with details of terminal panel connections.

Figures indicated on terminal strip are viewed—from left to right—in Fig. 2. A 0-100 mA. meter from "300 v. to M1" will read 6L6 anode current. A 0-150 mA. meter from "500 v. to M2" will read 807 anode and screen current.

C1, 5 } 100 μ F (ceramic or silvered mica type).
C2, 3, 6 }
C7, 8 }
C4, 9 } .01 μ F.
C5 } .0001 μ F.

R1 50,000 ohms 1 watt.

R2 10,000 ohms 1 watt.

R3, 4 100 ohms $\frac{1}{2}$ watt.

R5 16,000 ohms 5 watt.

R6, 8 500 ohms 5 watt.

R7 47,000 ohms 1 watt.

X Four-position crystal holder (Brookes).

RFC1, 2 Standard R.F. Chokes (resistor wound type).

CK1, 2 8 Turns 20 S.W.G. enamel (air wound over R3 and R4).

J Key jack.

L1 8 Turns 18 S.W.G. enamel on $\frac{1}{2}$ in. diameter form.

L2 19 Turns 16 S.W.G. tinned copper on 2 in. diameter former, and tapped (1154 tuner).

L3 14 Mc/s.—7 turns 18 S.W.G. enamel on $1\frac{1}{2}$ in. diameter former.

28 Mc/s.—4 turns 18 S.W.G. enamel on valve base.

V1 6L6 or 6V6 valve.

V2 807 valve.

proximity but in spite of this no unwanted coupling was experienced, even at 28 Mc/s. However, a metal 6L6 (or 6V6) would be preferable just in case of trouble in this direction.

HT, LT and meter connections are all made to the terminal strip at the back of the chassis and details are given in Fig. 1.



Fig. 2.
Top of chassis view of exciter.

Under-chassis components are all self-supporting with the exception of the cathode coil (L1) which is mounted on a small bracket and can be seen in Fig. 3. Grid and screen stoppers and chokes are used in the 807 stage and these can be clearly seen in the same photograph immediately under the 807 valve base.

To those contemplating the construction of this exciter a few words of warning are offered. Do not be tempted to omit the stoppers and chokes. The 807—excellent valve though it is—is inclined to perform T.P.T.G. activities on all sorts of illusive frequencies!

In using these valves in various circuits over the past six years the arrangement and values given here have proved highly satisfactory. Anode stoppers, and chokes, in the majority of cases, are not sufficient. These remarks apply equally to two 807's in push-pull circuits.

All fixed condensers used are either mica or metal cased 1,000 V. test type.

Keep all leads as short as permissible, and in order to get point-to-point connections use RF polystyrene sleeving as shown in Fig. 3. Earth leads should be of 16 S.W.G. tinned copper wire.

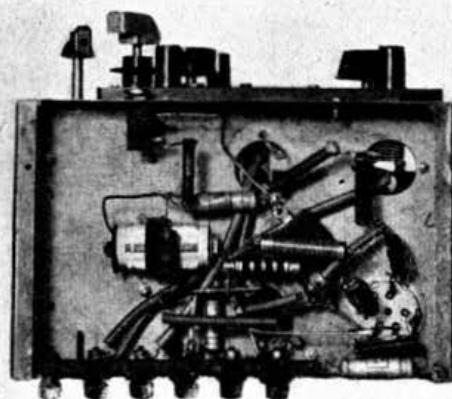


Fig. 3.
Underside of chassis. Note point-to-point wiring.

Power Supply Requirements

A 500 volt DC supply rated 150-200 mA. is adequate for the needs of this exciter. 500 volts are applied to the 807 stage and 300 volts—obtained via a suitable dropper or potentiometer—to the 6L6 oscillator. Two separate supplies may, of course, be used if desired.

A 6.3 volt supply rated at 2 amps. is required for the heaters.

Operation

For the benefit of those constructors who use the 1154 tuning unit as described, the following stud positions will serve as a guide in setting up the tritet stage. It should be noted that the positions given will only apply when the HT is fed to the "panel end" of the inductance.

There are nine studs on the panel. Taking the top stud as No. 1—for 7 Mc/s. use stud No. 8, 14 Mc/s. stud No. 4, 21 Mc/s. stud No. 5. The output on the latter frequency is, of course, much less than that obtained on 14 Mc/s.

The 6L6 anode current dip reading should be about 15 mA. at 7 Mc/s. and 25 mA. at 14 and 21 Mc/s.

The anode and screen current dip reading for the 807 should be about 30 mA. at 7 Mc/s., 40 mA. at 14 Mc/s., and 60 mA. at 21 Mc/s. As already mentioned the 21 Mc/s. output from the 7 Mc/s. fundamental will be rather inefficient but the figures are included as a matter of general interest.

The exciter may be coupled to an RF amplifier by capacity or link coupling as desired.

Some tests were conducted with the 807 working as a buffer on 7 Mc/s. (using a 7 Mc/s. coil in this stage) and contacts were made on 14 Mc/s. with the aerial coupled to the 807 working as a doubler. Under the latter conditions the input was just 30 watts i.e. 500 volts at 60 mA.

With a suitable high-grade condenser connected in parallel with L2—and an appropriate crystal—the tritet oscillator could be made to work on 3.5 Mc/s. with the 807 working as a buffer on this frequency or, as a doubler, on 7 Mc/s. Time did not permit the writer to carry out this further modification but it should work quite well. For regular use the additional capacity could be arranged in a switched circuit.

AFFILIATED SOCIETIES

The following Societies and Clubs have been granted affiliation or have renewed their affiliation with the Incorporated Radio Society of Great Britain since the list of Affiliated Societies appeared in our June issue :—

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BRADFORD AMATEUR RADIO SOCIETY, c/o Mr. W. Sykes, 66 Little Horton Lane, Bradford, Yorks.

CAMBRIDGE UNIVERSITY WIRELESS SOCIETY, c/o Mr. K. Machin, 129 Mowbray Road, Cambridge.

COURTAULDS AMATEUR RADIO GROUP, Foleshill Road, Coventry, Warwickshire.

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NORTH-EAST AMATEUR TRANSMITTING SOCIETY, c/o Mr. J. W. Hogarth, 4 Fenwick Avenue, Blyth, Northumberland.

PRESTON RADIO SOCIETY, c/o Mr. J. Brindle, Marlow Cottage, Preston Junction, Nr. Preston, Lancs.

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SIMPLE METHODS OF OBSERVING SUN-SPOTS

By A. HARCUS CUTT, A.R.P.S. (GM2BGH).*

NO apology is required nowadays for the inclusion in a radio journal of an article on sun-spots.

All wireless men take for granted that when there is a crop of sun-spots they can look out for freak conditions, especially on the higher frequencies. Note the words—take for granted—for very few amateurs take the trouble to examine the sun for themselves. They rely on reports in the press. The daily press is more given to sensationalism than to accuracy, and of course there is apt to be a long delay before reports appear in the technical press. Possibly there is a feeling that the task of observing sun-spots is the prerogative of astronomers, and requires special skill and elaborate apparatus. Nothing could be further from the truth. This short article is not concerned with theory, but is merely intended to show how very easy and fascinating it is to make elementary observations of the sun. The writer does not pretend to be an astronomer, but his simple equipment has given him a good deal of pleasure and instruction, and has widened his horizons very considerably.

When sun-spots are exceptionally large it is quite possible to see them with the naked eye, especially when the sun is low and screened by a haze. Chinese records dating back prior to A.D. 200 do not merely record the observation of spots but in some cases describe their shapes. Even the simplest binoculars or telescopes are of course a great advance on the unaided vision. The writer saw his first sun-spot 25 years ago, quite by accident, using a very simple home-made telescope of the Galilean type when the sun was setting in a dense haze. The instrument in use at present is a 3" refractor which was purchased second-hand for the modest sum of £5. Similar bargains in slightly old-fashioned glasses can often be obtained, due to the fact that although amateur astronomy was a popular craze about 50 years ago its devotees are now comparatively few.

On no account should an unscreened glass be pointed at the sun. There would be grave danger to the eyesight because of the intense heat. It is common knowledge that an ordinary magnifying glass can be used to set fire to paper. The front lens (or objective) of a telescope collects heat in a similar fashion. In fact a large telescope will crack a piece of dark glass placed over the eyepiece.

Methods in General Use

Several methods are in use for observing sun-spots. The professional method is to photograph the sun on a scale of about 9", using in most cases a glass of about 3" to 5" (diameter of objective). Continuous records of this kind are kept by observatories in various parts of the world, including Greenwich. By the use of the spectro-heliograph it is possible to photograph not merely the visual aspect of the sun but to separate the various atmospheres. This is, of course, beyond the scope of the ordinary amateur.

For small glasses up to about 1½" diameter—e.g. marine glasses and signalling telescopes—all that is needed is a filter glass fitted over the eyepiece. The most usual colour is deep red, but this is a great strain on the eyes. If possible it is much better to use a neutral tint or green. Test the filter before trying it on a telescope. If it is dark enough you

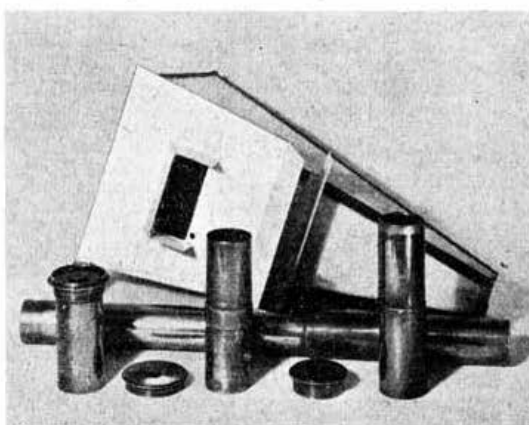


Fig. 1.
TELESCOPE AUXILIARY APPARATUS.

Back : Cardboard cone for observing sun. The long tube lying on its side is the draw tube fitted with inverter lens system. Front (left to right) : High power eye-piece. Sunshade for same. Short draw tube to take either eye-piece (inverted image). Push-on eye cap. Low-power eye-piece.

should be able to see nothing through it but the sun, or the filament of an electric lamp. Take no risks.

Larger telescopes may of course be used with an eyepiece filter, but in this case an additional protection known as a Solar Diagonal should be used. This is really an unsilvered mirror with a plane surface, and is usually made in the form of a thin prism to avoid double images due to reflection from both front and back surfaces. Instead of viewing the sun direct it is viewed by reflection from the Diagonal, which cuts down the heat and light to less than one-sixteenth their original values.

Projection Method

For casual observations, where it is not desired to examine the fine details of the spots but merely to

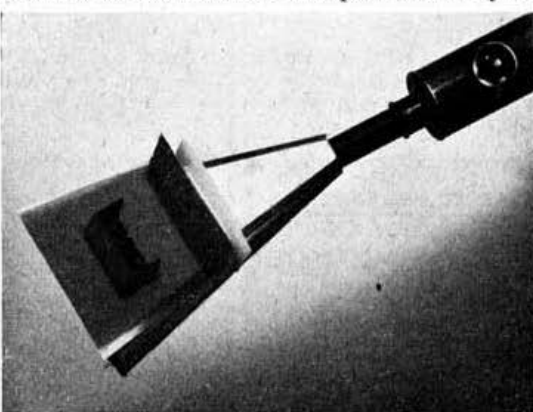


Fig. 2.
OBSERVING CONE FITTED TO 3IN. REFRACTOR TELESCOPE. The cardboard cone is 12in. long and the large end (viewing screen) is 6in. x 6in. The photograph shows the hooded viewing aperture (towards larger end), and also the light baffles fitted to the outside to avoid dazzle and light leakage which would spoil brilliance of image. The rear half of the side containing the aperture is hinged to allow the insertion of cards for recording the position of sunspots.

* 4 *Auchentrae Crescent, Ayr.*

note the sizes and positions, the writer much prefers the Projection Method. This can easily be tried out by holding 'up a white card a short distance behind the eyepiece of the telescope. If the focusing rack or draw-tube is now extended a little beyond the usual visual position a clearly defined image of the sun will be projected on to the card. With a given objective and eyepiece the sun's image is increased by holding the card further from the glass. The writer's 3" refractor, when fitted with an X40 eyepiece, gives an image of about 3" diameter when a card is held 10" behind the eyecap. On this scale a good deal of detail can be seen. The dark centre of a spot shows up clearly, surrounded by the feathery shading of the penumbra.

Supporting the Telescope

It will be evident that some form of stand is almost essential. The simplest type of "pillar and claw" tripod will be quite useful, but for serious work even with a small telescope it is worth while fitting up a sturdy stand. This must permit the glass to be pointed in any direction, and it is important that the movement should be well balanced so that the glass will remain in position. Of course the ideal equipment for the wealthy enthusiast is an equatorial mounting fitted with a driving clock so that the telescope automatically follows any celestial object at which it is pointed. For the present purpose a simple tripod fitted with a rotating and tilting top is all that is needed.

Observations

To use the projection method in comfort a small fitment should be made-up to hold the viewing card at a suitable distance behind the eyepiece and also to screen it from all extraneous light, which will otherwise prevent the image from showing up brilliantly. This fitment can be made in the form of a cardboard cone, glued together and the edges taped. A viewing aperture should be cut in one side, and it is useful if one side can open for the insertion of special cards, marked with the solar meridians and parallels, to record the exact positions of the spots. The inside can well be painted with some preparation such as *Johnson's* dead-black (obtainable at any photographic dealers). The viewing card should be smooth and as dead white as possible. A coating of fine plaster of paris is very good, but even a piece of Bristol Board will do.

If this article encourages anyone to do a little sun-gazing he will find the effort well worth while. This is not the place for talking of other attractions of astronomy, but information can easily be obtained from the *British Astronomical Association*, which fills a similar position in astronomy to that occupied by the R.S.G.B. in radio.

SECOND ANNUAL

AMATEUR RADIO EXHIBITION

TO BE HELD AT

THE ROYAL HOTEL

WOBURN PLACE LONDON

W.C.1

NOVEMBER 17th to 20th 1948

The Event of the Year

American Publications

We are glad to be able to announce that the Society has again been authorised by the Board of Trade to import single copies of U.S. technical publications through the post.

Members may now forward orders for the following publications:—

A.R.R.L.

Radio Amateurs' Handbook, 12s. 6d.

QST, £1 6s. per annum.

EDITORS & ENGINEERS, LTD.

Radio Handbook, 17s. 6d.

Radio Antenna Manual, £1.

RADIO MAGAZINES, INC.

Audio Engineering, £1 1s. per annum.

CQ, 17s. 6d. per annum.

All prices include postage, and delivery can be expected about 4-6 weeks from date of order.

Radio Amateurs' Examination Courses of Instruction at Ilford

With reference to the announcement which appeared in the July issue regarding courses of instruction in preparation for the Radio Amateurs' Examination, we understand that students may enrol between 7 p.m. and 9 p.m. on any evening during the period, September 6 to 9. Enrolment will take place at the Literary Institute (County High School for Girls), Cranbrook Road, Ilford. The course will commence on September 15.

The full syllabus has not yet been issued to the public but as soon as this becomes available it is probable that a number of non-members will make application for enrolment. In view of this, those who have already submitted their names to Mr. C. H. L. Edwards, G8TL, should enrol on either September 6 or 7 to ensure acceptance. Those who apply later may find the lists closed.

Members living or working outside the County of Essex must obtain permission to enrol from their local Education Authority before they can be admitted to the course. Provided written permission has been obtained out-County students will be accepted at the County fee of 5s. for the complete course, unless a local Education Authority has determined otherwise.

Mr. Edwards, whose address is 10 Chepstow Crescent, Newbury Park, Ilford, Essex, would be glad to hear from any member who has a copy of *The Amateur Radio Handbook* for disposal. Copies of this R.S.G.B. publication (now out of print) are urgently required by students who are enrolling in the courses of instruction referred to above. Condition is not important.

Ministry of Supply Surplus

Transmitter and Admiralty Electronic Scrap Schemes

Members who purchased surplus M.O.S. transmitters through one or other of the R.S.G.B. schemes are reminded that the following conditions of sale were imposed by the Ministry:—

"No set may be resold—prices quoted must be adhered to—sets must not be re-sold outside the Society."

During recent months advertisements have appeared in the *BULLETIN* and other Journals offering for sale a number of surplus Government transmitters—including the B2—at inflated prices.

It is to be hoped that these sets were not purchased under any of the R.S.G.B. schemes because if so purchasers are liable to have proceedings taken against them by the Ministry. The same remarks apply to Admiralty electronic scrap which was offered at 50s. per cwt. on condition that it was not resold except to members and then only at cost price plus carriage.

Members answering advertisements for surplus transmitters should insist upon seeing the original receipt.

BRUSH UP YOUR OPERATING

By R. YOUNG (G3BTP)*

MORE than ever before, present conditions on the amateur bands place a heavy premium on operating ability. For, while many stations are now equipped with comparatively high-power transmitters and multi-valve communication receivers, the excellent results achieved by certain enthusiasts using simple equipment should encourage every newcomer to pay particular attention to the one sure way in which—at no cost to himself other than regular practice and a little forethought—he can obtain increasingly satisfactory contacts and experience the real enjoyment which comes from smooth and fluent “brass pounding.”

The chief characteristics of a good operator are his ability to copy a weak signal through heavy interference and to send well-formed letters, accurately and rhythmically, irrespective of speed. The amount of practice necessary in order to acquire these characteristics is lessened by undertaking it in the correct way, and with these definite objectives in mind.

Reading through QRM

In view of the number of stations now active it may seem a little superfluous to suggest that additional practice in reading through interference is often desirable! Nevertheless, experience shows that improvement in this sphere comes more from conscious effort than from normal operating and the ear quickly responds to a little training. The human ear is a remarkably sensitive instrument capable of a high degree of discrimination and rapid adjustment to varying noise levels provided—and this is most important—it is not overloaded. When the volume is kept low, notes less than 100 cycles apart may be readily distinguished—a performance characteristic that would put many a modern receiver to shame!

So avoid overloading the ear by keeping all signals as quiet as possible. Then to improve discrimination choose a busy frequency and practice reading first one transmission and then another without retuning the receiver. Make a habit of doing this each day during those few minutes while the transmitter is warming up and it will not be long before you will find that an S3 signal can be read through much louder signals so long as a definite concentration is made on the pitch of the note.

Improving Speed

The surest system of increasing speed is to practice copying transmissions sent at several words a minute above the normal limit of your receiving speed. Since this is *not* the way to enjoy amateur contacts, a brief period should be set aside each day and devoted to copying commercial stations. Foreign language or coded texts will soon correct any tendency to “anticipate” the next letter, while regular listening to automatic sending improves the sense of rhythm. Remember that what matters is your ability to *copy* messages and not just to read them. Develop a clear writing style with each letter easily recognisable. Block printing has many advantages over script but requires more practice. Since the top speed of most experienced operators is limited more by their ability to get the messages down on paper than by the mental transcription involved, it follows that fast writing and blocking practice is time well spent.

Rhythmic Sending

The cultivation of a smooth rhythmic style of sending should be the aim of every operator. Try sending “Best bent wire best” a few times. It should have a marked lilt vaguely reminiscent of the old music hall songs. Strive to impart this lilt into all sending, for, when higher speeds are reached, it is the rhythm of a group of characters rather than individual letters that is read. Visualise each symbol as it would appear on the recording tape of an undulator and avoid the jerkiness and clipped style that result from a too-early attempt to increase speed at all costs.

For good, accurate, sending the straight key still holds its own but if you do succumb to the attractions of a semi-automatic key make sure that the new style is thoroughly mastered on practice circuits before endeavouring to use the “bug” on the air. But no matter what type of key is chosen, send “tape” Morse whenever possible. Admittedly, on rare occasions the “square dot” and “Baghdad” (long dash) styles have their advantages provided that the exaggerations do not reach the extent of the notorious “banana boat roll”!

When transmitting, know what you are going to send, and then send it, avoiding the long succession of break signs that characterise the operator desperately trying to think of something to say. Learn to appreciate the scope and flexibility of the complete “Q” code and not only the few popular symbols. But, at the same time, employ them with discretion and never just in order to impress other operators. Punctuation and commercial abbreviations are worth studying for use with those operators known to be “operating conscious.”

One last word to fellow users of the low frequency bands—please do not ignore the weaker signals. Apart from providing excellent operating practice, such contacts give genuine encouragement to stations with modest equipment as well as soon upsetting many preconceived notions as to the effective range of low power transmissions.

“The Top Band”

Members using the “top band” and especially those living in coastal areas are requested to take every precaution not to interfere with Government services operating between 1820 and 1850 kc/s.

Complaints of serious interference by amateurs to the North Foreland ship-to-shore service have been received by the Society.

R.A.F. Distress Frequency—3805 kc/s.

Although most British amateurs continue to take every precaution to avoid causing interference to the R.A.F. Distress Service on 3805 kc/s., it has been reported to the Society that certain European amateurs operate just above 3800 kc/s. and that a few British amateurs tend to set their V.F.O.'s on the frequency of these Continentals.

Again, we would urge all members who operate in the 3.5 Mc/s. band to avoid working on any frequency which may jeopardise the R.A.F. Distress Service.

Have you suppressed

YOUR

Motor Car?

* 48 Quaves Road, Slough, Bucks.

The Station Behind the Call

G6IF*

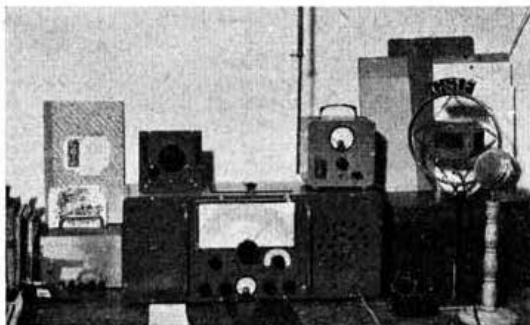


Fig. 1.—Receiving position at G6IF.

EVEN to-day when so much commercially-built equipment is available, the home-constructed amateur station possesses an especial appeal. It will be a sad day for Amateur Radio when receiving a package over the counter finally replaces the hours spent at the work-bench. But traditions die slowly and, when contacting stations in all continents, G6IF of Booker, near High Wycombe, has the added satisfaction of knowing that his results depend upon his own efforts with a screwdriver and soldering-iron. The accompanying illustrations show just how satisfactory have been these efforts whilst a glimpse behind the massive covers of the log-book would soon confirm that, in this case at least, general appearance provides a reliable pointer to the efficiency of a station.

Equipment

The transmitter follows conventional design. Either VFO or crystal control may be used with the output coupled to a 6L6G frequency multiplier

which is link coupled to a pair of PT15's in push-pull as power amplifier. For telephony, plate and screen modulation is effected by means of a pair of 6L6's delivering some 50 watts of audio and allowing a maximum input of 100 watts telephony compared to the full 150 watts for C.W. operation. By the use of a side door built in the transmitter rack and the careful lay-out of all R.F. coils, band changing is made relatively easy. This door (shown open) also makes possible the conserving of room space since the transmitter rack can be placed right against the wall. The entire equipment is controlled from the panel shown beneath the operating table and a band-switched monitor is mounted behind this panel. A cream finish adds considerably to the attractive appearance of the transmitting equipment.

The receiving apparatus is built in four units: superhet receiver, a 14 and 28 Mc/s. preselector (top left of the main unit), power supply and a 'phones/speaker switch panel. Separate oscillators are employed and coil changing is simplified by the small lid to be seen on top of the case. Each band more than covers the $9'' \times 4\frac{1}{2}''$ tuning scale and rigidity was the prime consideration in design, with the chassis of $\frac{1}{16}''$ brass and the panels of $\frac{1}{8}''$ brass. On the top right of the receiver is the field strength indicator with a small telescopic aerial.

Interference Suppression

The geographical position of the station, placed as it is on the fringe of the Alexandra Park television service area, makes the suppression of harmonic radiation a high-priority problem. G6IF is proud of his ability to run his full 100 watts on 14 Mc/s. telephony with absolutely no ill-effects upon television receivers less than 300 yards away. This "work anytime" achievement is largely due to the use of extremely loose aerial coupling.

But—television excepted—the location has many advantages. It is 500 feet above sea level with the aerial masts adding another 40 feet to the height. The aerial for all bands other than 28 Mc/s. consists of a 67' 6" radiator, fed at the centre with 600 ohm open line 70 feet in length. On 28,260 kc/s. a rotary dipole is brought into use.

Despite a late post-war start (November, 1947) a considerable number of DX contacts have been packed into the last few months whilst from 1932-39 G6IF was well-known for his transmissions from Leigh-on-Sea.

Eddystone 640 Receiver Essay Competition (Overseas Section)

In the opinion of the judges the most meritorious essay was that submitted by:—

Mr. W. G. Collett, 29A Duncan Street, Dunedin, New Zealand,

who chose as his subject *The Relative Merits of British and American Communications Equipment*.

The undermentioned competitors were also singled out for special recognition:—

Mr. C. Holmes, 37 Norwood Street, Beckenham, Christchurch, New Zealand—*The Relative Merits of British and American Communications Equipment*.

Mr. H. Owen, West African Cocoa Research Institute, Tafo, Gold Coast Colony—*Band Planning*.

The general standard of entries was high, but in the opinion of the judges (Mr. John Clarricoats, Editor R.S.G.B. BULLETIN, Mr. Austin Forsyth, O.B.E., Editor *Short Wave Magazine*, and Mr. Geoffrey Parr, Editor *Electronic Engineering*), those listed were outstanding as technical contributions on their respective subjects.

Mullard—Hallicrafter Agreement

In announcing last month the new agreement under which Mullard Electronic Products, Ltd., will manufacture Hallicrafter equipment, we omitted to state that all distribution of the equipment so manufactured in the British Isles, will be handled by Mr. Reg Adams, G2NO, through *McElroy-Adams Manufacturing Group, Ltd.*, of 46 Greyhound Road, W.6.

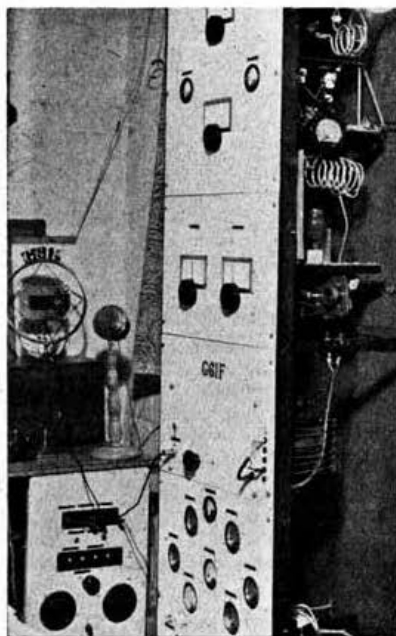


Fig. 2.
Close-up view of the transmitter in use at G6IF with wide door removed.

*M. E. Tapson, 5 Squirrel Lane, Booker, High Wycombe, Bucks.

THE MONTH ON THE AIR

By A. O. MILNE (G2MI)*

FORTHCOMING R.S.G.B. CONTESTS

- | | |
|-------------|--------------------------------------|
| Sept. 4-5 | Five Metre Contest (Second Section). |
| Sept. 20-25 | Low Power Contest. |
| Sept. 26 | Five Metre Field Day. |
| Nov. 27-28 | Top Band Contest. |

Phone and C.W. Bands

It is interesting to note the progress being made in our efforts to persuade 'phone and CW operators to keep to separate parts of the bands. A survey of the bands will reveal that the first 50 kc/s. of 3.5 Mc/s., the first 100 kc/s. of 14 Mc/s. and the first 100 kc/s. of 28 Mc/s. are now practically free of telephony. The second 50 kc/s. of 3.5 Mc/s. are all but clear as is the portion of the band 14,100 to 14,150 kc/s. Some progress is being made towards persuading, by example, those CW operators who use 14,150-14,200 to move down the band. Likewise very few amateur CW operators can now be heard in the "phone" section of 3.5 Mc/s. Just as the use of the R.S.T. code became general merely by common consent, so our troubles in this matter of band planning seem to be solving themselves likewise. Don't immediately write in and denounce someone who does not conform! These things take time but progress is so good that official band planning looks like being unnecessary if things improve at the present rate. In fact it is more common to hear CW in the phone bands than the reverse. It is just another case of "gently does it" with British good example leading the way. Keep up the good work!

D.C. Mains

A suggestion has been put forward that amateurs on D.C. mains might like to exchange notes on how they have overcome this handicap. There is a widespread belief that Amateur Radio just is not worth while if there is no A.C. available but a recent visit to the Isle of Thanet has shown how mistaken this belief really is. Several highly efficient stations are in operation in this D.C. area and it is possible that in a number of places throughout the country others are to be found. Should you be interested in forming a D.C. Mains Study Group with the object of exchanging ideas and providing an article or two for the BULLETIN, please send a postcard to G2MI bearing your name, call and address and the words "D.C. Mains." Nothing more please.

Empire DX Certificate

It is evident that a number of members are still under the impression that only post-war contacts count for the Empire DX Certificate. This is not so. Both pre-war and post-war contacts count, so have another look at your cards.

Notes and News

G6KS forwards a list of calls to look for if you are interested in W.A.S. All the following are active on 14 Mc/s. CW and those starred have already QSL'd Arizona W7UW, Idaho W7ITN*, New Mexico W5FKP*, W5AFU, W5KWP, Wyoming W9LMG/7*, W7HRM*, S. Dakota W9CJS*, Nevada W7ONG*, W7CTK*, Montana W7CJB.

G3BBG has worked M1B on 7,110 'phone, says he will QSL. Does not speak much English. G6KU forwards a request from VP6CDI that G stations should call him a few kilocycles off his frequency. HB9CE reports YA5B as Box 5 Kabul. We'd like to see a card, bearing Afghan stamps! He also tells us that OX3WC is on Canalia Is. and asks for QSL's via E.D.R. Copenhagen. G2FYO is another emigrating G. He will shortly be living in Beverly Hills, California, and will be heard on W6MBD on 14 and 28. V87WN uses only 15 watts and is getting up to date with his QSL's. He will be returning to this country soon. ZE2JO will be QRT by the time this is in print. Better known as G2CKM and later as VQ4MNS, he is moving to Northern Rhodesia. The new call will be VQ2MS.

BRS17274 reports what appears to have been a Russian contact with all the U stations calling WSEM. Says SL5AB is a Swedish Army signals station in Stockholm. He has recently logged VR6AB. Another BRS member, 16304, has been specialising in Y8 signals. What a collection! There will be a spate of early risers for the 0500-0600 G.M.T. period to meet Y83PL, Y81AC, Y82AG, Y81GM, Y81RM and HR1CE1. This latter has been worked by G2MI and G8IG on 14,120 'phone.

G3CMH says OX3BD will soon be QRT. Please QSL to Box 1316, Gastonia, N.C. W4NCM/MM is Captain of the s.s. *Gulfland*, c/o Gulf Oil Corp., Marine Dept., Philadelphia, Pa. IS is the new prefix used by Sardinian stations. Sorry for a

slight slip last month—TA3AFS should read TA3FAS. He QSL's. XG6AJ is quite genuine in Muscat. QSL via R.S.G.B. G3DEZ/AP worked by G6CL awaits his AP call.

G6RH has worked UMSKAA, a T6 note on 14 Mc/s. at 1750 G.M.T. for completion of a Worked All Russian Zones effort! Other items from his bag are ZD1AS, 14105 T9 HC7KD 'phone 14170 TA3FAS 'phone 14170 and MD4JG 'phone 14150.

A correspondent in the United States points out that the address Derby Lane, Vt., given recently for the Gatti Hallcrafters QSL's should be Derby Line. TINS/MD2G has returned to G and has QSL'd 100 per cent. His QTH is 9, Victoria St., Torpoint, Cornwall.

G1WQ recently worked VK3MC on 7 Mc/s. The VK gave his QTH as Coleraine. Bob thought his leg was being pulled as his business address is Coleraine, N.I. The card has come in, however, from Coleraine, Victoria.

ZC1CL has been making some observations on YA3B and agrees with us that he is a "phoney." CL is shortly taking a portable rig to Kuwait. He will use a special card and a full list of QSO's will be sent to the R.S.G.B. and A.R.R.L. Just to guard against the enterprising gents who send along cards for QSO's which never took place! ZDSB also complains of this sharp practice. Give us the calls and we'll publish them. Doesn't it make you sick?

Yes, O.M. VS9GT counts separately for EDX and DXCC. So does VS9ET—his predecessor.

W6AY gives CSYCW as Box 73, Lanchow, Kansu Province, the same as CSYK, who has now gone to Nanking. CSLS is another genuine one in Zone 23. Jim gives it as his opinion that the G's are "tops" for QSL's. Out of a total of 211 contacted, he has already received 167 cards, a 79 per cent. return. He says it compares very favourably with the 52 per cent. return from W's.

Apologies to Ken Jowers for our reference to ex-G5ZJ. He still holds his G call although now active as AP2J.

Almost all amateur radio has been stopped in Burma. The new freedom!

Malta

Members of the Malta Amateur Radio Society will extend a warm welcome to any amateur visiting the island. Phone Shema 1551 and ask for Mr. F. Hague, ZB1AH, the president.

Hongkong

H.A.R.T.S. is flourishing again and the following calls have been issued:—VS6AB, C, D, E, F, J, K, L, M, P, R, S, V, W, X, Z and VS6BA, BC according to G5CL. VS6AW offers a few QTH's, C7TK Kiang, Box 52, Peiping, and CSYR Box 73 Lanchow, Kansu, in Zone 23. Says he has had no QSL from C6HH yet. (Cards have arrived at the bureau.)

Palestine

Will all former holders of ZC6 calls please send envelopes to the Bureau? A nicely autographed photograph of Jane Russell awaits ZC6JJ!

The W.A. VE: Certificate

So that there shall be no confusion, VE3BWY tells us that to qualify for this certificate two contacts with every VE call district must be verified. The two contacts in each district must be on different bands. For the purposes of this award, VE1 has been split into three districts, New Brunswick, Nova Scotia and Prince Edward Island. Thanks to G2DHR for passing on the information.

Postscript

Anyone who logged G2MI/P during the period June 26th to July 12th is sure of a QSL provided full and useful details are given. Input was 1 watt to a 3D6 oscillator. Aerial 75 ft. long and about 15 ft. high. Transmissions were made on both 1.7 and 3.5 Mc/s. Phone and CW. Best DX so far 120 miles.

Personal

Finally a word of grateful thanks to Bert Allen, G8IG, for his stout effort last month. Many kind enquiries have been made by correspondents regarding my holiday. The less said the better! At any rate although the weather was foul, at least I did not have to worry about M.O.T.A. Thanks, chaps.

FOR TRANSATLANTIC PHONE
CONTACTS USE FREQUENCIES
BETWEEN
14,300 AND 14,400 KC/S

* 29 Keshill Gardens, Hayes, Bromley, Kent.

NATIONAL FIELD DAY, 1948

EDGWARE-HENDON THE WINNERS—SOUTHGATE RUNNERS—UF

THE number of logs received and the excellent scores made by field stations using only 5 watts proves beyond all doubt the success of the first post-war low power N.F.D.

The winning stations, G3HT/P and G2IM/P (Edgware and Hendon), with a combined score of 774 are to be congratulated on their fine performance.

The "A" Station, G3HT/P, used a VFO-BA/FD-PA transmitter with a dipole for 1.7 Mc/s. and two dipoles for 3.5 Mc/s. Receivers were an HRO and an AR88. The "B" Station, G2IM/P, used a 6V6-6V6-6L6 combination with crystal or VFO drive, feeding a two element rotary beam or two dipoles for 14 Mc/s. or two dipoles for 7 Mc/s. Receivers were an AR88 and an SX28. Both stations obtained power from petrol driven alternators.

The runners-up were Southgate—last year's winners—with G5FA/P and G2DHR/P. The "A" station, G5FA/P, consisted of a Franklin-BA-807 PA feeding one of two 1.7 Mc/s. half wave aerials, and powered by a battery driven rotary converter. An HRO receiver was used. The "B" Station, G2DHR/P, used a Franklin, doublers and VT501 PA feeding two half wave dipoles or a long wire. Power was obtained from batteries and rotary converter. The receiver was an AR88.

The leading "A" station, G3FJ/P, of Slough, with a score of 423, used an MO-BA/FD-807 PA combination feeding a 270 ft. long wire. The receiver was a modified R107.

The leading "B" station was G2IM/P, already described.

With somewhat indifferent weather, which, at times, made operating extremely uncomfortable, the performances put up by the majority of stations were really excellent.

Stations operating on 14 Mc/s. found conditions good, with W's providing most of the scoring. All W districts, CO, KZ, LU, VE, VK, VP9 and ZL were worked.

The use of beam aerials on the 14 Mc/s. band brought a little criticism, but it is thought that if a group have sufficient enthusiasm to construct one, they should not be debarred, for after all, the modern trend is towards the use of such systems, and it should be remembered that some stations have good sites, whereas others may not be so fortunate, and the use of a beam may help to smooth out this difference.

The Contests Committee would like to thank and congratulate all who took part in this contest, which has proved to be one of the most popular of the season's events. Thanks also go to the following stations who sent in useful check logs: E13G/P, 6F/P, 6J/P, 8L/P, F9DW, G2AK/P, UX/P, G3AAR, ACC, AGQ, AZD, G3CFW, CJO, DCU, VF, G4AR, G5LP, QU, G6CL, RC/P, UT/P, ZN/P, G8LO/P, PF, GM3BCD/P, PA0CC/P, OTOM, OXE and ZL4GA.



ONE OF THE WINNERS.

Personnel at the Hendon-Edgware B Station which operated under the call G2IM/P. Left to right: G2QY, G6SB, G5FG, G2AHC, G2IM and G3LT. G2AJ, G2QY, G2IM and G5FG were the operators, G2AHC and G6SB, the Technical Staff; G3LT the Chief Catering Officer, and G4KD Camp Commandant.

Psn.	Town or Area.	"A" STATION.		"B" STATION.		Combined Score
		Call Sign.	Pts.	Call Sign.	Pts.	
1	Edgware and Hendon ..	G3HT/P	333	G2IM/P	441	774
2	Southgate ..	G5FA/P	324	G2DHR/P	369	693
3	Slough ..	G3FJ/P	423	G6CJ/P	258	681
4	Cambridge ..	G6UW/P	391	G8PB/P	281	672
4	East					
5	Molesey ..	G8SM/P	335	G6NB/P	337	672
6	Bristol ..	G5YK/P	276	G6YA/P	385	661
7	Sheffield ..	G3FN/P	312	G5TO/P	337	649
8	Coventry ..	G6TD/P	319	G2LU/P	318	637
9	Boston ..	G6GH/P	323	G2BQC/P	299	622
10	Aberdeen ..	GM6LG/P	252	GMSAT/P	366	618
11	Cheltenham	G6ZQ/P	246	G8LB/P	360	606
12	Nottingham	G6CW/P	285	G8QZ/P	319	604
13	Huddersfield	G8NF/P	368	G2BMC/P	231	599
14	Croydon ..	G2FWA/P	217	G6LX/P	381	598
15	Bromley and Beckenham	G6HD/P	337	G4AU/P	235	572
16	Chingford ..	G8JM/P	350	G3YF/P	215	565
17	Brentwood ..	G2CIW/P	255	G4AK/P	299	554
18	Bury ..	G2GA/P	261	G3BRS/P	282	543
19	Northern Ireland ..	G12HLT/P	260	G15UR/P	279	539
20	Leicester ..	G6VD/P	280	G3BU/P	253	533
21	Farnham and Farnborough	G5US/P	276	G8TS/P	248	524
22	Cardiff ..	GW5BI/P	209	G8SUH/P	305	514
23	Neath and Port Talbot	GW2FRB/P	306	GW4NZ/P	200	506
24	Sutton and Cheam ..	G2CZH/P	275	G2JB/P	212	487
25	Chelmsford	G5RV/P	271	G2HPP/P	214	485
25	North Angus	GM3KC/P	187	GM6RI/P	298	485
27	Burnley ..	G8TD/P	218	G3SJ/P	263	481
28	Edinburgh ..	GM6JH/P	156	GM3HX/P	324	480
29	Oakham ..	G2HDU/P	286	G3AEC/P	191	477

Psn.	Town or Area.	"A" STATION.		"B" STATION.		Combined Score
		Call Sign.	Pts.	Call Sign.	Pts.	
30	Exeter and Torquay ..	G5QA/P	176	G2GK/P	295	471
30	Loughborough ..	G4BI/P	222	G4MM/P	249	471
32	Gloucester ..	G3MA/P	235	G2RT/P	220	455
33	Scarborough ..	G2CP/P	183	G8KU/P	271	454
34	Kirkcaldy ..	GM4GK/P	248	GM4FK/P	199	447
35	Falmouth ..	G8AW/P	199	G6LV/P	237	436
36	Ipswich ..	G2AN/P	258	G8MU/P	177	435
37	Coulson ..	G2DN/P	201	G2KU/P	233	434
38	Rugby ..	G8RL/P	275	G8VN/P	158	433
39	Berwick ..	G3AFL/P	147	G6UC/P	278	425
40	Bolton ..	G2BTO/P	164	G3AOW/P	257	421
41	Reading ..	G6WO/P	269	G8RS/P	151	420
42	Hayes ..	G2RF/P	200	G3BWC/P	217	417
43	Dumbarton-shire ..	GM2FQG/P	163	GM3AHQ/P	248	411
44	Darlington ..	G2GC/P	187	G3DT/P	223	410
45	Brighton and Hove ..	G3WR/P	204	G3YY/P	196	400
45	Glasgow ..	GM8MJ/P	168	GM6IS/P	232	400
47	Abergavenny ..	GW8CT/P	194	GW2BG/P	203	397
48	Jersey ..	GC8NO/P	159	GC3GS/P	234	393
49	Derby ..	G8RB/P	167	G5YY/P	232	390
50	Bradford ..	G3APV/P	133	G2UY/P	253	386
50	Oswestry ..	G2AUZ/P	173	G2NX/P	213	386
52	Welwyn and St. Albans	G5UM/P	258	G4GT/P	126	384
53	Oxford ..	G8PX/P	176	G5RP/P	207	383
54	Dulwich and New Cross	G3CU/P	231	G2FKZ/P	150	381
55	Lowestoft ..	G2YU/P	206	G2CPL/P	173	379
56	Bournemouth ..	G2DBF/P	135	G3AYG/P	241	376
57	Liverpool ..	G8DI/P	178	G8AZ/P	188	366
58	Southend ..	G6CH/P	158	G5QK/P	191	349
59	Stroud ..	G5HC/P	196	G5WA/P	148	344
60	Wirral ..	G2AMV/P	209	G8BM/P	133	342
61	Kingston-upon-Hull	G2XA/P	194	G2KO/P	146	340

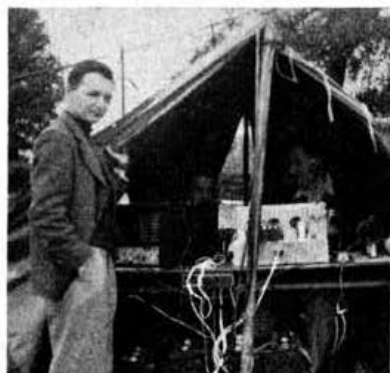
Psn.	Town or Area.	"A" STATION.		"B" STATION.		Combined Score
		Call Sign.	Pts.	Call Sign	Pts.	
62	Medway	G6NU/P	68	G5FN/P	261	329
63	Ilford	G8TL/P	158	G2QI/P	169	327
64	King's Lynn	G3IP/P	74	G2JS/P	250	324
65	North Kent	G4MB/P	208	G2CXO/P	112	320
66	Mansfield	G8HX/P	258*	G3APY/P	319	319
67	Middlebrough	G6ZT/P	169	G3CBW/P	148	317
68	Worthing	G3DZF/P	313	—	—	313
69	Hoddesdon	G5HO/P	65	G4HJ/P	247	312
70	Southampton	G3KJ/P	185	G5LR/P	126	311
71	Plymouth	G3TX/P	92	G5ZT/P	204	296
72	West Cumberland	G3BMZ/P	153	G6WR/P	134	287
73	Guildford	G6NA/P	210	G2ANT/P	76	286
74	Darwen and Blackburn	G2HW/P	284	—	—	284
75	Grimsby and Cleethorpes	G8KH/P	276	—	—	276
76	Stourbridge	G2NP/P	122	G8GF/P	153	275
77	Manchester (North East)	G8QS/P	164	G3RP/P	107	271
78	Great Yarmouth	G3AMK/P	174	G3CFK/P	90	264
79	Sunderland	—	—	G3CSR/P	258	258
80	Bedford	G5PA/P	256	—	—	256
81	Rochdale	G3BPZ/P	168	G2HBJ/P	74	242
82	Dorking and Leatherhead	G3AEZ/P	239	—	—	239
82	Worcester	G8JC/P	239	—	—	239
84	Chippenham	G3BTS/P	231	—	—	231
85	High Wycombe	G8JK/P	122	G4NT/P	102	224
86	Tonbridge and Tunbridge Wells	G4FB/P	216	—	—	216
87	Luton	G3QG/P	131	G5RZ/P	84	215
88	Preston	G2NY/P	207	—	—	207
89	Northumberland	—	—	G3CYY/P	200	200
90	Blackpool	G5WM/P	199	—	—	199
91	Eastbourne	G4OC/P	184	—	—	184
92	Finsbury Park	G2BAB/P	60	G8PP/P	105	165
93	Stockport	—	—	G2BJT/P	163	163
94	East Ham	G2ZZ/P	158	—	—	158
95	Cannock Chase	G3CLR/P	152	—	—	152
96	North Devon	G6GM/P	145	—	—	145
97	Dunfermline	—	—	GMSKR/P	128	128
98	South Shields	G3DDI/P	127	—	—	127
99	Birmingham (South)	G3LN/P	67	G5JU/P	58	125
100	York	G5WZ/P	39	G5KC/P	48	87

* Mansfield "A" Station disqualified. Entry received late. Score as claimed, unchecked.

Overseas Logs

Entries received from overseas portable stations appear below with the total points which they contributed to British portables operating in the event:—

Station.	Points.	Station.	Points.
E16J/P ..	212	E13G/P ..	140
E18L/P ..	188	E16F/P ..	36
PA0CC/P ..	161		



RUNNERS-UP.

Southgate (North London) last year's winners, were runners-up with a score of 693. The photograph shows their B Station with G6ZO (inside tent on right) operating the controls.



Photo. N. E. L. Phelps, 46, Stag Leys, Ashted.

The 14 Mc/s. two-element beam built and erected by G2AYC, President of the Sutton and Cheam Radio Society, and used by the Sutton B Station during N.F.D.

Five Metre Field Day

In response to many requests, an additional Five Metre Field Day has been arranged for September 26, 1948.

Rules

Intending entrants are referred to the Rules of the July Field Day published in the May, 1948, issue of the BULLETIN (p. 224).

The only amendments are as follows:—

- The event will commence at 10 a.m., September 26, 1948, and conclude at 6 p.m., September 26, 1948.
- Completed entry forms must be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, and must bear a postmark not later than Monday, October 4, 1948.

Five Metre Contests (First Half)

In the account of this contest, published in the April BULLETIN, reference was made to a station in the London area losing points for a contact made after the end of the contest.

Mr. Clark, G5PY, the only station listed as being in London, wishes it to be known that his is not the station concerned.

The Contests Committee hopes that members will not have construed the term "London area" as identical with "London."

Result of Five Metre Field Day

The following is a list of those who competed in the Five Metre Field Day on July 4, 1948, together with their scores.

Psn.	Call Sign	Location	Score
1	G2AJ/P	Farle Beacon, Sussex.	315
1	GW4OS/P	Nerquis Mountain, Flintshire.	294
2	G6XM/P	1 mile S.W. Aldershot, Hants.	260
3	GW4LU/P	Llechrydan Hill, Denbigh.	207
4	G4NT/P	2 miles N.E. High Wycombe, Bucks.	191
5	G3PZ/P	Mayhill, Herefordshire.	183
5	G5MA/P	1 mile S. Storrington, Sussex.	183
7	G6NB/P	4 miles N.W. Woking, Surrey.	174
8	G3MY/P	Houndkirk Moor, Derbyshire.	167
9	G3BWS/P	2 miles S.W. Chatham, Kent.	152
10	G5BM/P	Leckhampton Hill, Glos.	149
11	G3BEX/P	Devil's Dyke, Sussex.	125
12	G6YU/P	Keresley, Warks.	113
13	G2ZV/P	Ivinghoe Beacon, Bucks.	100
14	G3HW/P	2 miles N. Teignmouth, Devon.	98
15	G8SK/P	Arkley, Herts.	86
16	G3PB/P	7½ miles N. Glasgow.	84
17	G2FKZ/P	One Tree Hill, Dulwich, London.	79
18	G2DRD/P	Huntingfauld Farm, Forfarshire.	69
19	G2HDJ/P	2 miles E. Thrapston, Northants.	51
20	G3BND/P	Hartshead Pike, Ashton, Lancs.	47
21	G2DHV/P	Blackheath Common, Kent.	9

The following are thanked for check logs: G2UJ, 3BLP, 3BVU, 4MR, 50J, 5VM, 6CJ, 6HD, 8LY, 8NV/P, BR515836.

* Not eligible for award—member of Contests Committee.

AROUND THE VHF's

By W. H. ALLEN, M.B.E., G2UJ.*

The Five Metre Field Day

THERE is little doubt that entries for this event would have been greater had the weather on July 4th proved more favourable but despite heavy rain and high winds, those who took part thoroughly enjoyed their day out.

As will be seen from the results of the contest, given elsewhere in this issue, GW40S/P put up the highest effective score, being surpassed only by G2AJ/P operating from Firls Beacon, Sussex, whose membership of the Contest Committee disqualifies him from winning. Bad weather lost the Welsh station three valuable hours of scoring time, and but for this severe handicap there is no doubt that his performance would have been even more outstanding. As it was, it included 12 contacts over 100 miles, with 2AJ/P as his most distant QSO, followed by 3BLP, 5WP, 6NB/P and 6VX. GW40S/P constructed a special transmitter for the occasion employing button based valves in all stages, with a pair of 6C4's in push-pull feeding a 3-element beam.

G2AJ/P, with an 832 in the final and a close spaced 4-element beam, apart from his contact with GW40S/P at 210 miles worked 5MQ and 2BMZ. G6XM/P, near Aldershot with a 4-element "plumbers' delight" beam fed from an 832 P.A., worked GW4LU/P (Denbigh), at over 150 miles, and among his more than 60 contacts numbered 6LQ (Cheddar) and several stations in the Coventry area.

G8NV/P was situated at a badly shielded site at Redruth, Cornwall, which undoubtedly mitigated against G contacts, of which 3AUS, 3HW/P and 5BY were the only ones. He heard 2ADZ, AJ/P, XW, 3PZ/P, 4XT/P and 5MQ. During the several bursts of sporadic E conditions which enlivened proceedings from 1100 GMT onwards, 8NV/P worked several European stations including DA5FF, LA7U and OZ7G, and heard phenomenally loud signals from OK, PA0 and SM.

Contacts were effected from portable stations in various parts of the country with D, F, HB9, 11, LA, OE, OK, and PA0. F8HII was not worked, although he was putting in a first class signal on about 58.5 Mc/s. during part of the morning.

Altogether a most interesting day, and although G-DX conditions were only fair, it offered great possibilities for seekers after new counties, stations being active in Hereford, Cornwall, Flint, Denbigh, Derby and Forfar. The latter would appear to be the obvious northern end of a future G-DX record.

HB9AT, 11AY, OK1FF, 2HX, 2MV and PA0HA. G15SJ's frequency is 59.02 Mc/s., and he is ready to arrange skeds at any time in the evenings or at week-ends.

G6MN and G6CW worked G16YW on August 2nd.

Shorts

GM3CAS (Aberdeen) heard F8XT and IISU between 1900 and 2000 B.S.T. on July 4th. The receiver was a converted R.1481, and the aerial a 137 ft. Zepp, 30 ft. high running north and south. G5AM (Ipswich) has a 3-element w.s. beam indoors only some 8 ft. from the transmitter, but nevertheless is experiencing a great increase in signal strength over the outdoor extended diapole. G3DBG (Swindon) is not on 58 Mc/s., but continues to receive batches of QSL's for supposed contacts on that band. All information has been handed, by 3DBG, to the G.P.O. G2BJS and 8NV operated from Redruth during June and worked F, HB and I, and made what is thought to be the first contact with Germany, DA2RA, and with Norway, LA1V. G2AJ (Hendon) had a QSO with GM30L (Dumfries), at 0030 GMT on July 19th, a distance of 280 odd miles, and now has 11 countries and 33 counties to his credit. 6HD (Beckenham), has worked 3ABH in Dorset, in which county 5UF and 800 are also active. G5MP (Hythe, Kent), who is almost completely cut off from the remainder of the country by the South Downs, heard 2AJ/P at 48 miles on July 4th, and is doing well with the European DX. He would much appreciate reports on his signals from any distance to the northwards. 2FZR (Snodland) reports hearing the Russian commercial station RVF on 58.55 Mc/s. at 1230 GMT on July 12th. Signals were RST 449, and reception only possible with the beam due north. RVF's fundamental frequency is approximately 11,700 kc/s.

G6DH points out that many operators are rather slow to recognise sporadic E openings. In his opinion more consistent activity in Europe in the early mornings and during the day would lead to good long distance QSO's. 50 Mc/s. has been more consistently open in this respect than has 58 Mc/s. where sporadic E has been extremely patchy, and to help counteract the violent fading inseparable from such conditions he advocates the practice of signing one's call frequently. SM5VL on 50 Mc/s. was worked cross-band from 2s on June 5th, OH2NY and 2PK and HB9 being heard at the same time—1230 GMT.

"Skeds"

Requests have been received for details of the times of transmission and frequencies of stations working regularly on the 58 Mc/s. band. We have published from time to time such information as has been submitted to us, and readers' co-operation is invited to make this a regular feature to be displayed for easy reference in a "box" each month. If you have definite times of activity, on the band, please let us know, together with your frequency and whether listeners' reports are desired or not. We hesitate to reprint such data as has already appeared, without confirmation that it is still accurate. To take care of this position in the future, skeds will be published once only, unless the operator concerned states that they will be continued until further notice. Should the response be forthcoming, it is proposed to extend this feature to the other V.H.F. bands when their release and activity thereon makes this course practicable.

2400 Mc/s. QSO in Scotland

Hard on the heels of the achievement of a two-way QSO on 2,350 Mc/s. reported in our last issue, comes news that Messrs. G. A. Raeburn, GM2KP, and John B. Rimmer, GM3AKK, made a two-way phone contact on 2,400 Mc/s. over a distance of 1 mile on July 20th. Contact was established at 1800 GMT, and was maintained for 14 hours. Both the transmitter and the receiver employed lighthouse tubes in re-entrant cavities; a 2C43 in the transmitter and a 2C40 as local oscillator in the superhet receiver, which had in addition a crystal mixer and six stages of 30 Mc/s. IF. Both operators have been engaged in constructing gear for this band for more than a year, and we offer our hearty congratulations to them upon this successful outcome to their experimental work.

General

Mr. W. Davies, BR5 5091, The Bungalow, Kingsley Fields, Nantwich, Cheshire, would like to see a design for a good 144 Mc/s. receiver employing battery valves. He has acquired an AN/CRW-2 receiver, and would appreciate information regarding its working frequency, and if possible, a loan of the circuit diagram.

Please note that your news should reach G2UJ by August 24th, for inclusion in the September issue, and don't forget to let us know if you make regular appearances on the 58 Mc/s. band.

Plush.—For three hours on July 30 (between 1800 and 2100 G.M.T.) GM2KP transmitted to GM3AKK on a frequency of 2,400 Mc/s. Signals were R5 39 plus throughout. Two-way contact was not possible due to a receiver breakdown.

Scotland

No less than 14 GM stations were active during Field Day, three of them portable. One of these, GM2DRD/P, was at Huntingfould Farm, 7 miles south of Forfar, and 800 feet a.s.l. The gear included an EL32—RK34—807 transmitter, with 15/25 watts input from a motor generator, and a BC 348 receiver plus a 6AC7/6K8 converter working from batteries. Despite torrential rain and a gale of wind, contact was made with six Scottish stations and F8DI, L.O. 11AS and 11AY. F8KV, NH, 9HF, KB, and HB8AT were all heard, and a report of reception was received from G4LX in Newcastle. GM2HIK, 3CFT and 6RI assisted in operating the station. Surely a most satisfactory first attempt on 58 Mc/s., for which we feel that 2DRD's war time experiences with rather more serious if somewhat lower frequency V.H.F., stood him in good stead.

GM3AXO (Markinch, Fife) was also on 58 Mc/s. for the first time on July 4th, but not portable. Using his main transmitter as the exciter for an 832, and a 3-element wide-spaced beam, contacts were made with GM2DRD/P, 3BEB, 3DAU, 4AN and 6X1, F9NJ, HB9EI, 11AS, AY, JG, MG, and PO, while many other European stations were heard with the Type 27 converter. Incidentally, 3AXO has found that a 10,000 ohm in place of the 500 ohm resistance in the H.T. feed to the EC 52 in this unit results in a great improvement in stability.

New County on 58 Mc/s.

G2HDU is now operating from Oakham, Rutland, thus putting England's smallest county on the 5 metre map. Although 350 feet a.s.l., the station is in a valley—the Vale of Catmose—only open to the northwest, and so far contacts have been made with Northants, Leicester, Cambridge and Nottinghamshire, but with an improved position for the 3-element beam it is hoped to get out better. Operation is confined to week-ends until about 1930 GMT on Sunday evenings. The frequency is normally about 59 Mc/s. (V.F.O.).

News from Northern Ireland

G15SJ (Belfast) is now operating, and on June 27th made what is thought to be the first 58 Mc/s. G1/OK contact by working OK3DG. He also claims the first G1/G QSO—3BW (Whitehaven, Cumberland), on the same date. Congratulations, Stanley, O.M., and the same to Palmer Allen G16YW/P on his contacts with 11DA and with GW6OK, both claimed as "firsts." During Field Day G15SA/P worked F9BI, G3BW, G12HML,

* 33 Earls Road, Tunbridge Wells.

NEWS FROM HEADQUARTERS

COUNCIL, 1948

President:

VICTOR M. DESMOND, G5VM.

Executive Vice-President: W. A. Scarr, M.A., G2WS.

Hon. Secretary: K. Morton Evans, O.B.E., G5KJ.

Hon. Treasurer: A. J. H. Watson, F.S.A.A., G2YD.

Hon. Editor: Arthur O. Milne, G2MI.

Immediate Past President: S. K. Lewer, B.Sc., G6LJ.

Members: I. D. Auchterlonie, G6OM, G. F. Bloomfield, Ph.D., A.R.I.C., G2NR, F. Charman, B.E.M., G6CJ, D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E., G5CD, C. H. L. Edwards, A.M.I.E.E., G8TL, R. H. Hammans, G2IG, J. W. Mathews, G6LL.

General Secretary: John Clarricoats, G6CL.

G.P.O. Liaison Officer: Arthur E. Watts, G6UN

June Council Meeting

Resume of the Minutes of a Meeting of the Council of the Incorporated Radio Society of Great Britain held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, June 15, 1948, at 6 p.m.

Present.—The President (Mr. V. M. Desmond in the Chair), Messrs. Auchterlonie, Bloomfield, Charman, Corfield, Edwards, Evans, Lewer, Mathews, Milne, Scarr, Watson, Watts and John Clarricoats (General Secretary).

Exhibition.

It was reported that Dr. R. L. Smith-Rose had accepted an invitation from the Council to open the Exhibition.

It was agreed to extend an invitation to the G.P.O. to take space at the Exhibition.

Trade Exhibits at O.R.Ms.

A circular giving guidance to R.R.s. and others responsible for arranging trade exhibits at O.R.Ms. was approved.

Technical Booklets.

It was reported that complimentary copies of new R.S.G.B. technical booklets had been sent to all I.A.R.U. Societies and an invitation extended to them to place orders for bulk quantities.

German Amateurs.

A message of greetings was read from the President of the D.A.R.C. (B.Z.). It was reported that some 2,000 Germans attended a recent Amateur Radio Convention in Bad Latenburg.

Regional Matters.

It was resolved not to agree to support a suggestion made by Mr. Uppington that two O.R.Ms. be held in Region 9 during 1948.

It was resolved not to agree to a suggestion made by Mr. F. C. White that the Council should appoint representatives to attend an unofficial Regional Meeting in Guildford during 1948. (An official regional meeting is due to be held in Region 8 during 1949.)

Regional Representation.

The Council accepted with regret Mr. Sherry's resignation from the office of Region 6 Representative and recorded their thanks to him for his past services.

Mr. John Douglas, GM2CAS, of Aberdeen, was appointed Region 12 Representative.

Membership.

Resolved (a) To elect 154 Corporate Members, 43 Associates and 8 Junior Associates. (b) To grant Life Membership to Mr. J. E. James, G3DEK. (c) To grant Corporate Membership to 9 Associates and Junior Associates who had applied for transfer.

Affiliations.

Resolved to grant affiliation to:—
Courtauld's Amateur Radio Group.
S.R.D.E. Amateur Radio Society.
Stoke-on-Trent Amateur Radio Society.
Wirral Amateur Radio Society.

Band Planning.

Consideration was given to a letter received from the A.R.R.L. dealing with decisions reached at the Annual Meeting of the Board of Directors.

It was reported that a meeting of the Codes of Practice Committee would be held shortly to consider views expressed by European I.A.R.U. Societies and by individual members or groups of members.

Dr. George Bloomfield.

Dr. Bloomfield advised the Council that he would be leaving England on August 18 next to take up an appointment in Malaya on behalf of his Company. He expressed regret that he had not been able to foresee this development when he agreed to stand for election to the Council in November, 1947.

S.A.R.L.

Correspondence was read from two members concerning a decision of the South African Radio League to set up an Official Observer Service.

It was resolved to advise the members in question that whilst the Council view the matter referred to with concern they must regard it as of a domestic nature in South Africa and one in which the Society cannot interfere.

Transmitter Interference.

It was reported that good progress has been made by Messrs. Mathews, G6LL, and Milne, G2MI, in connection with the manuscript of a new technical booklet dealing with Transmitter Interference.

An estimate for printing 10,000 copies was approved.

Subscription Rates.

The Council considered a letter from the Chingford Group referring to a statement made at the London O.R.M. that subscription rates may have to be increased.

The Hon. Treasurer was requested to reply to the letter.

Television Interference.

The Council received a lengthy Report covering a meeting which had taken place between representatives of the Society and the G.P.O. on television interference problems. (A statement dealing with certain aspects of the problem appeared in the July issue.—ED.)

The Council also received a Report covering a meeting which had taken place between representatives of the Society and the Engineer-in-Chief of the G.P.O. on matters relating to the release of new V.H.F. and U.H.F. bands. It was reported that at this meeting consideration had been given to systems of transmission and powers to be used when the new bands are released.

The meeting terminated at 9.30 p.m.

London (I.E.E.) Meetings

The General Secretary will be glad to hear from any member who is willing to read a paper on a subject of topical interest at one of the forthcoming London (I.E.E.) meetings.

Representation

The following are additions and amendments to the list of Town, County and Regional Representatives published as a Supplement to the February issue.

Regional Representative

Region 6 .. A.P.G. Amos, G3AGM, Ty Gwyn, Mentone Avenue, Aspley Guise, Bletchley, Bucks. (Returned unopposed).

The election of Mr. Amos as Region 6 Representative leaves a vacancy for the office of Bedfordshire C.R.

County Representative

Region 2
Yorkshire (West Riding) .. G. E. Ferrar, BR15045, 26 Crescent Road, Sheffield. (Returned unopposed.)

Region 3.
Warwickshire .. T. Martin, G2LB, 3 Gladys Road, South Yardley, Birmingham. (Result of ballot: Mr. Martin 50 votes, Mr. Walker 26 votes.)

Town Representatives

Region 1.
East Lanes, Oldham .. E. Hulme, G3BQT, 20 Parkway Chadderton.

Region 3.
Herefordshire, Hereford .. Max Conu, BR15036, 5 Orchard Gardens, Putson.

Region 5.
Essex, Southend .. M. Buckwell, G5UK, 19 Meadow, Westcliff-on-Sea. (Returned unopposed.)

Vacancies

The following members have tendered their resignation as County or Town Representatives.

Region 9.
Gloucestershire .. B. M. Morrissey, G5YK, County Representative.

Region 8.
Sussex—Brighton & Hove G. Johnson, BR55759, Town Representative.

Corporate Members resident in the counties of Bedfordshire and Gloucestershire and in Brighton and Hove are invited to submit a nomination in accordance with the instructions given in the Members' Circular published with the September, 1947, issue of the BULLETIN. Closing date for nominations, August 31, 1948.

HIC ET UBIQUE

Queen Mary College Society

The Amateur Radio Society of the Queen Mary College (University of London), Mile End Road, London, E.1, will recommence activities at the beginning of the academic year in October. The Hon. Secretary, Mr. J. W. Peppitt, BR512746, would like to hear from freshmen who are interested in Amateur Radio. The Society holds the call G4RG.

Rhigos and District Radio Club

A series of lectures on the design of a high quality short-wave receiver are being given in the Club Room, R.F. Equipment, Ltd., E.S. Trading Estate, Hirwaun, near Aberdare. Lectures commence at 7.20 p.m. and all interested members are invited to attend. The dates for the next three meetings are August 28, September 11 and September 25. Details may be obtained from the Hon. Secretary, Mr. F. Hamer, GW8BW, 7, Neath Road Bungalows, Rhigos, near Aberdare, Glam.

Slade Radio Society

The following programme of meetings of the Society (Headquarters: Parochial Hall, Broomfield Road, Slade Road, Erdington, Birmingham, 23) has been arranged:—

- Aug. 20 Mr. Ted Southall, "Radio N.B.G." (see R.S.G.B. BULLETIN, May, 1946).
 Aug. 22 D.F. Test.
 Sept. 3 Mr. W. J. Hartwell, "Practical Television—hints and experiences on television reception."
 Sept. 17 Mr. D. Goddard (Birmingham University), "Atomic Physics."
 Sept. 19 Midnight D.F. Test.

Meetings commence at 8 p.m. prompt. Full particulars of the Society may be obtained from the Hon. Secretary, Mr. C. N. Smart, 110 Woolmore Road, Erdington, Birmingham, 23.

resume of the Society's activities during June. These included participation in N.F.D., a visit to Droitwich B.B.C. Station and a Joint Committee Meeting with other West Midland Societies.

The main event of the evening was a talk on "The Design and Use of Cathode Ray Oscilloscopes" by Mr. W. H. Rigg, A.M.I.Mech.E., A.M.Inst.Fuel (Lydiat Ash Laboratories, Bromsgrove). Mr. Rigg described several interesting amplifiers, time-base circuits and multi-vibrators.

Those wishing to join the Society should contact the Secretary at 35 John Street, Brierley Hill.

T.V.A.R.T.S.

The Thames Valley Amateur Radio Transmitters Society is holding a 3.5 Mc/s. Field Day on August 29 for the Cooper Challenge Cup and other prizes. At least six portable stations will be active and the event is open to any member of the T.V.A.R.T.S. Power will be limited to 5 watts on C.W. or Telephony and either batteries or motor generators may be employed. Entitled the Thames Valley "CQ" Contest, it will commence at 11 a.m. and finish at 7 p.m.

Telearchics Group

Mr. C. Terry, BR512402, "The Hermitage," Silver Street, Cambridge, Leader of the above group, regrets that pressure of private business has so far prevented him from issuing a further Bulletin to group members. A Bulletin is, however, in print but Mr. Terry has no means of getting enough copies of the diagrams reproduced. Offers of help would be appreciated.

Mr. Terry is willing to hand over Group Leadership to any one who has sufficient free time to devote to the task of maintaining contact with its 75 members. Offers should be sent to Mr. Terry at the above address.

Editors' and Engineers' Antenna Manual

The long-awaited *Antenna Manual* has now been published and copies may be ordered through the Society, price £1 Delivery 4-6 weeks.



WEST REGIONAL MEETING, GRAND HOTEL, BRISTOL, SUNDAY, JULY 17, 1948. Front row, fourth from left, GW8UH, followed by G8TL, Mrs. C. H. L. Edwards, G6CL, Miss May Gadsden, G5YM, G2BAR, G6OH, G2HX.

Southport

The Southport T.R. is arranging for Morse instruction every Monday and Thursday evenings at 8 p.m. at 38A Forest Road. Members wishing to enrol for night classes for the Radio Amateurs' Examination are asked to contact him before September 1. His phone number is Southport 87503.

Stourbridge and District Amateur Radio Society

At the meeting, held on July 6th at King Edward's School, Stourbridge, the Secretary (Mr. W. A. Higgins), G8GF, gave a

The book contains 306 pages, is fully illustrated and the author is Woodrow Smith, formerly Editor of *Radio Magazine* and *Radio Handbook*.

We hope to publish a review in an early issue

An Offer

Mr. A. V. Bryant, 27 Hill Road, Mitcham, Surrey, has handbooks for the ARSSD and ARSSLF and is willing to loan them to interested members.

**NORTH EASTERN REGIONAL
— MEETING —
SUNDAY, SEPTEMBER 5th, 1948
CROWN HOTEL
NEWCASTLE-ON-TYNE**

Assemble ...	1.30 p.m.
Meeting ...	2.30 p.m.
High Tea ...	4.30 p.m.
Film Show ...	6 p.m.

Trade Show, Lucky Dip, Club Exhibits, Buffet.

Tickets (price 5/6) from R.R., C.R.'s, or T.R.'s by not later than September 1st, 1948.

**NORTH WESTERN REGIONAL
— MEETING —
SUNDAY, SEPTEMBER 19th, 1948
TUDOR RESTAURANT, BELLE VUE,
MANCHESTER**

Assemble ...	12 noon.
Luncheon ...	1 p.m.
Meeting ...	2.30 p.m.
Tea ...	5 p.m.

Tickets 8/6 each (which price includes cost of lunch and tea) from G3AO, 55 Derbyshire Road, Sale, Manchester, or G3BU, 4 Boddman Road, Higher Crumpsall, Manchester, 8, by not later than September 10th, 1948.

Slow Morse Transmissions

Mondays	20.00 B.S.T., 1900 kc/s. ..	G2AJU (Stowmarket)
Mondays	20.00 B.S.T., 1800 kc/s. ..	G2BJS (Bradford)
Mondays	21.00 B.S.T., 1900 kc/s. ..	G3BCN (Bournemouth)
Tuesdays	22.00 B.S.T., 1806 kc/s. ..	G8TL (Ilford)
Tuesdays	23.00 B.S.T., 1820 kc/s. ..	GM4AN (Kirkcaldy)
Thursdays	22.30 B.S.T., 1803 kc/s. ..	G3OB (Manchester)
Thursdays	19.00 B.S.T., 1900 kc/s. ..	G3BCN (Bournemouth)
Fridays	20.00 B.S.T., 1900 kc/s. ..	G2AJU (Stowmarket)
Fridays	20.30 B.S.T., 1835 kc/s. ..	G8LZ (Gravesend)
Fridays	23.00 B.S.T., 1820 kc/s. ..	GM4AN (Kirkcaldy)

Volunteers for this service are still required as it is desired to cover the whole country. The service is of particular importance to members living in remote areas. Details to Mr. C. H. L. Edwards, G8TL, 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

Danish V.H.F. Activity

Details of the V.H.F. Field Day organised by E.D.R. and announced in the July BULLETIN (page 17) are now to hand. The contest periods are as follows:—

Five Metre Band.

August 21, from 18.00 to 21.00 G.M.T.

August 22, from 09.00 to 11.00 G.M.T. and 13.00 to 15.00 G.M.T.

Two Metre Band (144-146 Mc/s.).

August 21, from 21.00 to 22.00 G.M.T.

August 22, from 08.00 to 09.00 G.M.T. and 15.00 to 16.00 G.M.T.

Two metre activity is likely from 18.00 G.M.T. on Saturday, August 21, until 16.00 G.M.T. on Sunday, August 22, but will probably be concentrated in the official contest hours.

During the contest, the Danish stations will be operating an auxiliary net on 3.725 kc/s. for exchange of information and arrangement of schedules.

Stray

Mr. Peter A. Lovelock, formerly G2AIS of Milford, Bucks, is now living in New York and would be pleased to meet any British amateur who may be visiting that city. His telephone number is Newtown 9-7467.

Silent Keys

It is with deep regret that we record the passing at the early age of 38, of Mr. Harry Francis West (G3AFC), of Highbury, London, N.5, on June 26th last.

The following tribute has been received from Mr. Bernard Randall (GW3ALE), President Grafton Radio Society.

Mr. West joined the R.N.V.(W.) R. in 1938 and operated under the Naval Reserve call MC5 until the outbreak of hostilities. He enlisted in the R.N.V.R. in 1941 and saw service at sea and shore stations in North Africa and Italy—attaining the rank of C.P.O.(Tel.). He was discharged on medical grounds in 1945.

Mr. West joined the Grafton Radio Society in 1946 just before being licenced as G3AFC. He was elected a Vice-President of that Society in 1947.

Although his Amateur Radio activities were necessarily limited by his poor health he was remarkably active on 7 Mc/s. His gear was beautifully made and its design showed a measure of technical ingenuity lacking in all but a few amateur stations.

Mr. P. Beresford, (BR88076), represented the R.S.G.B. at the interment which took place at Islington Cemetery on July 2nd. The Grafton Society was represented by its Honorary Secretary, Mr. W. H. C. Jennings (G2AHH).

Sincere condolences are offered to Mrs. West and her 10 year old daughter. They may be assured that Harry's cheerful personality will ever be remembered by a large circle of friends.

We also record with deep regret the death of Mr. Cyril Stainton, (G2KRM), of Bilton, near Hull.

Mr. Stainton was the oldest member in the Hull area, and it is believed that he obtained his first licence some years prior to the first world war. Before the B.B.C. was introduced he broadcast regular programmes by gramophone records and had a large listening public in the Hull area. He was held in great personal esteem by all local members of the Society, and his passing marks not only the absence of a familiar call sign but the loss to Amateur Radio of a man who was the true embodiment of the spirit of our great hobby.

He leaves a widow and two sons to whom we extend our deepest sympathies.

It is also our sad duty to record the passing of Mr. Frank Sutcliffe (BR8 5560) of Ashton-under-Lyne. Mr Sutcliffe participated in the last 5 Metre Field Day, and was a keenly appreciated member among amateurs in his area. Our sympathies are extended to his wife and close friends.

Can you help?

Mr. J. Orr, G8JO, 22 Pembroke Terrace, South Shields, Co. Durham, would appreciate information concerning the R.A.F. Transmitter type T1136A and Receiver type R1225.

Mr. H. G. Newland, G5ND, 161 Penrose Avenue, Blackpool, Lancs., wishes to contact other members using the Canadian Transmitter type C43.

Mr. G. Lancefield, G3DWQ, 54 Brixton Road, Frenchwood, Preston, Lancs., is seeking circuit details of the R.A.F. Transmitter type T1115.

Mr. W. H. Moore, G3CUC, Thornbarrow Cottage, Thornbarrow Road, Windermere, Westmorland, requires details of the A.M. Transmitter type T1403A and its associated Power Unit type 266.

Mr. A. W. Owen, GW2FUD, "Tan-y-Bryn," North Road, Caernarvon, would appreciate the loan of technical manuals for the American BC939A, BC610, SCR-399, SCR-499, and BC433, or any information on these units.

Mr. G. Meddings, Associate, 30 E. Clifton Street, Hurst Hill, near Bilton, Staffs., wishes to obtain a manual or circuit diagram for the U.S. Receiver BC453B. This information is also required by Dr. W. R. Gilmore, G2DKN, Walton Hospital, Liverpool, 9.

Mr. N. C. Nicholls, G3AYX, 20 Ennismore Avenue, Chiswick, London, W.4, needs a circuit diagram and details of the plug connections of the modulator BC456B part of the Command Set 274N.

Mr. W. Davies, BR85091, The Bungalow, Kingsley Fields, Nantwich, Cheshire, has recently purchased an Emerson AN/CRW.2 Receiver, and would be grateful to any member who can loan him the theoretical diagram. He is anxious to know the frequency coverage of this set.



DINNER-MEETING BANGOR, NORTH WALES, JUNE 21, 1948. Front row, third from left, GW6KY, followed by G6CL, G2WS, GW2CCU, GW5FU.

A Burn Out

Mr. Geoffrey Johnson, G2BJY, 22 Lynton Avenue, Hateley Heath, West Bromwich, Staffs., recently had the misfortune of losing by fire most of his treasured QSL cards, including 92 cards towards DXCC, 42 towards W.A.S., and 49 towards E.D.X.C. In addition he lost many 5 metre cards. G2BJY would be most grateful if those who have worked his station would send a duplicate card. He was particularly proud—and rightly so—of his original collection, since all contacts were made using an input of 30 watts or less.

(Overseas Journals please copy.)

R.S.G.B. to the Rescue

Michael Fadil takes good care of his membership certificate. It is just as well he does so—for otherwise he might still be kicking his heels in a Lebanese prison. A few months ago, sightseeing in Beirut, he decided to take a souvenir snapshot of an imposing looking building. But, unfortunately, he had chosen the local Police Station and in that part of the world, the *gendarmerie* are perhaps unduly modest. Hardly was the shutter closed, than Michael found himself being firmly invited by a plain-clothes detective to pay a non-social call upon the Commissioner.

Now, if it is unwise to take photos of the judiciary, it is positively foolhardy to do so without your passport or identity papers. In fact our hero seemed all set for a long spell behind vertically stacked dipoles when he suddenly remembered his membership card. Whether or not those officers of the law possessed a detailed knowledge of the R.S.G.B. remains doubtful. But one thing is certain, Michael is still at liberty and keener than ever on Amateur Radio!

BOOK REVIEWS

FREQUENCY MODULATION ENGINEERING. Christopher E. Tibbs. Chapman & Hall. 28/-.

This book describes, from the point of view of the practising engineer and experimenter, the art of frequency modulation engineering and its applications to date. This it does with the minimum of mathematical treatment, yet the basic principles are adequately covered for the purposes of the designer.

The book provides a well laid-out survey of all the important published work on the subject rather than offering original or new thought. In view of the diversity of scientific papers which have appeared in a great variety of journals such a book deserves a place on the shelves of anyone interested in the subject.

The first four chapters deal with the basic principles of phase and frequency modulation and the advantages claimed for such systems. To this effect two of these chapters are solely concerned with noise structure and interference.

Chapter 5 deals with the propagation of waves in the frequency bands which lend themselves to the effective use of frequency modulation. Then follows a chapter on aerials. As the author says in his preface, it would not be difficult to write a whole book on this subject. Nevertheless, within the 45 pages of this chapter he describes most of the types which have been used for F.M. broadcast transmission and reception. The polar diagrams, and input impedance are compared and a section on transmission lines is included.

In the chapter on transmitters the principles of reactance valve and phase modulators are described together with some less common circuits. It is a pity that the book went to press too early to include a description of the phasitron, but it is surprising that some older systems of increasing the deviation ratio such as that described by Pieracci, and the Armstrong "dual channel" arrangement are not described in the text. A detailed description of two F.M. commercial transmitters is given.

Chapter 8 covers limiters and discriminators. Double tuned circuit, phase difference and counter type discriminators are described, with practical circuit information, but the more recent "ratio-detector" is not included. In a chapter on receivers, useful constructional details are given together with a complete circuit diagram, with component values, of a typical American commercial design.

The book concludes with chapters on measurements and applications of F.M. systems.

H.A.M.C.

RADIO ENGINEERING. Vol. I. By E. K. Sandeman. Chapman & Hall, Ltd. 45/-.

This book is probably the most comprehensive work on the subject which has yet come from the pen of an English author. Within the 775 pages which comprise Vol. I (the second volume is in the press) are sixteen chapters dealing with basic theory of electric fundamentals and radio circuits, thermionic valves as amplifiers and oscillators, the theory and practice of radio transmitters, and aerials and feeders. Vol. II will cover receivers, network theory, filters and equalisers, interference and noise, and measuring equipment.

The first few chapters are devoted to basic theory which has, of course, been treated by many different authors in the past, but the method of treatment here is essentially direct, and is likely to appeal to the engineer and more advanced amateur.

These chapters are amply provided with tabulated design information, e.g. wire tables, charts of H.F. resistance of conductors, inductance of coils, resonance charts, attenuator design data, etc., to quote but a few at random.

After a chapter on the theory of valves there follows an extensive chapter on amplifiers, in which the design and operation of Class A, B and C amplifiers is fully discussed. It is interesting to note that the bulk of this chapter is concerned with R.F. amplifiers. The design of Class B and C R.F. amplifiers is fully dealt with, and the operating and setting up procedure for such stages receives an unusual amount of attention.

Then follows a chapter on oscillators in which crystal oscillators are fully covered, whilst such practical subjects as the generation and location of parasitic oscillations in circuits receive due attention.

The next chapter deals with driving equipment, including arrangements for synchronising transmitters, which may not interest the amateur directly, and frequency multipliers, which certainly will. The following chapter on Modulators includes valuable information on the practical adjustment of most normal types of amplitude modulators and also on frequency modulators.

The two chapters on Types of Transmitters and the Operation and Maintenance of Transmitters, are written around broadcast station practice, but there is much interesting information even here for the owner of a low power station.

The final chapter of nearly 130 pages describes feeders, aerials and aerial coupling circuits. The information on the operation of feeders is very complete, although many of the simpler types of aerial system, dear to the heart of most amateurs, are, naturally, not included.

It is perhaps a significant indication of the present day extent of the subject of radio engineering, that even in a work of this size there is included nothing on the more specialised branches, such as V.H.F. equipment and television.

In the first edition of a work of this kind some misprints are

inevitable, but fortunately most of them are obvious, and there is no occasion to list them here.

Among the few criticisms we have to offer may be mentioned the table of call signs and frequencies of B.B.C. stations, which occupies nearly four pages, and not only seems to us to be out of place in such a book, but is likely to be out-of-date long before the remainder of the book.

The author's style appears to change from time to time as though it has been obligatory to work in certain B.B.C. standing instructions, which sometimes spoils the otherwise very readable nature of the book. So much is the practical engineering outlook in the author's mind that he apparently has no objection to the use of such abbreviated terms in the text as "neuting" and "modding amplifier." The circuit diagrams are clearly drawn and uniform in style.

Finally, may we say how wholeheartedly we concur with the last but one paragraph on page 301. Does this sound the death knell of the "B.B.C. decibel?" Our appetite for Volume II has been whetted to no small extent.

H.A.M.C.

TELEVISION RECEIVER CONSTRUCTION. Iliffe & Sons. 48 pp. 58 diagrams and illustrations. 2/6, by post 2/9.

In these days of paper shortage and the limitation of circulation, many people are unable to obtain *Wireless World*. Last year our contemporary ran a series of articles giving complete details for the construction of a Television Receiver, and so that they may be available to any who are interested they have been reprinted in booklet form.

The information given is sufficient for any amateur to build his own television, given normal constructional ability. It includes details for the making of the more special components such as deflector coils and scanning transformers.

The set adopts a straight circuit for vision and can employ either a 9 in. or 12 in. Tube, while the sound section is designed to be fed into the pick-up terminals of a Broadcast receiver.

The articles are of the usual high standard associated with *Wireless World* and the booklet, at its low price, represents extremely good value to all intending constructors of Television Receivers.

J. W. M.

CATHODE RAY OSCILLOGRAPH. 3rd Edition. By J. H. Reyner. Pitman & Sons. 190 pp., 134 diagrams and illustrations. 8/6.

In this edition the author has, in places, modified his previous text to bring it up to date with modern technique, and has added references to the latest applications of this versatile piece of apparatus.

The nine chapters contain a wealth of information on the practical applications of the oscillograph, covering such subjects as waveform examination, frequency response curves, valve characteristic measurements, harmonic analysis and frequency comparison.

The book can be thoroughly recommended to all who are desirous of improving their knowledge of cathode ray tube technique, and especially to those who have acquired or are hoping to acquire an oscilloscope, and who desire to make the best use of it.

J. W. M.

THE RADIO AMATEUR'S HANDBOOK. (Twenty-fifth Edition-1948). By the HQ Staff of the A.R.R.L. 760 pages. 1,712 illustrations and 83 charts and tables. Price 12s./6d. (Available through the R.S.G.B. Delivery about 6 weeks.)

Considerably larger, more illustrations, better paper, several new chapters, new constructional material, reorganised and revised, all in a dark crimson and silver cover—attractive in appearance, as in everything else—the new edition of the Handbook is here.

The subject matter, in previous editions, was divided into four sections, the principal two of which were "Principles and Design" and "Equipment Construction." This meant that, for example, the principle of the superhet and examples of the construction appeared in quite separate places. Now, the treatment of principles has been completely reorganised and integrated with the constructional data, so that one views the principles alongside the practice. This is, undoubtedly, a great improvement, and the HQ Staff are to be congratulated on the success of the new arrangement.

There are three main groupings, according to frequency: HF, VHF and UHF. The latter, along with microwaves, receives a separate chapter. Here are found butterfly circuits, lighthouse tubes, klystrons, magnetrons, wave guides and cavities, as well as transmitters and receivers for 235 and 420 Mc/s.

A most useful and timely chapter is "Eliminating Broadcast Interference": here is some exceedingly sound advice from both a technical and psychological viewpoint. This chapter will be found as useful to British amateurs as to Americans.

The writer, in reviewing the 1947 edition, referred to the lack of information about DXCC, WAS Certificates, etc., and the call-sign districts of the U.S. This information and much more of the same sort—for example, the countries list, the country prefixes, the amateur prefixes, etc.—is now included, and will be greatly appreciated.

A number of neat station arrangements illustrate a new and useful chapter on "Assembling a Station": being, one hopes, not a cynical revision of an old title "Building a Station."

Yes, believe it or not, they have done it again; it is—actually—bigger, and—undoubtedly—better than ever.

T.P.A.

FORTHCOMING EVENTS

REGION 1

Accrington.—September 8, 7.30 p.m., Cambridge Street, School.
 Ashton.—September 5, 3 p.m., New Jerusalem Schools, Katherine Street.
 Bolton.—September 7, 8 p.m., Y.M.C.A.
 Burnley.—September 1, 7.30 p.m., Mechanics Institute.
 Bury.—September 9, 7.30 p.m., Atheneum, Market Street.
 Darwen and Blackburn.—Sept. 3, 17, 7.30 p.m., Weavers' Institute, Darwen.
 Manchester.—September 6, 7.30 p.m., Reynolds Hall, College of Technology, Sackville Street.
 Oldham.—September 1, 15, 7.30 p.m., Civic Centre, Clegg Street.
 Rochdale.—September 5, 3 p.m., Drill Hall, Baron Street.
 Southport.—Sept. 8th, 8 p.m. at 38a Forest Road Nr. St. Lukes Station.
 St. Helens.—Members interested in the formation of a Group please contact Mr. C. Rattigan, 197 Mill Lane.

REGION 2

Barnsley.—August 27, September 10, King George Hotel, Peel Street.
 Bradford.—August 31, September 21 (Annual Meeting), Cambridge House, 66 Little Horton Lane.
 Catterick.—Tuesdays, 7 p.m., S.T.C., H.Q. Block, Vimy Lines.
 Doncaster.—Tuesdays and Wednesdays, 7.30 p.m., 73 Hexthorpe Road.
 Harrogate.—Wednesdays, 7.30 p.m., Rear of 31 Park Parade.
 Huddersfield.—August 25, September 8, 7.30 p.m., Plough Hotel, Westgate.
 Hull.—August 25, 7.30 p.m., Imperial Hotel, Paragon Street.
 Leeds.—Fridays, 7 p.m., Swathmore Settlement, Woodhouse Square.
 Middlesbrough.—September 20, 7.30 p.m., Cleveland Scientific and Technical Institute, Corporation Road.
 Newcastle.—August 30, 8 p.m., British Legion Rooms, 1 Jesmond Road. September 5, O.R.M. at Crown Hotel (see separate announcement).
 Sheffield.—Aug. 25, 8 p.m., "Dog and Partridge," Trippit Lane. September 8, 8 p.m., Albreda Works, Lydgate Lane.
 South Shields.—Fridays, 7.30 p.m., Trinity House, Laygate.
 Spennorth.—September 1, 15, 7.30 p.m., Temperance Hall, Cleckheaton.

Sunderland.—Wednesdays and Fridays, Prospect House, Prospect Row.
 York.—Wednesdays, 8 p.m., 29 Victor Street.

REGION 3

Birmingham (M.A.R.S.).—September 21, Annual General Meeting. October 5, Annual Dinner.
 South Birmingham.—September 5, 19, 10.30 a.m., Stinchley Institute.

REGION 5

Cambridge.—August 20, 7.30 p.m., Jolly Waterman, "Valves for V.H.F. Work" S. Smith.
 Chelmsford.—September 7, 7.30 p.m., 184 Moulsham Street.

REGION 7

Barnes and Putney.—September 15, 7.30 p.m., 28 Nassau Road, S.W.13.
 Chingford.—August 19, 7.45 p.m., G3AOE, 1 Essex Road, N. Chingford. September 2, 7.45, p.m., G4GA, 1 Tembleton Avenue, South Chingford.
 Croydon (Surrey R.C.C.).—September 14, 7.30 p.m., "Blacksmiths Arms," South End.
 Edgware and District Radio Society.—August 18, 25, September 1, 8, 15, Orchard Cafe, Broadway, Mill Hill.
 Enfield.—August 15, September 19, 3 p.m., A and B Cafe, Southbury Road (junction with Ladysmith Road).
 Hayes (Middx.).—Sept. 7, 7.30 p.m. at Vine Hotel, Uxbridge Road, Hillingdon, (opposite Hillingdon Church).
 Hoddesdon.—September 2, "Salisbury Arms" Hotel.
 Peckham.—September 6, 7.30 p.m., "The Kentish Drover," Rye Lane (next Jones & Higgins).
 Slough.—August 19, "Filters," Part II, G2BWV. September 16, "Cathode Ray Technique," G2HOX. 7.30 p.m., Congregational Church Hall, Church Street.
 Southgate.—September 3, 7.30 p.m., "Merry Hills" Hotel (near Oakwood Station).
 Welwyn Garden City.—September 7, 8 p.m., Council Offices.

REGION 8

Farnham.—September 12, 3 p.m., G2ZC, 89 West Street. (A postcard if attending).
 Guildford, August 22, 3 p.m., G2YL, Petersmead, Meadow Walk, Walton-on-the-Hill. (A postcard if attending).
 Southampton.—September 4, 7.30 p.m., 22 Anglesea Road, Shirley.

REGION 9

Bristol.—August 13, September 15, 7.30 p.m., Keen's University Cafe, Park Row.
 Exeter.—Second Saturday, Y.M.C.A., 41 St. David's Hill.
 Plymouth.—Third Saturday, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.

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LETTERS TO THE EDITOR

The G8PO Aerial—Pros and Cons

DEAR SIR,—Since G8PO's article appeared last November, G2H DU and G8TS have written in criticism on theoretical and practical grounds. G2H DU deduces mathematically a front-back ratio of $\sqrt{2}$ in terms of field strength, representing 3 db.; a figure which coincides with the results obtained by G8TS. Now G8NY writes in defence of G8PO's claims.

My own experience with arrays of this type would indicate that some confusion may have arisen between the array illustrated by G8PO in Fig. 1C and that depicted in Fig. 1D of his article. In experiments carried out some time ago results similar to those subsequently claimed by G8PO were obtained with an array phased and fed as in Fig. 1D. Putting the feeders "in phase" in the G8PO manner reduced a high F/B ratio to about 3 db., while forward gain dropped from 4½ db. to approximately one decibel.

The above results, which seem to conform with theory, were dependent upon either system being reasonably well matched, and it is hoped to publish an article giving fuller details at an early date.

It was found that if the feeders were allowed to radiate substantially some queer effects were obtainable, due no doubt to the interaction of vertical and horizontally polarised radiations. If the excellent performances secured by G8PO and G8NY do in fact result from "in phase" connection, the possibility remains that each is using critical dimensions which permit the presence of standing waves to modify the system in a special manner. The fact that G8NY finds his feeder lengths (as distinct from his delay section) to be critical, lends weight to this theory. Increased B.C.L. interference, if experienced, would be another pointer as to whether vertically polarised radiation was present.

Yours faithfully,

C. A. HEATHCOTE (G3JR).

DEAR SIR,—The article in the November, 1947, issue by Lieut. Commander Ironmonger on his G8PO reversible array has attracted considerable attention in Australia. This has been so because, in the first place, the consistently reliable signal on 14 Mc/s. telephony from G8PO throughout last year naturally inclined discussion with Commander Ironmonger regarding the aerial system in use at his location.

Since he arrived in Australia, he has passed on much of his enthusiasm for the scheme, with the result that versions of his array are now under test at various VK stations, including my own.

The version in use at VK2NO is constructed on the Folded Dipole principle, and is constructed of K25 Telcon 300 ohm twin-lead (ribbon) throughout, including the radiators. In order to raise the centre impedance of the radiators to obtain a reasonably good match to the 300 ohm lines, each radiator has a third wire added. This is a length of rubber covered flex arranged in the centre of the ribbon, and taped thereto at intervals with sticky poly tape. The ends are soldered to the closed ends of the dipoles and the centre is broken to take the feedline at the same spacing. With addition of the extra wire to make 3 element dipoles, the impedance is raised considerably, and may be assumed to be in the region of 300 ohms because of the close proximity to each other of the radiators—one eighth wave in this case. From the start the system has proved extremely successful and with the reversible directivity arranged for suitable propagation to Britain over the long and short routes, the advantage over the WSJK system, previously used, is very marked. Outstanding feature is the back-to-front discrimination on local signals and the forward gain appears to be well worth-while. It is quite a coincidence, but the first British station I worked with after installing this system was G8NY, who informed me that he was using a similar system, but with spaced conductor dipoles. I consider that G8PO has hit upon a most useful idea, especially for the man with limited space at his disposal. There is undoubtedly much room for experimentation with various types of radiators, and one that suggests itself is the delta-match with 300 ohm K25 feedlines. With such a system adjustment could be made with the delta spacing and size to compensate for the drop in centre impedance, whereas Folded Dipoles are not easy to adjust *in situ*.

Another useful idea would be to apply two "inductively coupled" dipoles in place of the plain radiators as used in the original array at G8PO.

One station now using an array of the same type as the one in use at VK2NO, is VK2AGW at Wahroonga, near Sydney. Until recently he was GW3BGH at Barry, South Wales. Since installing the array, his signal reports from Britain have, similarly to my own, increased considerably.

Yours faithfully,

D. B. KNOCK (VK2NO), M.I.R.E.Aust.

Grid Driving Power

DEAR SIR,—The simultaneous publication of Mr. Walker's lecture on "Transmitter Design and Construction" in PROCEEDINGS OF THE R.S.G.B. and of Mr. Corfield's letter in the April BULLETIN seems very appropriate.

Mr. Corfield refers to a discussion of grid driving power in Class B and Class C amplifiers at a recent Society Meeting at the I.E.E. I believe that he is referring to the discussion I started when Mr. Walker read his paper.

The point I tried to make appears in the last paragraph of Mr. Corfield's letter, viz., that the method of obtaining bias does not affect the driving power required.

In the PROCEEDINGS OF THE R.S.G.B. version of his paper (page 12, column 2, paragraph 3), Mr. Walker repeats the error that the use of grid leak bias is wasteful of driving power. As Mr. Corfield states, the driving power required to give a grid current of 50 mA. at a bias of -150 volts is 7.5 watts (plus circuit and valve loss), irrespective of whether leak or battery bias is used.

Mr. Walker continues to state that if battery bias is used, the grid current will charge-up the battery. This is perfectly true, even in the ideal case when the battery is of zero resistance. So that (as pointed out in the discussion) power can be consumed by passing current through zero resistance. The energy, of course, is stored in chemical form.

Cases have occurred where grid current is used to charge accumulators, which may perhaps be the best way of "getting one's own back"!

Yours faithfully,

T. L. HERDMAN, G6HD.
40F Wickham Road, Beckenham, Kent.

Around the Trade

Radio Test Equipment manufactured by *Taylor Electric Instruments Ltd.*, will in future be sold under the name of "Windsor" instead of "Taylor." This change has been made in order to enable the Company to enter certain export markets which were hitherto closed to them because their products were conflicting with those of the *Taylor Instrument Company of America*, with whom they have no connection.

To improve mobile reception, *Fort Dunlop* is at present experimenting with a new motor tyre, developed from one employed by the R.A.F. during the war. This tyre, it is claimed, removes the static electricity generated by the movement between the tread and the road surface.

Stratton & Co., Ltd., announce a new range of transmitting condensers which promise to become even more popular than the types they replace. Type 612 is a split stator with a maximum capacity of 50 pF per section, specially suited for transmitters working on 14 and 28 Mc/s. Type 612 is identical except that it is longer and has a capacity of 100 pF per section, making it suitable for the lower amateur frequencies.

These condensers are of rigid construction and fitted with ceramic end plates 2½" square. The vane spacing is 0.08". Prices are 32s. 6d. and 36s. respectively.

Stratton & Co., Ltd., also announce that the price of the Eddystone 640 Receiver has been reduced to £27 10s. free of purchase tax, and that hire purchase facilities of an exceptionally generous character are being made available.

The Manufacturers point out that the keen discriminating amateur is now in a position to purchase a tried and proven modern communications receiver at a price challenging comparison with any "surplus" proposition.

The 640 is designed specifically for the amateur and is fully guaranteed for 12 months.

A comprehensive reference chart, measuring 4ft. 6in. by 2ft. 6in., has been designed and printed by *Mullard Electronic Products Ltd.* Based on the Atlantic City decisions, this chart has been executed in sixteen colours and shows the allocation of frequencies over the entire telecommunication spectrum: 10 kc/s. to 10,500 Mc/s. It should prove of great value to designers of communications equipment, and those concerned with navigational problems for ships and aircraft, as well as to radio amateurs. A smaller six colour chart is also envisaged. Enquiries should be made to the Communications Division, *Mullard Electronic Products Ltd.*, Century House, Shaftesbury Avenue, London, W.C.2.

Congratulations

To Mr. Alan P. Roberts, G3CHZ, ex-X22YT, who was married to Miss Frances Mack at Herne Hill Baptist Church, London, on June 12 last.

● There were 81,000 licensed amateur operators in the United States on December 31, 1947, and approximately 75,000 amateur stations.

● In the 15th annual report of the Radio Component Manufacturers' Federation, the amateur market for British components is estimated at £250,000 per annum.

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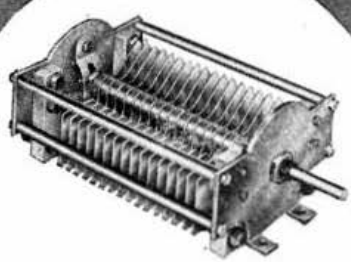


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ABSOLUTE bargain for quick sale.—Hallcrafters Sky Champion, good condition and performance. Also Eddystone 358, 90-31,000 kc/s. Offers over £18 for each.—G8MM, 204 Kenton Road, Kenton, Middx. WORDSWORTH 1267. [218]

ABSOLUTE bargains.—Must clear many hundreds of modern components: valves, meters, crystals, speakers, transformers, potentiometers, etc., at knock-out prices. S.A.E. for list.—Box 228, PARRS, 121 Kingsway, London, W.C.2. [228]

AC/DC Mains 5V superhet portable midget receiver. Medium and short waves. In brown plastic cabinet. Brand new £11. R1155 with 6V6 output energised speaker, power pack, illum. dial, etc. First-class condition, £17.—Box 172, PARRS, 121 Kingsway, London, W.C.2. [172]

R88D, perfect condition. Offers. Mains energised 10-inch speaker, 25s.—GM4RL, Croft, Tullibody, Alloa, Clackmannanshire. [212]

R88D in good condition, £35; AR77E less cabinet, £20; Eddystone 358, battery, £15, with 5 coil units; 1131 Mod. Power pack, £5; 12,000 volt 200 mA. Westinghouse power pack, £6; 2 Skyriders 5/10 meters, less power packs and valves, £7 the two. Wanted wire recording head.—G2FXR, Darsham, Suffolk. [222]

AVOMINOR Universal, £5; also Heayberd A.C. power pack output, 250 volts, 60 mA. with twin chokes, metal rectifier, etc., perfect condition, £8.—Box 231, PARRS, 121 Kingsway, London, W.C.2. [231]

AVO "7" £16. Valve tester, £12. Triplett 666 meter, £7. All as new.—155 Chipstead Valley Road, Coulsdon, Surrey. [234]

BC221 Frequency Meter, brand new, includes three spare valves and button lightweight headset. Offers over £15. R103A new, complete, £7.—109 Deightonby Street, Thurnscoe, Nr. Rotherham, Yorks. [189]

BC342—A.C. mains, good condition, buyer collect, £15.—BRS10546, 15 Ryder Way, Ickleford, Nr. Hitchin, Herts. [232]

BC348 Receiver, modified heaters for 6 volt, £15, with power supply, £20.—BRS16450, 57 Craig Park Avenue, Malpas, Newport, Monmouthshire. [232]

BEAMS—24/20 metres, motors, bearings, indicators, chimney lashings. Special offer, dural masts 1½ x 17 swg 11-12 ft, 17s. 6d. S.A.E. Microphone floor stands. Adjustable 3-5½ ft. Black anodised stems, black crackle base and rings. Other colours to order, 21s. 6d., £10 doz.—E. M. D. O. Ace Works, Staines. [169]

BULLETINS—January, 1939—January, 1948. Complete except for one missing copy. Offers.—WOOD, 92 Camden Road, Bridgwater, Somerset. [229]

B2 Power Pack wanted.—COOPER, Station House, St. Margarets, Stanstead Abbots, Ware, Herts. [184]

B2 Transmitter and Receiver including coils, brand new in steel case. Also power pack. Perfect, £12 10s. 0d.—Box 198, PARRS, 121 Kingsway, London, W.C.2. [193]

CALL BOOK. Complete list of HAMS throughout the world 10s., plus 9d. postage. Radio Handbook latest edition, 17s. 6d. post paid. Order now; the above are in stock. C.Q.—the Amateur magazine published in the U.S.A. subscribe now, only 17s. 6d. for 12 large monthly issues.—DALE INTERNATIONAL PUBLICATIONS, 105 Bolsover Street, London, W.1. [206]

CLEARANCE SALE—New components at bargain prices. Volume controls, chassis, speakers, coils, pick-ups, ganged condensers, transformers, knobs, switches, etc. Bargain hunters send S.A.E. for list.—ADAMS (G2YN), Radio Works, Wilton, Salisbury. [202]

C.N.Y.I Wanted. Power unit (12v preferred but not essential) and receiver unit. Will trade Control and/or other units, plus chassis and leads. Alternatively will pay cash.—EVANS, 32 Cable Road, Hoylake. [205]

CONDENSERS—New 4 uF, 1500 VW, blocks (TCC), 6s. 6d., carriage paid.—GM3AKM, 57A Home Street, Edinburgh, 3. [224]

EX-GOVT. Components, etc. Oscillator units, contain 2 CV6 U.H.F. Triode, U.H.F. split-stator var. condensers, 1 DI television diode, 10s. 1uF 1,000v. working condensers, 1s. Approx. 15pF. split-stator var. condensers, 2s. Valves, guaranteed, SP41 3s. 6d., DI 3s., CV6 4s. Rotary transformer, 24v. D.C. to 480v. 40mA, 10s. 6d., post 1s.—M. A. WESTON, Harman's Cross, Corfe Castle, Dorset. [187]

FOR SALE—75/100 watt Amplifier or Modulator. Microphone/gramophone mixer input, push/pull driver, 4XKT66s, 600 ohm line output. 2X5U4G power supply. Rack mounting, weight 1 cwt., £20.—BRS17182, 67 Knightthorpe Road, Loughborough, Leicester. [234]

FREQUENCY Meter. Sell Navy type G73. Built in A.C.230 pack, use as Y.F.O. signal generator. Frequency meter, 100 kc/s.—25 Mc/s. Attenuated output. MOD or C.W. with internal 1,000 kc/s. calibrator, new, offers £14 with charts. 100 kc/s. crystals, '02, new, 12s. 6d. each. Write only S.A.E.—GABRIEL, 10 Abbotsford Place, Glasgow, C.5. [235]

G5AD Professional Communications Engineer, offers unrivalled service in repairs, overhauls, calibration of communication receivers, transmitters, frequency meters, oscilloscopes, etc. Rapid service. We supply anything radio. Try us and take advantage of free technical advisory service. Send for Lists.—G5AD, RADIO & AERIALS (Preston), 19 Victoria Road, Fulwood, Preston. Phone 79051. [178]

HAMFEST—R.S.G.B.S., Slough, at Crown Hotel, High Street, October 3. Book the date. Details later. [238]

HALLICRAFTERS Sky Champion, 550 kc/s. to 43 Mc/s. crystal filter, revalved, overhauled, perfect condition, £25. RME DB20, preselector, self-powered, as new, £15. Circuits, etc., available.—G2BVN, 51 Pettit Lane, Romford, Essex. [214]

HALLICRAFTER Sky-Chief, complete modification and peaked by 2AXQ, really hot; perfect on Ham bands. Sell £18, or exchange 107.348, accumulator operated.—H. R. WALKER, G2AXQ, 3 Chapel Street, Wilshech, Cambs. [225]

HAM has lots of gear for sale or exchange, all cheap, stamp list.—Wanted £13's, 805's, will pay 21s. each, and 35T's 15s. each.—Box 236, PARRS, 121 Kingsway, London, W.C.2. [236]

HAMMARLUND super-pro table model, 100-400 kc/s., 2-5 Mc/s., with handbook, good condition. No power unit.—Offers to HOPPER, 105 Chiltern Road, Dunstable, Beds. [236]

H.R.O. Power Supply, speaker, 7 coils, £55 0s. 0d.; B2 Transmitter/receiver, £15 0s. 0d.; 35 watt transmitter, £15 0s. 0d.; Franklin VFO 68R7, 6K7, 6F6, power supply, £15 0s. 0d.; T20, 10s.; RK34, 10s.; 805 with bases, 30s.; 1147, £10 0s. 0d.; 66 Bells, £2 0s. 0d.; 38 Television S.W. Worlds, £2 0s. 0d.; 66 Wireless Worlds, £3 0s. 0d.; £100 the lot.—Box No. 185, PARRS, 121 Kingsway, London, W.C.2. [185]

LARGE selection wireless sets, receivers and transmitters. Connections, transformers. Voltage regulators, fuses, fuse boxes, suppressors, cable, 1 to 14 core; Bell wire, single and twin.—ROBERTSON (Edinburgh), 43 Giles Street, Edinburgh 6. [236]

METAL Rectifiers Mains input, 12v + 12v output, 30s. Similar 120v output £1, vibrator rectifier less vibrator 6V input 230V 100 mA. output, 35s.; Chad Valley phones, 35s. set, headphones 2s. 6d., H/D keys 2s. 6d. Please add carriage.—GELL, Redhill Road, Arnold, Nottingham. [154]

MODIFIED R1155, internal A.C. power unit, output stage, energized speaker in separate cabinet, £14. Carriage extra.—SIMMONITE, Boundary House, Hatfield Road, Potters Bar, Midx. [236]

NATIONAL H.R.O. Power Pack and Speaker, £32 10s. National SIX A/C 5 Ham bands, £25, two wavemeters type 1,117 250 mA Ferranti, £3 each. Trophy 5 just realigned, £9. Avo model 40 needs attention, £7 10s. Please add carriage.—GELL, Redhill Road, Arnold, Nottingham. [141]

NATIONAL H.R.O. Senior, rack mounting, with power pack and five coils (10M coil handspread). In perfect order, recently re-valved and re-aligned, £40.—Box 217, PARRS, 121 Kingsway, London, W.C.2. [217]

NATIONAL 8 v. Superhet Crystal, 3-5 to 30 Mc/s. handspread, separate power pack, offers around £12. Crystals 3-5 and 7 Mc/s. bands, 20s., 15s.; LS 50's, 20s. Super parcels useful components, 12s. 6d.—G2ABK, Hundleby, Spilsby, Lincs. [230]

PAPER Condensers. 2-4 uF 3,000 v., 1 uF 800 v., 4 uF 800 v., 8 uF 500, 8X2 uF 500 v., choke 15H 400 mA. Savage mains transformer, two keys. Magnavox 8-in. speaker, R1155, 6V6 OP, Lissen A.C. 4 v. 305, Phillips 6 v., G.E.C. 6 v., rack mounting (no valves), 36 valves—U50, U52, PX25's, etc. Offers to clear.—Box 216, PARRS, 121 Kingsway, London, W.C.2. [216]

PORTABLE AC/DC 15 watt amplifier 2 speakers, £18; Mobile Trix 20 watt amplifier, 12 volt with AC mains power pack, nearly new, £20; C.D.P. Disc Recorder complete with operating desk, fitted amplifier fully metered. Playback speaker, etc. Whole outfit, £65. Carriage extra.—G3BML, 4 Queen Marys Avenue, Basingstoke. Phone: 479. [186]

QSL's and log books (P.M.G. approved). Samples free; state whether G or BR5.—ATKINSON BROS., Printers, Elland. [236]

R.F. Amplifiers type 2 ex-Navy type B2 transmitter, TX P.P. output P.A. stage (less valves) 50 watts carrier covering 100-146 Mc/s. Phone monitor, 2 meters, requires 1,000V. H.T. 2 valves VT62, 1-6J5, operating and circuit diagram supplied, new £4 10s. 0d. each, less valves, 3s. 6d. carriage.—WILFLO PRODUCTS, 160 McAslin Street, Glasgow. [197]

R132A 10 Valve communications receivers, 100-124 Mc/s., complete with separate A.C. power pack. Both units in transit cases. New. Circuits supplied. £7 19s. 6d. per pair, (carr. and packing £1). Receivers only, £4 19s. 6d. Power packs £3 10s. 0d. (add 10s. carriage and packing).—M.O.S., 3 Robert Street, London, N.W.1. [207]

R1155, good order, D.F. valves removed, working, £7. 6 ft. standard rack, all panels, chassis, etc., new, grey cellulosed, £10 complete. Pifco Radiometer, 12s. 6d. E.F. 50's, 3s.—G3CDW, 3 St. Margaret's Road, Hoylake, Cheshire. [203]

R1155—Internal power pack, output stage, fitted 19 in. x 10 1/4 in. front panel, suitable rack mounting. Complete with streamlined case, finished light cream, £20 or near offer.—BR6383, "Greenways," Rainsford Lane, Chelmsford, Essex. Telephone 3069. [175]

R1155 Model "F" receiver for sale, modified for 1-7 band, £9.—G3M3BCX, 16 Crombie Terrace, Dundee. [208]

R1155, 6V6 output, D/F circuits removed, new front panel, "S" meter, H.T. and L.T. switch, phone and L/S jacks, matching 8" P.M. L/S, all in black polished cellulose cases. Requires 220v. 90 mA., £20.—ELLIS, 16 St. Botolphs Road, Sevenoaks, Kent. [188]

R1481 New unused in transit case, £6 5s. 0d., or exchange for gram unit, G3CND.—F. W. T. S. Hostel, Stoney Cross, Hants. [236]

SALE—Army 12 transmitter complete, £25. Receiver R107, £17. Both excellent condition.—G3SO, 662, Western Boulevard, Nottingham. [176]

SALE—As new. Class D Wavemeter (Modified 230V A.C.), £5. No. 58 transceiver (6-9 Mc/s) with vibrator unit, accumulators, two pairs of phones and microphones, telescopic aerial, £9. *Thomas Valve Oscillators*, 15s.; *Harvey Thermionic Tubes*, 13s.; *Parr C. R. Tube*, 10s.; *Sturley Receiver Design*, Pt. 1, 20s.—MURPHY, 1 Marina Drive, Dartford, Kent. [200]

SALE—One pair Selsyn Motors as new, to turn your beam, £6, or near offer. 2 Cossor double beam oscilloscope tubes, £5 each. P.T. 15's, £1 each.—Box 201, PARRS, 121 Kingsway, London, W.C.2. [201]

SALE—R1481 Receiver, modified 50-62 Mc. Power supply, noise limiter, new condition in transit box; Hunts C.R.B. cap-resistor bridge, brand new condition; complete C.R.O. 24 in. tube, power supply, controls. Also quantity of good radio gear.—G3SN, 7 Sidwell Terrace, Exeter. [171]

SALE—Transmitter Unit 54A. 30W ECO 2 x 807, 2-4 to 6-7 Mc Thermo-Oven hand calibrated—Panel Scratched £4. Rothwell Crystal P.U. Boxed £1 10s. 0d. Valves DA 60 new £1 5s. 0d. each, 4 MF 4000 V.D.C.W., 7s. 6d. each. 20 W Modulation transformers pp 6L6 to 1 x 807, 15s. each. WANTED.—RCA 815 or 829B—exchange considered.—WRIGHT, 86 Clapham Lane, Rawmarsh, Rotherham. [177]

SALE—C.N.Y.I. Complete Q.R.P. station; and MK II, class D, wavemeter, both perfect, £20, or separate offers.—G3BWH, 50 Hardman Avenue, Rawtenstall, Lancs. [226]

SALE—BC342, complete with speaker, phones and auto transformer, £18 or offers?—Lesley Cottage, Elm Park, Stanmore, Middlesex. [233]

SELLING UP. 100 valves, 8 receivers, all transmitting and receiver components, aerial gear, electrical equipment, books, S.A.E. for list.—128 Uxbridge Road, Kingston. [199]

SURPLUS to requirements. R1155 receiver, like new, complete with Power Pack, speaker, and output stage, in separate matching cabinet, with spare rectifier, in crate, bargain, £15.—BRS 14675, W. D. ROBERTSON, "Ardmor," Lewis Street, Stranraer, Scotland. [196]

TABLE Stand Crystal Microphones, good quality, high output, £3. Mains twin round cable, 100ft. 15s. Oscilloscope units less CR tube, 10s. Carbon table stand microphones, 10s. Shaftesbury, £8 8s. 0d. Crystal microphones, 5s. Model ships engine, brass, £25. 12" diameter reflector lights, £3. Postages extra.—Trade lists available.—G6HP, Canning Street, Burnley. [236]

TRANSMITTER 100 watts input 6V6. CO. 829 P.A. 4V superhet CW, phone 40 and 80 metres microphone, spare key, in carrying case, requires 400V power supply, £10.—G3ABC, Finedon, Northants. [194]

T1115 Coils (fitted boxes).—20-176 metres, 25s. for 10 (or send requirements). Few R1116 famous "air-tested" battery sets, £11 (new valves), line case; leaded, 3d.; 4 uF 2,000 v. condensers, 12s. 6d.; 9 ft. heavy braided 4-leads microphone cables, 4" D. 5s. 6d.—BARNES RAD-ELC. Co., 12 Pipers Row, Wolverhampton (Central). [223]

UNUSED Valves.—ECH35, EBC33, ATP7, 5s.; ARP35, 6H6, 3s. 6d.; ARP36, PEN45, 12K8, 12SK7, 12A6, 354, 3A4, 185, 1A3, 6J5, 6C5, 4s. 6d.; PT15, 5s. 6d. BC221 frequency meter and case, £10. Triplet model 650, A.C. O.P. meter, £3 complete. 8-in. Kola, P.M. with O.P. transformer, 14s. 6d. 3 1/4 P.M. with O.P. transformer, 9s. 6d. S.A.E. list.—Box 219, PARRS, 121 Kingsway, London, W.C.2. [219]

URGENTLY required, a 12B8GT Valve.—Offers to G3AP, 21 Stafford Road, Sheffield, 2s. [216]

VALVES—DET20, E1148, 7s. 6d.; 6B8, 10, DC/SG, AC/SG, 6s.; KTW61, KTZ73, 6K7, 7s., SP41, 5s.; DDT13, 2051, 4s. 6d.; 6J5, 3s. 6d.; EB34, 2s. 6d.—BRS, 12,383, 20 Denison Close, East Finchley, N.2. [182]

VALVES—New and guaranteed types: 185, 1T4, 2X2, 6AC7, 6F6G, VR150/30, 884, 1299A, 7s. 6d. each. 5PG1, CRT with in double munet box, pair 304TH, pair 813, (6) 807 new and unused.—Offers to Box 213, PARRS, 121 Kingsway, London, W.C.2. [213]

VALVES—4 RK38's at £3 each, new. Jenkins & Adair condenser. Mike in case with head amplifier, £2 10s. 0d.—MATHEWS, 90 Tolmers Road, Cuffley, Herts. [192]

VARIABLE Selectivity I.F. Transformer, 465 kc/s. Three degrees selectivity. Wound Litz wire on Polythene former, 12s. each. I.F. transformer with balanced centre tap primary and secondary windings, for A.F.C. or crystal filter circuits, etc., 12s. each.—RADIO COMPONENTS, East Street, Darlington. [227]

WANTED—B2 Transmitter/Receiver complete with coils and P.P. Must be in perfect condition. State price, etc.—Box 237, PARRS, 121 Kingsway, London, W.C.2. [237]

WANTED—Valves VT116B, VT116 or VT116B, VT167 and crystal Ref. 19, for BC-221-T frequency meter.—Write, G3CON, 1 Rushleyaze Road, Lydney, Glos. [190]

WANTED 230 A.C. Power Pack for Collins TCS 12 transmitter/receiver. Rectifier type not rotary generator. Must be in first class condition. State price, etc.—Box No. 195, PARRS, 121 Kingsway, London, W.C.2. [195]

WANTED—1,000 kc/s. Crystal for American BC221 Frequency Meter.—Please write stating price to J. K. CARTER, Brook House, Cardington, Nr. Church Stretton, Salop. All letters answered. [215]

WESTINGHOUSE Rectifiers 250V. 120 mA., 6s.; Meter Rectifiers 5 mA., 2s. 6d.; Mercury switches 10A, 2s. 6d.; Relays 15 mA., 1s.; Meters 2 1/2", 15V. AC/DC, 5s.; 7.5V AC/DC, 5s. 6d.; 300V MC, 10s.; 10mA. MC, 3s. 6d.; New unused Avo oscillator AC £11 10s. 0d.—MASSEY, 58 Wakefield Avenue, Hull. [185]

W1191 Frequency Meters, 100 kc/s.-20 Mc/s., 8 bands continuous, screened oscillator and attenuator for receiver alignment, 1,000 kc/s. crystal CW or MCW, pierce oscillator to radiate any crystal gear. New, unused—spare valves, in transit case, £9 9s. 0d. C.W.O. Carr. Paid. Why pay more?—G3ADD, 13 Derwent Avenue, Headington, Oxford. [191]

£20 Cash offered for HRO or similar. Sell Audio oscillator, £20 cycles to 35kc/s 230v with output meter, etc., £10; Eddy-stone 5/10 converter, £8; Series 100 test set, £7; German valve tester, £5; BC348Q, 230V A.C., exceptionally good, with speaker, £20. Carriage extra.—BRS16522, 21 Ford Road, Arundel, Sussex. [210]

813 H.T. Transformers, 1450-1250-0-1250-1450 at 500 mA. 4 v., 5A with 1/2 power taps on primary, also 12 in. Bakers 2,000 ohm speaker, £3 each.—G3BEQ, 43 Cannore Gardens, Streatham, S.W.16. [220]

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(announced in August, 1947 issue)

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Cheques have been sent to the successful entrants, and all other photographs submitted are being returned. We wish to thank members of R.S.G.B. for the widespread interest shown in the Competition, and to express our appreciation of the general high standard of the entries.

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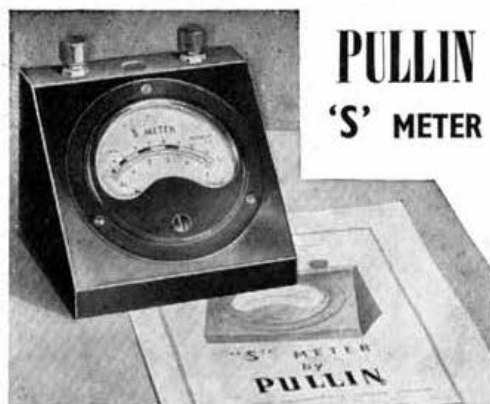
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