R·S·G·B

AMATEUR RADIO

# BULLETIN

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# R.S.G.B. BULLETIN

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## BRITISH v AMERICAN

THE Overseas Section of the Essay Competition recently organised by *Stratton & Co., Ltd.*, of Birmingham, has brought to light many interesting facts which should be made widely known to those sections of the British Radio Industry who are desirous of extending their home and export trade.

Almost every entrant who chose to discourse on the relative merits of British and American communications equipment paid a tribute to the sturdiness and reliability of British equipment and praised the ingenuity of British scientists and designers. That said, criticism of British methods generally followed.

Absence of standardisation by British valve manufacturers is a bone of great contention, although the comparatively recent introduction of British-made octal base valves should help to popularise British types. The arrival in Australia and New Zealand of the EF50 is heralded as one of the first serious steps taken by British manufacturers to influence development in those countries.

A criticism that makes strange reading is that the higher gain of British valves, as compared with American types, is often blamed for circuit instability. Replacement difficulties are also commented upon and the suggestion made that more care should be taken to ensure sound mechanical construction. Noise has apparently been the cause of much trouble in the past, and it is hinted that British valve manufacturers have yet to "live down" that complaint.

Components too come in for criticism. "British makers," wrote one essayist, "produce components of first-class quality which nevertheless offend with weak mounting brackets, badly placed terminals, clumsy un-functional appearance and insecure assembly." Hard words, but from our own experience not wholly unjustified: "British manufacturers," says another, "must realise that electronic gear is nowadays built on metal chassis and wired with soldered leads, not connected up bread-board fashion with a pair of pliers."

British communication-type receivers are at present almost unknown in many parts of the world, although it would appear that overseas amateurs recognise the great problems which face our manufacturers. The durability of British equipment is acknowledged but against this is the opinion that most amateurs will want to make a change anyhow within 15 years —which seems to be about the useful life of an American receiver.

"All amateurs are inherently vain," wrote one competitor, "where the shack is concerned—and an attractive exterior, while admittedly of no technical value, is a great boost to station ego. American receivers are more satisfying in this respect and, in general, 'catch the eye' more quickly than the plainer English types."

Whilst the British manufacturer comes in for a fair share of criticism some blame for the apparent lack of interest in British communication equipment is directed against the technical press. "Nearly all the radio publications from England," wrote one prominent New Zealand amateur, "are uninteresting. Articles, often undeniably good, are presented in a style which is not attractive to the modern reader." English circuit diagrams are criticised, as is the tendency to publish extensive theoretical treatises without adequate practical information.

American technical articles, it is suggested, evoke a "spirit of optimism" as they give the reader a feeling of confidence that he will succeed in building the piece of gear described.

Most writers agreed that in the field of advertising the Americans unquestionably lead. They glamorise their equipment when they advertise it, and their announcements shrewdly drive home the point that the reader *must* have a particular piece of equipment in his station. Factual data, attractively presented, is designed to convince the reader. British advertising lacks "pep" and is not prepared with a full appreciation of the reader market.

In spite of the critical comments levelled at John Bull there seems to be little doubt that many overseas amateurs share the view of one essayist who wrote: "There is, at least in the Dominions and probably in other parts of the world as well, a great fund of goodwill towards the British people and many users are pre-disposed to the purchase of British equipment in preference to American."

British manufacturers and their advertising agents would do well to react favourably to that sentiment. British radio equipment is the best in the world but as a Nation we seem reluctant to admit it. J.C.

## *In this issue*

# SIMPLE FREQUENCY DETERMINATION FOR THE 420 Mc/s. BAND

By W. A. SCARR, M.A. (G2WS)

TO take up U.H.F. work without simple frequency measuring apparatus is like setting out to sea without chart or compass. Even if all apparatus is crystal controlled, the need for a frequency measurer remains, for the selection of crystal harmonics in both transmitter and receiver calls for a reliable, if not highly accurate, wavemeter.

This article describes the construction of an absorption wavemeter to cover the 420–460 Mc/s. band, using a simple oscillator and Lecher wires for making the calibrations.

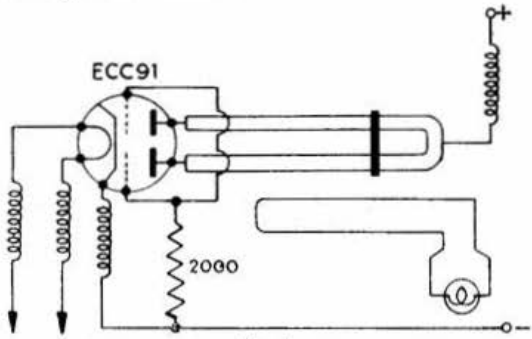


Fig. 1.
Circuit diagram of simple U.H.F. Oscillator using *Mullard* ECC91 button-base double triode.

## The Oscillator

There are, of course, many circuit arrangements which will provide the basis of a simple U.H.F. oscillator and the choice may therefore be decided by simplicity of construction and minimum requirement of components. A suitable valve for the circuit, which will oscillate readily up to 500 Mc/s., is the *Mullard* ECC91, button-base double triode.

The circuit diagram (Fig. 1) and photograph (Fig. 2) will make a detailed description of the construction unnecessary. The only feature which should be copied fairly closely is the inductance, which is a " hairpin " of silver-plated copper tubing or wire about $\frac{1}{8}$ in. diameter and soldered directly to the valve-holder sockets. The spacing between the two inner sides of the hairpin is $\frac{3}{8}$ in. The frequency of oscillation is varied by means of a slider consisting of a short piece of hard-drawn copper or brass wire bent round the two sides of the hairpin to slide fairly stiffly along its length, thus short-circuiting the remote end. The loop of wire from the fuse-bulb holder for indicating oscillation

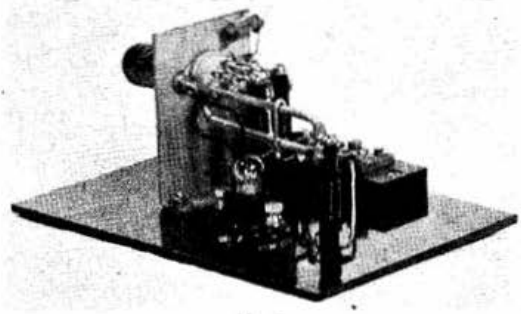

Fig. 2.
Photograph of the U.H.F. Oscillator shown in schematic form in Fig. 1.

is mounted opposite the " hot " end of the hairpin and should be loosely coupled about $\frac{3}{4}$ in. from the inductance. The R.F. chokes, which may be self-supporting or wound on narrow formers of ebonite or paxolin, each consist of approximately 10 in. of enamelled copper wire. Suitable plate voltage for the oscillator is between 150 and 200 volts. The range of frequencies obtained by varying the position of the shorting bar is approximately 375 to 520 Mc/s.

## The Lecher Wires

Many V.H.F. enthusiasts will already have constructed apparatus on these lines for direct measurement of frequencies and the use of the Lecher wire bridge is described in other R.S.G.B. publications.

Obviously the length of the bridge may be reduced for very short wave-lengths and with measurements around the 400 Mc/s. mark in view, the frame need not be more than four feet long. The photograph of the instrument made by the writer (Fig. 3) shows the method of construction. Features of particular note are the stout metal shorting bar, a piece of sheet metal filed to a sharp edge and cut to provide a pointer which moves along the boxwood metre scale screwed to the side of the frame, and the two wires stretched over the frame which should be supported only at their ends and by the bridge and are kept taut by means of stout spiral springs from which they are separated by small insulators. The wires themselves are of No. 20 copper wire and should be mounted exactly parallel and not more than one inch apart.

The coupling loop should be quite rigid as its position must not vary while measurements are in progress. One-eighth inch diameter copper tubing was used in the original model.

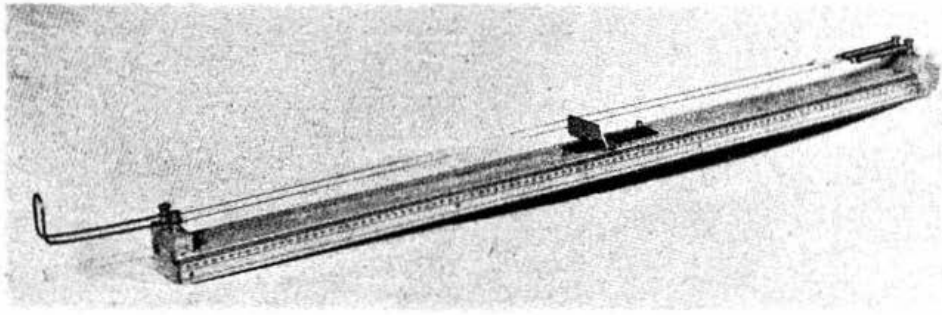

Fig. 3. Lecher wire bridge, designed for measuring very short wave-lengths.

## The Absorption Wavemeter

The usual coil and condenser type of absorption meter, familiar in the lower frequency ranges, is still effective up to about 600 Mc/s. if suitable components are used. Above 400 Mc/s., the coil becomes a simple loop of wire or tubing or even a curved metal bar. For the frequency range we are considering, a piece of $\frac{1}{8}$ in. diameter copper tubing 4 in. long is used, the two ends being soldered to the pairs of stator plates of a midget split-stator condenser (obtainable from ex-Government disposals), each half of which has a capacity of about 9 $\mu\mu$F. No connection is made to the rotor plates. To minimise hand-capacity effects, the condenser is supported on a paxolin baseboard and provided with an extension handle, dial and pointer. The photograph (Fig. 4) shows the method of assembly.

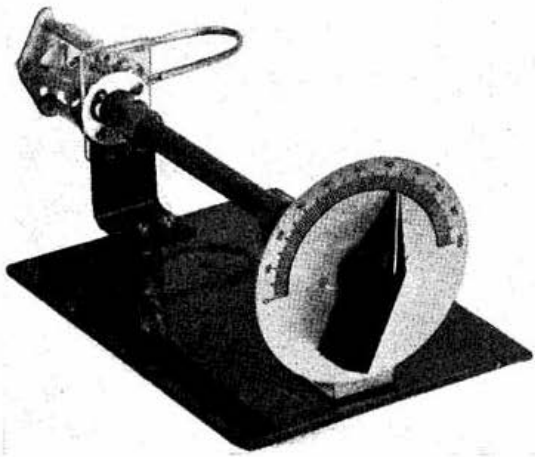

Fig. 4.
Absorption meter for measuring frequencies up to about 600 Mc/s.

## Calibrating the Wavemeter

Mount the oscillator firmly on the bench and connect up the power supplies. Bring up the Lecher wire bridge until the coupling loop is several inches from the oscillator inductance. Slide the shorting-bar up and down the Lecher wires and note the effect on the oscillator indicating bulb. Adjust the coupling until the blink of the lamp is only just discernible at the nodal points. Bring up the wavemeter and arrange this also at such a distance from the oscillator that turning the condenser through resonance has just sufficient effect on the bulb to give a noticeable dimming.

With the wavemeter out of resonance, find two nodal points on the Lecher wires and measure accurately the distance between them. From these readings, the frequency of oscillation is measured by using one of the following formulæ:—

$$F\ (\text{Mc/s.}) = \frac{5906}{\text{length in inches}}$$

$$F\ (\text{Mc/s.}) = \frac{15{,}000}{\text{length in centimetres}}$$

Detune the Lecher wires (without moving the whole apparatus) and adjust the wavemeter for resonance. The dial reading corresponds to the measured frequency.

Move the slider along the oscillator inductance a short distance and take another set of readings. Repeat at various positions until sufficient data is obtained to enable a Frequency/Dial-reading graph to be drawn for the wavemeter.

A useful check on the accuracy of the wavemeter can, of course, be made if a crystal-controlled oscillator is available working in the 420 Mc/s. region. The writer has found no difficulty in constructing a low-power tripler from a 144 Mc/s. crystal-controlled oscillator using either an ordinary V.H.F. triode or a C.V.53 grounded-grid triode.

In using the wavemeter, it should always be remembered that accurate readings will only be obtained if the coupling between the meter and the apparatus under examination is as loose as possible.

# NEW MILITARY RADIO EQUIPMENT

SOME of the latest developments in military signals equipment were shown to representatives of the Armed Forces, the Radio Industry and a limited public during the recent "open days" at the Signals Research and Development Establishment, Ministry of Supply, Christchurch, Hants. The demonstrations proved that the vital importance of providing the British Army with completely reliable and up-to-date radio equipment was one of the major military lessons learned during the last War.

To design army equipment is the responsibility of the S.R.D.E. whose history dates back to 1904 when the Wireless Telegraphy Experimental Establishment was formed to exploit the military application of radio. Perhaps the most outstanding of its many achievements was the development of the now famous No. 10 set which provided multi-channel telephony communication by means of a pulse-width modulated centimetre beam. This set was successfully used during the Normandy fighting and the subsequent break-through to Germany.

At the S.R.D.E. a careful balance is maintained between the twin paths of scientific research and engineering development. The research worker must keep abreast with advancing scientific knowledge over a wide field so as to recognise possible applications to military communications of often seemingly unrelated physical phenomena; while the engineering section must be ready to carry any project up to the stage where it becomes suitable for large scale production. To do this an efficient drawing office and fully equipped workshops must be available. A military unit is also attached to the Establishment in order to carry out field tests and to advise the scientists on Army signals procedure.

## New Equipment

The new apparatus shown proved that the majority of the standard sets which became so well-known to all branches of the Signals between 1939 and 1945 are now regarded as being in the nature of museum-pieces. Generally speaking, emphasis has been placed on the reduction of weight and size of equipment and on the thorough testing of components under stimulated battle conditions in all climates.

A mock-battle was staged to show the potential value of the new No. 88 portable transmitter-receiver designed for the Infantry and for air-liaison and armoured support. This 14-valve V.H.F. frequency-modulated set weighs only 11$\frac{1}{2}$ lbs. complete with batteries and is carried in normal ammunition pouches. With a range of from 1$\frac{1}{2}$ miles across country to 100 miles to aircraft in flight, this walkie-talkie is a far-cry indeed from the bulky pre-war models which, according to the handbook, were to be carried

on the broad back of a mule or an intelligent N.C.O. Although each set operates on four switched channels determined by a crystal-controlled local oscillator, controls have been reduced to a minimum. A functional test set for the No. 88 has been developed to facilitate routine checking in front-line areas without the necessity of breaking radio silence.

Visitors were also given the opportunity to test the new multi-channel V.H.F. radio link which provides eight telephony circuits over distances up to 40 miles. A 3-element—or Yagi—beam gives the installation a familiar appearance to the amateur. Although at first sight, the facilities afforded by this set may seem to be similar to those of the No. 10 already mentioned, in fact the system employed is entirely different. One important advantage is that the speech inputs are combined on a frequency division basis in a normal line carrier vehicle which can modulate the V.H.F. transmitter over several miles of wire, the radio link behaving merely as a line repeater.

The "new look" which has crept into radio receivers, due to the extensive use of miniature valves and components, could be noticed in the general purpose communications receiver type R209. Originally designed in 1943 to replace the much larger but electrically similar R107, it was the first set to be fully tropicalised and hermetically sealed against moisture. A receiver was shown operating fully immersed in water and OH2RE might be surprised to learn that his 14 Mc/s. signals were logged at good strength under these conditions. Another very attractive feature of this set is the plug-in unit construction of the I.F. and B.F.O. stages permitting easy replacement should a fault occur in the field.

## Mechanical Tests

Great attention is paid at the S.R.D.E. to mechanical and durability testing of components and equipment and many ingenious tests have been devised. In special chambers, the long-suffering equipment is subjected to damp-heat, low temperatures, sand storms and driving rain. Should the equipment emerge triumphantly, it still has to face almost incredible mechanical ill-treatment; vibration, bumping, cable-flexing and a hundred other tests of durability. The culminating effort, apparently, consists of dropping the entire equipment a matter of some 4 ft. 6 in. on to a concrete platform. Try that on the new V.F.O. at your own risk and peril.

The increasing importance of frequency-shift radio teletype is fully recognised. With this system, the continuous radiation from a transmitter is shifted slightly from its mean frequency to provide the "mark" and "space" pulses of normal line teleprinter operation. Used primarily for long distance communication it possesses the advantage that the receiver volume control can be made as fast-acting as desired while the capability of the signals to override noise is remarkable. An adaptor, shown coupled to a standard receiver unit, has been developed to permit diversity reception and reduce frequency drift. It was noteworthy that in the course of the demonstration, during which a European commercial circuit was monitored, perfect copy was taken although the receiving end of the link was forced to ask for many repeats.

## Research

It would be impossible to cover adequately the many aspects of the research constantly being carried out by the S.R.D.E. The radio control of missiles and the investigation of rocket behaviour in the upper atmosphere; the use of speech-clipping to increase intelligibility under noisy battle conditions and improvement of noise-exclusion characteristics of headphones; application of radar pulse techniques to locate faults and intermittent shorts on lines or cables; and the possible use of nuclear resonance effects to control the frequency of radio equipment were but a few of the projects shown. Power supplies have long been a critical factor in field operation and considerable research is devoted to this subject. Vibrator design, in particular, appears to offer opportunities for early modification. Of considerable historic interest was a collection of crystal units developed for military use between 1928 and the present day. Members will readily appreciate the difficulty of complete tropicalisation of crystal holders and many clever devices have been tried in order to make crystals impervious to mechanical shock.

To sum up, the visitor to S.R.D.E. is left with a vivid impression of the desire of the staff to provide the army with the best possible equipment. An active Amateur Radio Club—affiliated to the R.S.G.B.—is typical of the spirit of the entire establishment. The traditional keenness of the war-time boffin has not disappeared with the cessation of hostilities and it is to be hoped that the military authorities will show an equal accommodation towards new ideas and techniques. In this connection, the importance of the radio amateur cannot be over-emphasised. For at a time when the art of radio has advanced beyond the understanding of the average man-in-the-street, the amateur must help form an enlightened public opinion ever watchful to ensure that improved communications equipment is not only designed but actually reaches the field units of the British Army.

J. P. H.

# New Distance Record on the 2350 Mc/s. Band

ON Sunday, September 19, Messrs. Noel Bevan, G8IH, and Leonard Grimshaw, G3CBN, established two-way communication over a distance of 13 miles during an attempt to exceed their previous range of two miles set up in June this year, and recorded in the July issue of the BULLETIN.

By kind permission of the Worthing and District Amateur Radio Society, the fixed station was established at their H.Q. in High Salvington, and contact first made with the mobile 12·9 cm. set at Lancing. Over this distance of 5½ miles signals were R5 S7/8 both ways, with speech quality equal to a good land-line circuit. A move was then made to Brighton Race Hill for further tests where, on the arrival of the mobile station, contact was established with little difficulty, signal strength and readability over the 13 mile visual path being identical with that obtained at Lancing. G8IH and his party then proceeded to Newhaven Head, but conditions there as regards terrain were unsatisfactory, and with the absence of an unobstructed air line over the distance of 20 miles or so to High Salvington, it was hardly surprising that nothing could be heard.

G3CBN and 8IH were ably assisted by 2DVD, 3AJF, ASV, BFS, BIQ, BRL, BVG, DDF and DOG, also the members of both the Worthing and District Amateur Radio Society and the Brighton and Hove Group, R.S.G.B.

In the evening the visitors from London, and their ladies, were the guests of the Brighton and Hove amateurs at a social gathering at a hotel in Brighton, where an interesting demonstration was given of the apparatus used to establish the record.

We offer our congratulations to all concerned in this fine performance, and hope to be able to publish some photographs of the event in our next issue.

G2UJ.

# MODIFYING THE T.R.1143 FOR AMATEUR USE

By G. L. BENBOW, B.Sc. (Eng.), (G3HB)*

THE T.R.1143, recently obtainable under the Ministry of Supply disposals scheme, is a transmitter-receiver covering frequencies in the band from 100 to 125 Mc/s. Four crystal-controlled channels are provided in both transmitter and receiver, channel selection being made by switching-in the required crystal and turning the tuning condensers to pre-set positions by means of a system of rods and cams, actuated by a selector motor. Power is supplied by a rotary transformer running from a low-voltage D.C. supply.

There are four distinct units, *viz.*, the Transmitter, the Receiver, the Amplifier Unit and the Channel Selector Motor. These are all attached to a framework, forming the top of the case, which contains the inter-unit wiring and the channel-selection mechanism. The first three units plug-in to the framework by means of Jones' plugs, and are held in position by screws.

The complete equipment, as it stands, is not very suitable for amateur use, in fact it is quite useless without its associated connecting harness, controller and power supply. However, the individual units can be modified without much trouble to meet amateur requirements, and it is hoped that the following notes will provide sufficient information to interest readers who contemplate carrying out such modifications.

## The Transmitter Unit

As will be seen from Fig. 1, the circuit of the Transmitter is quite conventional, consisting of a Crystal Oscillator (EF39), 1st Tripler (EF39), 2nd Tripler (TT11), Doubler (TT11) and push-pull Power Amplifier (TT11's). Total frequency multiplication between crystal and output is eighteen times.

Apart from the addition of suitable knobs to the condenser-spindles, and conversion of the series-parallel (12 volts) filament connections to parallel (6 volts) if required, the only other modifications are in the sizes of the coils. Wide choice of crystal frequency is possible, for a given output frequency, as three stages of frequency doubling or tripling are available.

Although the transmitter is nominally rated to cover 100 to 125 Mc/s., its efficiency at frequencies as high as the 144 Mc/s. amateur band is rather low. The most useful application, as far as that band is concerned, is as a driver unit, providing an output at 72 Mc/s., to be followed, for example, by a QVO4–7 doubler stage driving a push-pull power amplifier (using an 832 or two QVO4–7's). Alternatively, the small size of the transmitter makes it ideal, with modification to the coils, for portable use on 60 Mc/s., or (with increased tuning and by-pass capacities) on lower frequencies, at inputs of up to about 20 watts.

An 0–1 mA. meter, plugged into the socket for that purpose, may be switched to various positions, as indicated in Fig. 1, to assist in tuning. Shunts are provided to give readings of approximately 7, 40, 40, 100 and 2·5 mA. on positions 1, 2, 3, 4 and 6 respectively, but readings will vary with different meter-resistances.

* *92 Cannon Lane, Pinner, Middlesex.*

## The Receiver Unit

This unit requires considerably more attention than the transmitter. The stages are: R.F., EF50; Mixer, EF50; 1st and 2nd I.F., EF39's; 3rd I.F., EF50; 2nd Detector and A.V.C., EBC33. The Crystal Oscillator is an EL32, and the Frequency Multiplier feeding the mixer an EF50. The triode section of the EBC33 is a D.C. Amplifier with an anode current relay for muting the receiver. Some models also employ an EA50 noise limiter. The intermediate frequency is 9·72 Mc/s. The valve heaters are connected in series-parallel, for 12 volts operation, but it is an easy matter to reconnect them in parallel for 6 volts operation if required.

The simplest way to operate the receiver usefully is to replace the fixed-frequency injection with variable-frequency injection, by converting the frequency multiplier stage into an oscillator. This can be done by connecting the EF50 as a triode and feeding the H.T. to the centre tap of the coil instead of to one end; this free end is then taken to the grid of the EF50 *via* a 100 $\mu\mu$F condenser. The crystal holders, the pre-setting mechanism and the crystal oscillator wiring may then be removed, leaving the EL32 available for use as an output valve. The triode section of the EBC33 may be used as a voltage amplifier between the diode and the output valve, or it may be used as a B.F.O. Fig. 2 is a circuit diagram of the receiver embodying these modifications and Fig. 3 shows the chassis lay-out.

The receiver can be made to cover the 58·5 to 60 Mc/s. band by increasing the number of turns on the coils to the following: R.F. grid, 7 turns; R.F. anode, 6 turns; Mixer grid, 6 turns; Oscillator, 9 turns. A good slow-motion drive is essential for the oscillator tuning condenser (rear section of the two-gang condenser), while a small epicyclic drive may be used for the R.F. and mixer tuning.

Although this is the simplest way to make the receiver function, it is far from being ideal. The large frequency coverage, and the fact that the tuning condensers rotate through only 90°, make for difficult tuning. To offset this disadvantage, a mechanical band-spread dial may be used, or some of the condenser vanes removed and the total capacity restored by parallel fixed condensers, in order to restrict the coverage.

A different use for the receiver unit, and probably its most useful application, is to act as the I.F., detector and A.F. stages of a V.H.F. receiver, the "front end" of which takes the form of a convertor for the V.H.F. amateur bands. The I.F. band-width of ± 40 kc/s., although it tends to make the receiver somewhat unselective at 60 Mc/s. can conveniently mask any normal amount of frequency drift in the local oscillator. The band-width may be improved slightly by removing the 100,000 ohm damping resistors across the primaries and secondaries of the I.F. transformers.

## The Amplifier Unit

This unit contains the Transmitter Modulator, Receiver A.F. Amplifier and Side-tone circuits, etc. It is probably the least useful of the major assemblies of the apparatus, except insofar as it contains useful

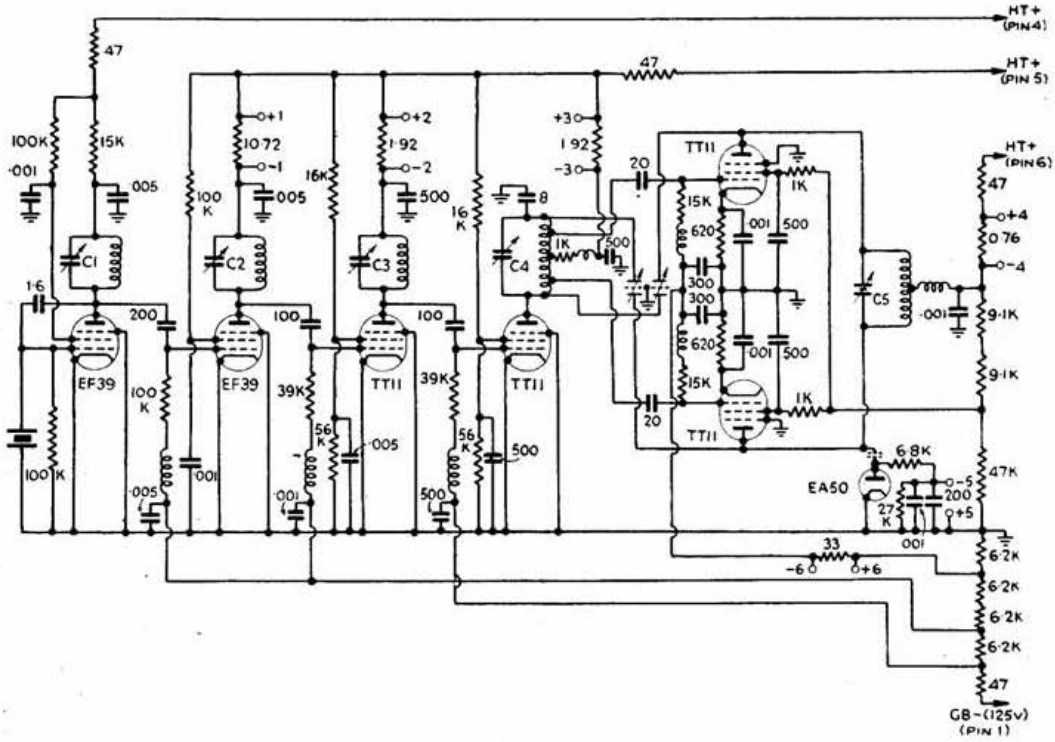


Fig. 1.

Circuit of the Transmitter Unit (Type 17). Capacities are all in $\mu\mu$F or $\mu$F, and resistances in ohms or kilohms. C1, C2 and C3 are 3·2–20 $\mu\mu$F, C4, 3·2–9·1 $\mu\mu$F, and C5, 2·8–6·1 $\mu\mu$F.

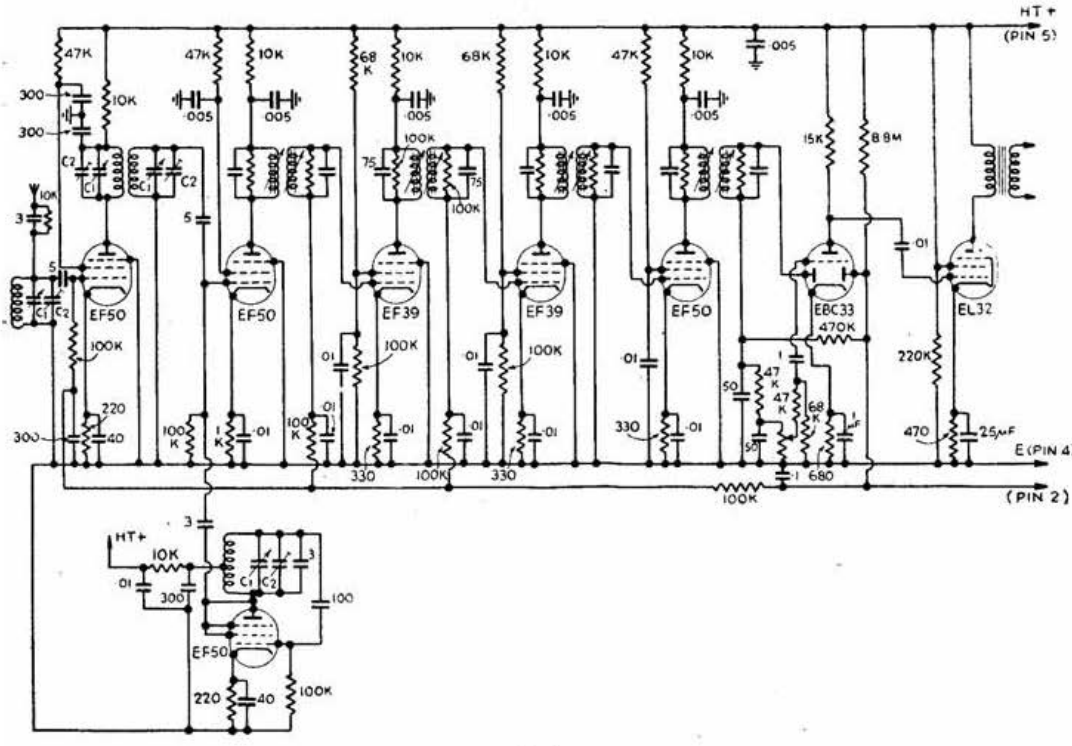


Fig. 2.

Circuit of the Receiver after modification. C1 is 4–16 $\mu\mu$F and C2, 2–6 $\mu\mu$F

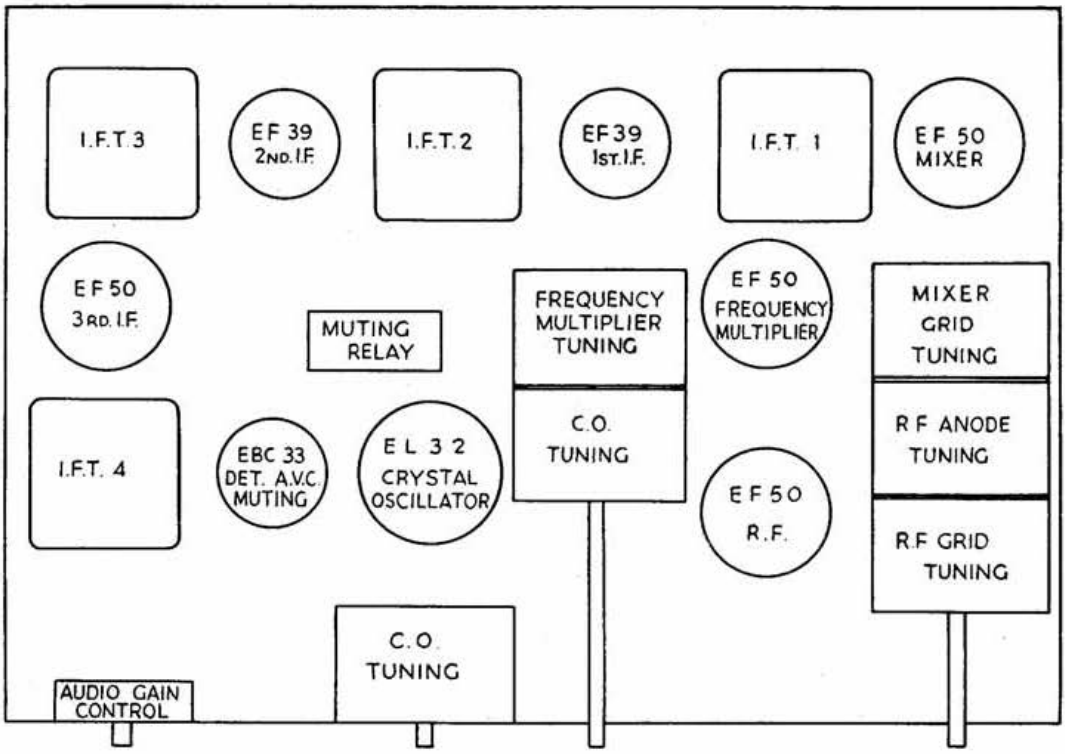


Fig. 3.
Chassis layout of the Receiver Unit (Type 19).

valves and components. In its original form, it consists of two separate amplifiers, the modulator (an EF36 feeding two push-pull EL32's) and the receiver amplifier (an EBC33 feeding an EF36). The wiring, however, is rather involved, and it is unlikely that it would be worth while, from an amateur point of view, to retain it.

It is hoped that these notes and the diagrams will be of assistance to readers who contemplate converting the T.R.1143 into a useful piece of equipment.

### E.M.I. Scholarships

In order to encourage young men to meet the need of the nation and of the Empire for technicians, *Electric and Musical Industries Ltd.* has decided to award two scholarships open to competition throughout Great Britain. The first scholarship covers the fees of a 3-year attendance course at *E.M.I. Institutes Ltd.* in Telecommunications Engineering commencing in April, 1949. This course is recognised by the appropriate authorities for government awards to ex-Service men under the Further Education and Training Scheme. It is also recognised as grounds for deferment of call-up to Military Service. The course will consist of two separate years at the E.M.I. College, with a year, sandwiched between them, spent in a carefully co-ordinated programme of practical training at the Hayes, Middlesex, factories of *E.M.I. Ltd.*

The second scholarship is for a special grouped postal course covering the City & Guilds Final Certificate in Telecommunications Engineering. This consists of four E.M.I. Institute postal courses. County Authorities throughout the country are being invited to nominate candidates for examination by the college authorities.

### Sutton Coldfield Television Station

The B.B.C. announces that work on the Sutton Coldfield television station is making good progress. The frequency to be used by the vision transmitter will be 61·75 Mc/s. and by the sound transmitter 58·25 Mc/s. In order to conserve frequency space, the upper side band of the vision transmitter will be partially suppressed. This will not affect the quality or strength of the picture, although it will be necessary for television receivers in the Midlands to be suitable for this form of asymmetric sideband transmission. The sound channel will be amplitude modulated. Power of the vision transmitter will be 35 kW and that of the sound transmitter 12 kW. Picture definition will be the same as from Alexandra Palace.

# ADJUSTING THE CLASS D WAVEMETER

By A. HARCUS CUTT (GM2BGH)*

THE "Wavemeter Class D, No. 1 Mark II" is a single valve, crystal check meter, with interpolating oscillator, covering the nominal ranges of 1900–4000 kc/s. and 4000 to 8000 kc/s. in addition to 1 Mc/s. check-frequencies. In actual practice it is possible to use the meter on all the amateur bands, although the harmonics tend to become rather weak on frequencies higher than about 14 Mc/s. The plug-in crystal holder contains two crystals (100 kc/s. and 1,000 kc/s.), one being suspended from its nodal point and the other (enclosed) mounted between two flat electrodes. The valve is an ARTH2 triode-hexode, the triode portion being normally used as a crystal oscillator working on 100 kc/s. while the hexode portion generates a carrier frequency variable over 100 kc/s., the actual ranges being 3,400–3,500 kc/s. and 6,100–6,200 kc/s. When used to provide 1 Mc/s. check frequencies the triode portion of the valve operates as a crystal oscillator at this frequency and the hexode portion acts as an amplifier, giving sufficiently powerful harmonics to cover the 28 Mc/s. band.

The great advantage of this type of meter is that the dial is direct-reading in kc/s. and the scale is very open. No verniers or graphs are required. Compactness is another feature, the unit measuring approximately 8½ in. × 7½ in. × 6¼ in. The power supply arrangements were described in an article on page 111 of the BULLETIN for December, 1947, which gave clear instructions for converting the meter to A.C. operation in place of 6 volts D.C. Without alteration it would make an ideal meter for use on Field Days, running from a car battery.

Some users have, however, found difficulty in adjusting one or both of the ranges so that the tuning control covers exactly 100 kc/s. The usual trouble is that, despite following the instructions given in the official instruction book, the dial reads perhaps 97 or 103 when the 100 kc/s. zero beat is obtained, with both inductance and capacity trimmers at the limits of their travel. The writer experienced this difficulty and found that it was due to the interpolation oscillator working on the wrong frequency. As stated above the fundamental ranges of the instrument are 3,400–3,500 kc/s. and 6,100–6,200 kc/s., but the trimmers may be so badly out of adjustment that the oscillator is working 100 kc/s. above or below these ranges.

## Method of Adjustment

Assuming that the inductance and capacity trimmers are at the limits of their travel, the correct adjustment may be obtained as follows:—

(1) Set the tuning dial to zero and adjust the "Zero Set" knob till zero beat is obtained on 'phones plugged into the instrument.

(2) Screw the inductance trimmer away from the extreme setting until a new beat note of normal strength is picked up in the 'phones.

(3) Turn the tuning dial to 100 and it will probably be found that the previous error has been much reduced or perhaps reversed.

Final adjustments can now be carried out according to the routine given in the instruction book, *i.e.*, adjust the capacity trimmer at the top end of the scale (highest frequency) and the inductance trimmer at the bottom end of the scale (lowest frequency).

* *4 Auchentrae Crescent, Ayr.*


A photograph of the Class D Wavemeter.

## Checking Against B.B.C. Stations

As the harmonics of the instrument cover a very wide range, it is easily possible to obtain readings against any of the medium or long wave broadcast stations. If the receiver is fairly sensitive the aerial should be disconnected and in its place a wire taken to the output terminal of the meter. This will give sufficient pick-up from the broadcast station but will prevent it swamping the weak harmonics from the meter. Useful checks are Droitwich on 200 kc/s. for the ends of the scale, and North of England on 1050 kc/s. for the middle of the scale. Intermediate settings may be checked against other stations. An occasional check of this nature gives a welcome assurance that all is in order.

### E.M.I. Institutes Ltd

Professor H. F. Trewman, Managing Director and Principal of *E.M.I. Institutes Ltd.* announces that many students of the Institute who sat for the May, 1948, Radio Amateurs' Examination were successful.

The Institute has a special postal course for the examination, details of which are available on request from the Principal, 43 Grove Park Road, Chiswick, London, W.4.

# MAINS VOLTAGE REGULATION

By L. BERGNA (BRS14342)*

WHEN the mains voltage varies it causes much hardship in the way of frequency drift, loss of sensitivity in the receiver, lowering of the power output of the transmitter, and—if the variations are large—a shortening of the life of valves. During the winter of 1946-47, the writer recorded voltages between 205 and 255, on a declared voltage of 240, and this article describes the method which was used to deal with the problem.

Mains voltage variations may be corrected by a simple arrangement of auto-transformer with tapping switch, as shown in Fig. 1. If the moving contact is arranged to short circuit two fixed contacts during a tap-change, then one section of the transformer is

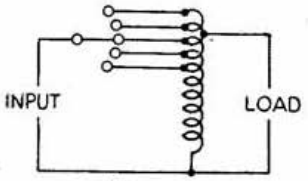


Fig. 1.
Mains voltage variations may be corrected by an auto-transformer with tapping switch.

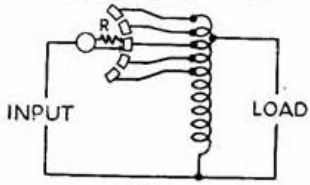


Fig. 2.
A more satisfactory arrangement employing a resistance R.

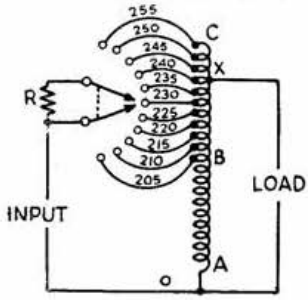


Fig. 3.
A complete voltage regulator using a resistance.

shorted and large currents circulate which must be broken by the switch at the end of the tap-change. This causes rapid wear of the switch contacts and, should the switch be left between two positions, a burn-out of the transformer will follow. If, on the other hand, the moving contact does not short-circuit two contacts during a tap-change, the load is open-circuited every time the switch is moved, which will also cause rapid wear of contacts.

The tapping switch shown in Fig. 2 overcomes these difficulties. During a tap-change one section of the transformer is shorted through a resistor R and the value of the circulating current is controlled by the value of R. At no time is the load open-circuited, and providing R is of the correct resistance and rating, no damage ensues from the switch being left between two positions.

## Voltage Regulator

The complete voltage regulator is shown in Fig. 3 and the method of design discussed below. The voltage is controlled by adjusting the tapping switch by hand in order to maintain the output voltage constant as read on the voltmeter.

As shown in Fig. 3, the regulator has 11 tappings, suitable for dealing with a voltage range of 205–255v. in 5v. steps. The voltage range and step voltage must be chosen to suit the reader's requirements, but a step voltage of 5 volts is recommended. The tapping switch is used on the input side of the transformer in order to maintain a constant flux density in the core.

Having decided on the voltage range and step voltage, each tapping may be marked with its own voltage, as in Fig. 3. These figures represent mains voltages, the load voltage being constant.

The rating of the transformer may now be calculated from:

$$W = VI$$

where $W$ = transformer rating, VA.
$V$ = step voltage x number of steps.
$I$ = full load current, amps.

The core may now be chosen, allowing 1 sq. inch cross section of iron for each 60 VA of rating. Having chosen the core, the turns per volt may be calculated, from:

$$t = \frac{5 \cdot 8}{A}$$

where $t$ = turns per volt
$A$ = cross-sectional area of core, sq. ins.

The number of turns between the start of the winding A, and any tapping is given by $t$ multiplied by the voltage of the tapping, in each case neglecting fractions of a turn.

The winding between B and C (Fig. 3) must be rated to carry the full load current. The winding between A and B carries a current given by:

$$i = \frac{1 \cdot 1W}{v}$$

where $i$ = current in winding AB, amps.
$W$ = transformer rating, VA.
$v$ = voltage of lowest tapping, volts.

The minimum size of wire for a given current is given by:

$$a = \frac{i}{2,000}$$

where $a$ = cross-sectional area of wire, sq. ins.
$i$ = current carried by wire.

Having determined the number of turns and size of wire in each section, the space occupied by the winding can be calculated. Assume that 40% of the available winding space is occupied by insulation and tappings, and the rest by the winding. Enamelled wire of the largest size that can be accommodated in the available winding space should be used and, if the winding space is insufficient for the size of wire calculated from the above formula, then a larger core will be required.

The coil should be wound on a former made of pressboard, or any suitable insulating material, and having inside dimensions slightly larger than the core. The winding should be in layers $\frac{1}{8}$in. shorter than the former, paper interleaving between layers being used. Paper condensers furnish ideal interleaving, providing all aluminium foil is removed. Flexible wire should be soldered to the winding for tappings and end connections, the joints being inside the coil and insulated from the rest of the winding. The complete coil should be taped before assembling on the core.

* 121, Addycombe Terrace, Heaton, Newcastle-on-Tyne, 6.

The above method of transformer design is considerably simplified, but is quite satisfactory for the present case.

## Construction of Tapping Switch

No difficulty should be experienced in making a tapping switch, or in converting an existing switch to suit. The moving contacts must be arranged so that normally they both lie on one fixed contact stud, and during a tap change, the leading contact must reach one stud before the following contact has left the previous stud. It must not be possible for one moving contact to short-circuit two studs. A switch suitable for a load of 5 amps. is shown in Fig. 4. The studs are 0BA brass cheese-headed screws and the moving contacts are phosphor bronze or springy brass $\frac{1}{32}$in. thick. Connections to the moving contact

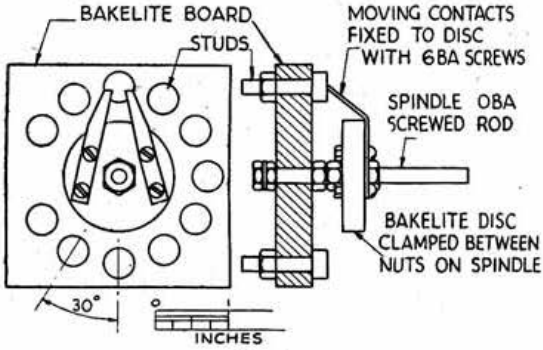


Fig. 4.

Illustrates the design of a voltage regulator switch suitable for use in amateur stations.

are made with insulated flexible wire and the switch is driven from a knob *via* a Yaxley type locator plate.

It is usual to allow a circulating current during a tap change equal to full load current. The values for R are then as follows:

$$R = \frac{V}{I} \text{ and } W = I^2R$$

where $R$ = resistance, ohms.
$W$ = power rating, watts.
$V$ = step voltage, volts.
$I$ = full load current, amps.

The resistor must be connected as in Fig. 3, *i.e.* with the resistor contact towards the higher voltage tapping.

Any value of output voltage within the tapping range can be obtained by connecting X (Fig. 3) to the tapping of the required voltage.

This system is a simplified form of the voltage regulator used for power distribution, these usually being fully automatic instead of hand operated. Fully automatic operation, or automatic high—and low—voltage alarms for hand operation, can be used in the present case, but these systems are unnecessarily complicated and hand operation is adequate for the present application.

## Typical Design

The following is a typical design for a regulator capable of giving an output of 2·08 amps. at a maintained voltage of 240v., from a supply whose voltage varies between 205 and 255v.

The maximum variation in supply voltage is 50v., so that an 11-position switch will give ten 5v. steps as recommended.

The transformer rating is:

$$5 \times 10 \times 2{\cdot}08 = 104 \text{ VA.}$$

The cross-sectional area of the core:

$$\frac{104}{60} = 1{\cdot}73 \text{ sq. ins.}$$

The number of turns per volt is, therefore:

$$\frac{5{\cdot}8}{1{\cdot}73} = 3{\cdot}35.$$

The number of turns between the start of the winding A (Fig. 3) and any tapping is 3·35 times the voltage of the tapping, *e.g.*: 205 volt tapping, 686 turns; 255 volt tapping, 856 turns.

The size of wire between B and C (Fig. 3) is then:

$$\frac{2{\cdot}08}{2{,}000} = 0{\cdot}00104 \text{ sq. ins. cross section} = 20 \text{ S.W.G.}$$

The winding between A and B carries a current

$$= \frac{1{\cdot}1 \times 104}{205} = 0{\cdot}558 \text{ amps.}$$

and the wire size is

$$\frac{0{\cdot}558}{2{,}000} = 0{\cdot}00028 \text{ sq. ins. cross section} = 24 \text{ S.W.G.}$$

Reference to wire tables shows that 170 turns of 20 S.W.G. occupies 0·253 sq. ins. of winding space, and 686 turns of 24 S.W.G. 0·4 sq. ins. Allowing 40% for insulation and tappings, a total winding space of 1·1 sq. ins. is required.

A core should be chosen, having the required cross-sectional area and winding space.

The value of the transition resistor will be:

$$\frac{5}{2{\cdot}08} = 2{\cdot}4 \text{ ohms}$$

and its rating

$$2{\cdot}08^2 \times 2{\cdot}4 = 10{\cdot}4 \text{ watts.}$$

The value of this resistor is not critical, and two 6 volt, 6 watt, car side lamp bulbs in parallel may be used. This will give indication should the switch be left midway between two positions.

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### Bright Idea

Mr. G. P. Marley, G3CPI, has discovered that the following idea allows more accurate calibration of the B2 receiver: The slow motion tuning knob is replaced by a larger knob marked in degrees and a small dab of white paint is made on the black face of the receiver, level with the top of this knob. The amateur bands are then found to be spread over almost 360 degrees of this dial.

### Good Work

More than 10,000 emergency messages were handled by amateur operators during the serious Columbia River floods in the United States last May. 28 Mc/s. mobile links and an elaborate 144 Mc/s. intercommunication system helped to keep the main 3·5 Mc/s. communication nets working at high pressure throughout the danger period.

### Copenhagen Broadcasting Conference

The recent conference in Copenhagen of the 32 European Member-Nations of the International Telecommunication Union agreed upon a redistribution of the long and medium wavelengths used for broadcasting. The new allocations, which supersede the 1933 Lucerne Plan, will give the B.B.C. one long and 13 medium-wave channels. It is unlikely that there will be any substantial difference in programme facilities although most transmitters will have to change wavelengths. The Copenhagen plan is due to come into force in March, 1950.

# AN ALL-BAND AERIAL FOR THE B.R.S.

By G. A. HOOK (B.R.S.1914)*

A SIMPLE aerial system, capable of giving good results on all amateur frequencies, yet easily coupled to a receiver which was situated some distance from an outside window, presented a tricky problem in design. The aerial to be described works satisfactorily on all the H.F. amateur bands at present in use, and it appears to be equally suitable for 21 Mc/s. operation.

In order to obtain good efficiency on 3·5 Mc/s. (the lowest DX band for B.E.R.U. Contest scoring), it was necessary to employ a half-wavelength of wire for this band, *i.e.* 134 ft. The distance between the window and the receiver was too great to allow the use of a long-wire end-fed aerial, so it was decided to run an untuned feeder from the receiver to the window, where an impedance-matching transformer was installed to couple direct to the centre of the 134 ft. aerial, as illustrated in the diagram. On all the bands on which it is in circuit, the matching transformer is at a voltage node, so that all it need contain is a simple parallel-tuned circuit with provision for coupling to the untuned feeder.

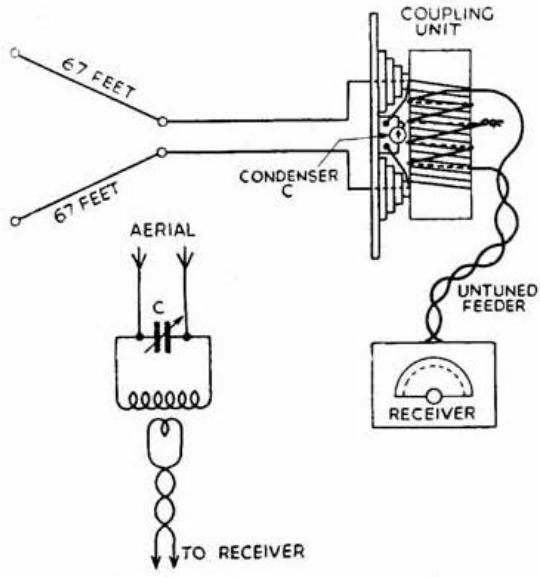



Diagram of the All-Band Aerial and coupling unit feeding into the "Dipole Aerial" terminals of the receiver.

## Coupling Unit

The coupling unit, which is shown diagrammatically above consists of two "beehive" insulators, mounted four inches apart on a board, together with a 50 pF midget variable condenser. A length of twin feeder (plastic-covered lighting flex) is brought from the dipole terminals of the receiver, around the edge of the floor and up to the window, where the coupling unit is installed. The plastic-covered wires are separated for about 20 inches and wrapped around the coil in opposite directions, with the ends joined, so that a 2, 3 or 4-turn coupling can be made.

The following table shows how the aerial and coupling unit are used on the various amateur bands. In the case of 3·5 and 21 Mc/s. operation, the coupling unit is not used, the centre of the aerial being connected directly to the feeders leading to the receiver.

| Mc/s. | Wave-length Fraction | Method of coupling, using coil 2" diam. wound with 14 SWG. wire | Link Turns |
|---|---|---|---|
| 3·5 | Half | Current fed. Couple direct to feeder. | – |
| 7 | Full | 30 turns, spaced to cover 4". | 4 |
| 14 | Two | 15 turns, spaced to cover 3". | 3 |
| 21 | Three | Current fed. Couple direct to feeder. | – |
| 28 | Four | 5 turns, spaced to cover 1¼". | 2 |

## Method of Tuning

When tuning the unit, the appropriate coil is connected, and the untuned feeder coupled to it. The receiver is operated with the A.V.C. *off*, and a signal near the centre of the band is tuned in. Rotation of the condenser in the coupling unit will cause an increase in signal-strength (about two *S*-points) at resonance. Failure to show a marked resonance-point indicates that the size of the coil is incorrect.

Interesting comparisons can be made, in sensitivity and directivity, by disconnecting one "leg" of the aerial feeder and re-tuning the condenser to resonance. In order to economise in garden-space, the two halves of the aerial can be run in different directions, making the aerial work as a "Vee" for the higher frequencies, but at the same time retaining its resonant properties at the lower amateur frequencies.

*"Llanfair," Two Mile Ash, Horsham, Sussex.

## NOMINATIONS FOR COUNCIL 1949

In accordance with the Articles of Association the following Corporate Members have been nominated to serve on the 1949 Council :

OFFICERS.

*President:* Mr. V. M. Desmond, G5VM.
*Executive Vice-President:* Mr. W. A. Scarr, M.A., G2WS.
*Hon. Treasurer:* Mr. A. J. H. Watson, F.S.A.A., G2YD.
*Hon. Secretary:* Mr. J. W. Mathews, G6LL.
*Hon. Editor:* Mr. A. O. Milne, G2MI.

MEMBERS.

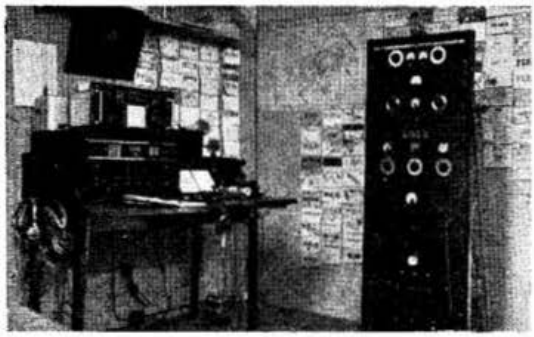
* Mr. W. H. Allen, M.B.E., G2UJ.
Mr. I. D. Auchterlonie, G6OM.
Mr. F. Charman, B.E.M., G6CJ.
Mr. D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E., G5CD.
* Mr. W. N. Craig, G6JJ.
* Mr. D. A. G. Edwards, G3DO.
* Mr. G. Webster, G5GK.

* New Nominations as per Article 43

*Not later than October 31 next, any ten Corporate Members (but not more than ten) may nominate any other duly qualified Member, by delivering their nomination in writing to the Secretary, Inc. Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, together with the written consent of such Member to accept office if elected, but each such nominator shall be debarred from nominating any other Member for this election.*

# The Station Behind the Call

## G3LB *



The Transmitter and Operating Table at G3LB.

TYPICAL of many present-day amateur stations, the equipment in use at G3LB of Ripon, Yorkshire consists of a judicious selection of commercial apparatus, converted ex-Service units, and a home-built transmitter. Although regularly active on the long distance frequencies, G3LB enjoys technical discussions and much time is spent conceiving and constructing new equipment. Considerable ingenuity has been expended upon assembling and building a station which is convenient to operate, flexible in design and capable of providing consistent communication throughout the world.

### The Transmitter

The transmitter rack has been made out of an old bedstead, the 2in. × 2in. × $\frac{3}{16}$in. channel iron, though hard to drill, is ideal material and the cost was nil. On the bottom chassis is a rewound, ex-Navy H.T. transformer, tappings on the secondary allow seven different voltages between 300–1,250 smoothed D.C. to be used. Two U19/23 rectifiers provide 500–1,250 volts at 200 mA. for the P.A. stage, two 5R4GY tubes, each strapped for half-wave, give 350 mA. at 450–750 volts for two 807 modulators and an 807 buffer doubler. A single 5U4 has an output of 300 volts at 225 mA. for the modulator pre-amplifier, the 807 screens and the exciter stages. During phone operation a relay switches the H.T. transformer primary and a second relay is available for switching the primaries of the several heater transformers.

The next chassis contains the smoothing chokes and capacitors for the three H.T. supplies and also the heater transformers. A tapped heater transformer permits practically any type of valve to be tried in the P.A. stage. A regulated bias supply, variable between 50–200 volts, with a front panel voltmeter, is incorporated.

The line-up of the modulator is a little unorthodox, being 6L7—6J5—into a 6F6 which is strapped as a triode. In the cathode of this 6F6 is connected the secondary of a *Ferranti* 2·7/1 push-pull output transformer, connected back-to-front in order to give a step-up ratio into the class AB2 push-pull 807 output valves. A 6X5 rectifier biases the 807's at 30 volts. The modulation transformer is a multi-ratio type and from the secondary is connected an 866 Junior rectifier to provide a biasing voltage which is fed back into the 6L7 input stage and forms a most effective automatic modulation control. The panel meter reads the anode current of the modulator output valves. Three microphones are available, a T17 push-to-talk carbon, a dynamic and a D104 crystal generally used.

The exciter chassis comprises a 6F6 crystal oscillator or V.F.O. tuned to 3·5 Mc/s., a 6V6 doubler and an 807 buffer or doubler, all capacity coupled. The top chassis just holds the P.A. with two TZ40's in push-pull, mounted horizontally so as to keep the anode and grid leads very short. Several plugs and sockets at the rear of the chassis allow modulation to be injected in either the cathodes, grid or anode circuits and enable any value of grid or cathode resistance to be plugged in as required. For the TZ40's a combination of cathode and grid leak bias is used, the standing current being 25 mA. Link coupling, *via* a short co-axial lead is employed between the exciter and the P.A. grid coil.

The narrow panel at the top of the rack holds an aerial coupling unit with two thermal-couple R.F. meters.

### Other Equipment

On the operating table may be seen an R.C.A. AR88D receiver. Standing on this is a field strength meter and phone monitor, consisting of a type 30 valve, diode connected, with a 500 micro-ammeter as indicator. Also on the AR88D is a TU5B unit which has been modified and made into a cathode follower V.F.O. This unit is very stable and keys perfectly. A power supply is built-in. The 3–4 Mc/s. R.F. output from this unit is fed *via* a co-axial line into the crystal sockets of the transmitter. A BC221 frequency meter can also be seen at the side of the receiver.

The aerials include a fixed W8JK 14 Mc/s. beam running North/South and made entirely of twin ribbon wire. On 7 Mc/s. a 69ft. end-on aerial 40ft. high at the house end and sloping to about 10ft. at the far end is employed. A ceramic rotary switch changes the aerial in use from transmit to receive.

* *A. R. Yates, 7 Skellbank, Ripon, Yorks.*

### Service Qualifications for Amateur Licences.

Technical and Morse qualifications obtained by service in certain trades or specialist duties in the Armed Forces during, or since the war, are at present accepted by the G.P.O. as giving exemption from parts of the Amateur Wireless Licence examination. The G.P.O. state that, as from January 1, 1949, these qualifications will be regarded as valid only if applicants have been engaged in the Services in one of the specified trades within two years of the date of their application for a licence.

EXPERIMENTAL STANDARD-FREQUENCY TRANSMISSIONS

# GB1RS

From October 18 the Headquarters' Station, GB1RS, will transmit daily for two minutes at each hour between 1800-0800 G.M.T. on a frequency of

**3500·25 kc/s**

when the following message will be sent automatically in Morse Code at a speed of 12 words per minute:

**CQ de GB1RS (repeated) QRG 3500·25 kc/s**

**$\overline{\text{VA}}$ GB1RS (followed by a long dash)**

# OFFICIAL REGIONAL MEETINGS

## RECORD ATTENDANCES AT MANCHESTER AND NEWCASTLE

THE Region 1 meeting held at Belle Vue, Manchester on September 19 was marked by the presence of no less than six representatives from Headquarters in the persons of the President, Mr. V. M. Desmond (G5VM), the Executive Vice-President, Mr. W. A. Scarr, M.A. (G2WS), Council Members, Messrs. I. D. Auchterlonie (G6OM), and C. H. L. Edwards, A.M.I.E.E. (G8TL), the General Secretary, Mr. John Clarricoats (G6CL), and the Assistant Secretary, Miss May Gadsden.

The Guest of Honour was the Deputy Lord Mayor of Manchester, Alderman T. H. Adams, J.P.

During lunch Alderman Adams gave a warm welcome to visitors from other cities and towns—his speech containing many witticisms aimed at those "unfortunate" enough to live outside Manchester!

### Business Meeting

The chair during the business meeting was taken by the President after preliminary introductions had been affected by Mr. G. Webster (G5GK), Region No. 1 Representative.

No O.R.M. would be complete without the General Secretary's statement on matters of current interest in the world of Amateur Radio and on this occasion a variety of topics was covered in the way that only "Clarry" can. Mr. Scarr spoke of the work of the Scientific Observations Groups and appealed for more members to come forward and offer their services as volunteer observers. The applause which followed an all-too-brief speech by Mr. Auchterlonie clearly demonstrated the popularity of "our own" member. It was a matter for regret that time did not permit Mr. Edwards to include a few words of his own. His presence, however, was sufficient evidence of his desire to be of help if required and therefore greatly appreciated. For the first time members living in the north-west had the pleasure of welcoming Miss Gadsden, who spoke ably of the difficulties encountered in the daily office routine at New Ruskin House and gave some firm but friendly advice to those who write in to Headquarters. It is hoped that she will visit future Region 1 meetings as a matter of course. A discussion followed after which Mr. Webster gave generous thanks to the members of the organising committee who had so ably assisted him in making the day a complete success. The President expressed his thanks and those of his colleagues to G5GK and his committee for their efforts.

### The After Proceedings

The final event took place immediately after the tea interval when no less than eighteen prizes, including a *Taylor* Oscilloscope, an *Eddystone* 640 receiver, and a *Radiovision* Hambander were distributed. Alderman Adams made the presentations to the lucky winners.

The attendance of 300 was a record for any Region and thanks are extended to all who attended for making possible this really excellent result. It was particularly gratifying to note the presence of HB9HF of Zurich together with a member of the French Society (R.E.F.). Special mention must also be made of Major Ken Ellis, G5KW (ex MD5KW, etc.), whose spirited proposal of a toast to Region 1 "brought the house down" in a manner which must have left the Major in no doubt of the special welcome intended for him.

Finally a word of praise and thanks to the Belle Vue authorities for the excellent catering and accommodation facilities provided and to those good friends of the radio trade who brought along their products designed expressly and exclusively for the furtherance of Amateur Radio. G3BUI

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THE Region 2 official meeting held at the Crown Hotel, Newcastle-on-Tyne, on September 5, attracted the largest R.S.G.B. gathering ever recorded in that part of the country. At the commencement of the meeting the Regional Representative, Mr. C. A. Sharp (G6KU) acknowledged the excellent work of the C.R.'s for Durham and Northumberland, Messrs. L. Spencer (G4LX) and T. Orr (G3IV).

Before beginning his speech the General Secretary Mr. John Clarricoats (G6CL), asked those present to stand for a moment in silent tribute to the memory of Mr. Kenneth Warner (W1EH) Managing Secretary A.R.R.L. the news of whose passing had been received a few days previously.

Having commented favourably on the number attending the meeting "Clarry," in a discourse which lasted well over an hour, covered a tremendous amount of ground and furthermore answered a host of questions in his customary efficient and urbane manner. Mr. C. H. L. Edwards (G8TL) also spoke on matters of topical and general interest.

Tea was followed by a "swindle" in which, as usual, the most junior B.R.S. won the largest high-voltage transformer! After a showing of the 1947 N.F.D. and D/F field day films informal discussions continued among those who did not have to make too early a departure. From the many favourable comments heard we have no hesitation in reporting a highly successful meeting. "Here's to the Next Time." G4GJ.

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### Headquarters Station—GBIRS

As from Monday, October 18, the experimental 3500·25 kc/s. standard marker signals will be radiated for approximately 2 minutes beginning at each hour from 18.00 G.M.T. to 08.00 G.M.T. It is felt that the new schedule will give further opportunities for medium and long distance reception of the service during the winter months. In view of the comparatively few listeners during normal business hours and the restricted range of 3·5 Mc/s. signals at such times, the number of day-time transmissions is being reduced.

### Radio Sounding Balloons

It is understood that, as the result of representations made by the Society, the authorities concerned have now circularised all their meteorological stations emphasising the necessity for avoiding interference with amateur stations working in the 28 Mc/s. band, through the out-of-band operation of radio-sounding balloon transmitters.

### The Amateur Radio Exhibition

A copy of the Official Exhibition Catalogue is included with each copy of this issue of the BULLETIN posted to members of the Society. Non-members can purchase a copy from Headquarters, price 1/3 post free, or may obtain a copy at the door during the period of the Exhibition. Admission to the Exhibition will be by catalogue.

The General Secretary will be glad to hear from members in the London area who are willing to undertake duty on the Society's stand during the day-time.

# RADIO AMATEURS' EXAMINATION

As announced in the September issue of the BULLETIN, more than 75 per cent. of the 700 home and overseas candidates who sat for the 1948 Radio Amateurs' Examination were successful compared with only 37 per cent. in 1947. In a report issued by the City and Guilds of London Institute, this remarkable improvement is attributed to more adequate preparation resulting in a higher standard of work, both technically and in the manner in which the questions were answered. This year with very few exceptions, candidates attempted all questions.

For the benefit of prospective candidates a copy of the 1948 question paper is reproduced below. Duration of the examination was three hours and the maximum possible marks obtainable is affixed to each question.

## The Examination Paper

1. How is a low-power transmitter likely to interfere with broadcast reception? What steps would you take to prevent such interference? (15 *marks.*)

2. What steps should be taken by the holder of an amateur transmitting licence to ensure full compliance with the requirement that a full record should be kept of all transmissions? (15 *marks.*)

3. Give a brief description of a suitable receiver for the 58·5 to 60 Mc/s. frequency band, and explain how it works. (15 *marks.*)

4. How is the input power to the last stage of a transmitter measured? What is understood by the "efficiency of operation" of this stage and how is this connected with the permissible anode dissipation? (15 *marks.*)

5. Describe briefly how the ionosphere influences the propagation of radio waves, and how propagation differs between the 1·7 to 2·0 Mc/s. band and the 58·5 to 60 Mc/s. band. (10 *marks.*)

6. What advantage is gained from using a piezo-electric crystal oscillator in a radio transmitter? Give a diagram of a crystal controlled stage for a short-wave transmitter. (10 *marks.*)

7. Describe a transmitting aerial suitable for one of the amateur bands, indicating the main features of the design and any directional properties. Illustrate your answer with a diagram. (10 *marks.*)

8. What is the effect of connecting two capacitors (*a*) in series and (*b*) in parallel?

What is the total effective capacitance when four capacitors, each of 100 $\mu\mu$F are connected in a series-parallel arrangement consisting of two parallel paths, each of which contains two capacitors in series? (10 *marks.*)

## Examiners Report

The official report on the manner in which the individual questions were answered makes cheerful reading and should provide a valuable guide to those members engaged in preparing themselves or others for the 1949 examination.

*Question* 1. (transmitter interference) Fairly well done by most candidates.

*Question* 2. (log requirements) Very well done by practically all candidates.

*Question* 3. (60 Mc/s. receiver) A fair number of the candidates illustrated their answers with excellent diagrams, but the majority handicapped themselves to some extent by using block diagrams, or by describing the converter circuit without following it up with the succeeding stages.

*Question* 4. (input power) The first two parts of the question were very well answered by practically all candidates, but many found the third part of the question in connection with permissible anode dissipation, difficult to answer.

*Question* 5. (wave propagation) Fairly well done by the majority of the candidates. A fair number failed to describe how propagation differs between the 1·7 Mc/s. and 60 Mc/s. band.

*Question* 6. (crystal oscillator)
*Question* 7. (transmitting aerial)
*Question* 8. (calculation)
} Very well done by practically all candidates.

### The Radio Link

To overcome the difficulties of a scattered membership, the West Cornwall Radio Club have latterly commenced publication of a monthly magazine under the title *The Ratio Link*. The first 12-page issue contains editorial comment, several technical articles, and a description of the equipment at G6BC—not to mention the sad story of Percy Doodlepit who *would* work Mars on 420 Mc/s. But, perhaps, it is in the lively sectional notes from Penzance, Falmouth and Redruth that the journal admirably fulfils its primary object of disseminating all the local news and gossip. To maintain its present high standard, the Secretary, Mr. R. V. A. Allbright, G2JL, Greenacre, The Lidden, Penzance, will require the active support of all Cornish members.

### OUR FRONT COVER

THE photograph on our front cover this month depicts adjustment of the I.F. stage of a Receiver being carried out with the aid of an "Avo" Oscillator, with a Model 7 AvoMeter being used as output meter.

The picture, which was awarded first prize in the "Avo" photographic competition for R.S.G.B. members, was submitted by Capt. A. Juniper of the 2nd Div. Sig. Regt., B.A.O.R., and the prize money was paid, at Capt. Juniper's request, to the Royal Signals Benevolent Fund.

### Suppression of Private Cars

The staff of the B.B.C. will not in future be authorised to use their private cars on Corporation business unless suppressors have been fitted. They will have to satisfy the allowances officer that this has been done in order to qualify for car allowances. The cost of fitting the suppressor will be borne by the Corporation. All Corporation vehicles are already suppressed.

Satisfactory interference suppression is obtained by fitting a suitable resistor of about 15,000 ohms in each sparking plug circuit or one of about 5,000 ohms in the connection between the sparking coil and the distributor head.

### Broadcast Receiving Licences

The number of broadcast receiving licences in force in Great Britain and Northern Ireland at the end of August, 1948, was approximately 11,324,000. This number includes 61,700 television licences, an increase of 3,450 over the previous month.

Prosecutions during August for operating wireless receiving apparatus without a licence numbered 509.

Despite previous warnings, some motorists continue to overlook the fact that it is necessary for them to take out a separate broadcast receiving licence for a wireless set fitted in a motor car.

### Around the Trade

Recent issues of the "M.O.S. Newsletter" published by the *Mail Order Supply Co.*, 3 Robert Street, London, N.W.1, price 6d., represent a novel departure from the normal trade catalogue. The 12 large and attractively-produced pages not only provide full information on the ex-Government equipment offered by this firm but, in addition, contain an interesting selection of news items, comment and technical miscellanea.

### VK5JS

It is noticed that QSL's from Mr. J. M. Strafford, VK5JS, suggest that he holds the Empire DX Certificate. In fact Mr. Strafford does *not* hold this certificate. He submitted only 50 cards in support of his claim instead of the required 100.

# THE MONTH ON THE AIR

## By A. O. MILNE (G2MI)*

### Sharp Practice

WITH the return of good conditions on 28 Mc/s. and the appearance of a number of rare countries on the band, we are once again being treated to an exhibition of tactics which are just plain disgusting. Certain amateurs, whose one object in life is to demonstrate what big DX men they are, continue to adopt the most questionable tactics to work new countries.

The system seems to be that you call the rare DX station exactly on his own frequency. If he goes back to someone at a distance, then you do your best to break up the contact by continuously calling him. If the station he is working is within ground wave then the method is to keep breaking in with remarks like "Hold him for me," "Me next please," etc. If still no luck then you get cross and hurl abuse at the man who raised him for being unsportsmanlike.

If "rare DX" asks his correspondent to move, then all one has to do is to go on and give him a long call. After all, he is now looking for someone repeating his callsign so why should it not be you? If none of these subterfuges works, then all you have to do is call CQ at the top of your voice with the mod. full on and so splatter up that part of the band that there is a good chance the QSO will break down and you will have another chance later of being the first G to make the contact.

A certain much sought after "rare country" announced the other day that he was making a note of the call-signs of those stations trying to break-in and that he would not, either then or at any future time, answer their calls. Good for you O.M. Other DX stations please copy! Where will G2— and G6— and a few more of them be then poor things?

### Notes and News

A very welcome increase in the number of letters received this month. Please keep it up. G4CP says VP8AM is now in Antarctica which of course counts as a separate country. He tells us that 11PL will not be going to San Marino this summer but is trying to get permission to operate from Vatican City. If there is proved activity in HV there will be no difficulty in its recognition as a separate country. A.R.R.L. will however not so recognise it until someone receives a genuine QSL. W1FH has now worked 214 countries and has 204 confirmed. W6VFR has 207. Other items from the 4CP bag include PJ0X, who QSL's, VP3ACS, 14035, T9c. PZ1OY Box 547 Paramaribo. FM8AD, 14040 T8. VR2BD, 14052, T9. W8OZG/C6, Box 501, Tsing Tao and VU4AC, 14040 saying he is in the Laccadive Islands.

QSL managers are wanted for VP3, ZD1, and ZD2, any offers? Please write to G2MI. An offer is also awaited from someone to operate the QSL Bureau for the Leeward and Windward Is.

G2DP has FQ8SN's card and had also worked HR1MB. What a wonderful day for ZL's on 28 Mc/s. was September 19th. The whole band was full of them at S9 plus.

MD5AK is now VQ4CUR, QSL via R.S.G.B. He is looking for G's on 28352, 'phone, and 28016, C.W. Is also on 14 Mc/s. VS9AL is active and QSL's promptly. His address is Sq./Ldr. E. A. Luckhurst, R.A.F. H.Q., British Forces in Aden. BRS16304 has received a card from KX6AF, on Kwajalein Atoll in 16 days. He says VE8PM is on Southampton Is. BRS15822, ex. D2IP draws attention to 4UN who claims to be a United Nations station in Rhodes. We have no information but note that this station is now signing SV4UN.

G4FN has been going places with a B2 running at 20 watts to a 66ft. end fed aerial; W6, VK and ZS contacts all show what can still be done with low power.

A1006 reports a queer effect at 1900 B.S.T. on September 14th when the 14 Mc/s. band was full of DX. Suddenly two Northern Ireland stations broke through at S9+, faded down to S7 and remained at this level until they both closed down. No other signal from a comparable distance was audible at the time.

G3BTA states that VR5PL is crystal controlled on 14052, 14056 and 14160 and is looking for G contacts. He QSL's.

G2YV recently worked J4J1 at 1855 G.M.T. on 14355. He said he was using 2½ kW. to an 8 element rotary. QTH Tokyo. As he had a strong Italian accent we suggest he has a warped sense of humour. G2YV is waiting for the card! G3BDS worked HC7KD for the latter's first G on September 9th and got his QSL in eight days. Nice to know of a HC who QSL's at all! VS1AQ is now G3DPR and has worked M1B. GC8NO says why XYL? W1FE is shorter!

G3HK tells us that W2RDK has just completed his DXCC solely on 7 Mc/s. 111 worked, 105 confirmed. Incidentally he is a member of R.S.G.B. G3ATU thinks FI8ZZ is O.K. and also says MD7QRP is genuine. DA1LY is a funny one with a good operator regularly to be heard on 14 Mc/s. On 28 Mc/s. FF8FC and MD4JG are his two plums. He has also heard VK9GW but has not worked him yet. MP4BAB working on 14084 at 577 gives his QTH as R.A.F. Station at Sharjah in Trucial Oman. Is this VS9GT?

BRS15822 gives QTH for ZS4H in Basutoland as Box 41 Kimberley. Has heard W6VDB/FI flying at 8,000 ft. between Bordeaux and the Azores. Says W0IEO Nebraska and W0FCA in North Dakota are regularly heard on 28 Mc/s.

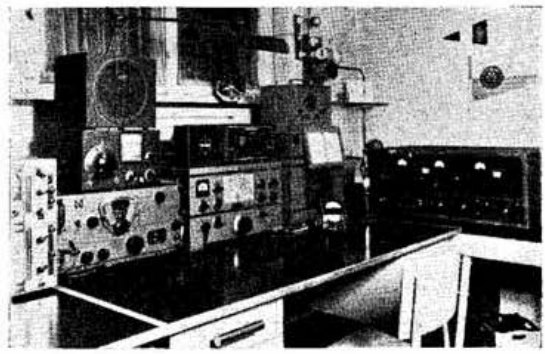
VS6BD a native of Middlesbrough would like some QSO's with that city. What offers? Comment via G4GJ, who has also worked CT3AA, EA8AO, EL3A, HK3FF, KH6LG, HL1BA, KP6AA, KZ5CE, PJ0X, PZ1NB, VP4TAN and ZP3AW. Now beat that! He thinks J9ADA is a phoney or else will not give his QTH for security reasons of some sort.

Following up a series of contacts with VP8AM, G6KU has visited the former's parents in Brandesburton in Yorkshire. They were particularly glad to have an "All's well" as VP8AM can neither send nor receive mail until next February. G4GJ recently worked VE7ADU/8 at Kittigazuit N.W.T. 40 miles east of Alavik.

BRS17097 of Stowmarket agrees with our remarks on protracted cross-town contacts on the DX bands. He says ZD1BD and ZD2RGY put in fine signals around 2200 B.S.T. on 14 Mc/s.

Apparently if you want YS contacts you must rise at 4 a.m. YS1AC on 14300 kc/s. runs an S8 on 'phone around that time.

GC3GS commenting on our remarks last month says he has had several reports of his signal being S8–9 in Scotland when he could not hear a Scottish station at all.



A view of the equipment now in use at ON4UF, Brussels. Operating since 1926, Mr. L. Richard, President of the French-speaking Section of the U.B.A., originally used the call-sign 8–G9, which changed to EB–B5, and later ON4UF. The present transmitter consists of a 6N7 V.F.O. and 6AG7 class A. buffer—both stages being keyed for break-in operation—followed by four 6L6 frequency doublers driving a *Taylor* TB35 power amplifier. Receivers include a *National* NC2–400 with a *Millen* R9 pre-amplifier and *Panadaptor*, a BC348 and *National* I–10. A feature of this station is elaborate test and measuring equipment to check the quality of the signals being radiated.

### A Job well done

On June 19th the town of Castries in St. Lucia, B.W.I., caught fire and by next morning some 80 per cent. of the place was in ashes. On the 20th the news reached the neighbouring Island of Grenada and a relief schooner left with clothes and food on the 21st. VP2GE's father, the Mayor of St. Georges, Grenada, obtained permission for his son to accompany the relief party and he arrived at Castries on the following day. Using the 7 Mc/s. band with a transmitter powered from a petrol engine, his station was on the air by 6 p.m. and contact was maintained with amateurs in St. Vincent, Barbados, Antigua, Tobago and Trinidad. Messages were handled on behalf of the Government, police and private persons.

When the schooner returned to Grenada, the station was set up in the local telephone exchange which had escaped the fire. Two stations in Grenada, VP2GB and VP2GG carried the bulk of the traffic. Officials, Press and Public alike were loud in their praise of the way in which amateurs had stepped into the breach and eased the termendous burden which had been suddenly placed on the harassed local communication system.

Well done chaps. We are proud of you. This story has been kindly passed to us by GM2UU. Thanks O.M.

### Silent Key

It is our sad duty to record the death on September 17 last of Richard Davies, G3DIU, at the age of 24 years. His interest in Amateur Radio was a great help to him during his long illness, and when he was well enough he used to operate from his bedside using the call sign G3DIU/A. We extend our deepest sympathy to his mother and sister. G3DJD.

* *29 Kechill Gardens, Hayes, Bromley, Kent.*

# AROUND THE VHF's

## By W. H. ALLEN, M.B.E. (G2UJ)*

### The Five Metre Field Day

TO those taking part in this event on Sunday, September 26, the fates were indeed kind. A real day out of summer to make portable operation, even in the high places, a pleasure, and for good measure superb propagational conditions which lasted throughout the event. These notes are being written immediately after the finish of the contest, and consist almost entirely, therefore, of the writer's own observations. G2UJ is situated in a very poor position indeed in a radio sense, but nevertheless had a two-way S9 contact with G3MA/P at Mayhill, Hereford, who was laying down a stupendous signal during the morning, and with G3HW/P, 8 miles south of Exeter; an S7 signal for most of the afternoon. Other G-DX heard included 3CQR/P near Bovey Tracey, Devon (S4), and 3MY/P (Derbyshire), S5, while several stations in the South of England worked GW4OS/P situated in Flint. It is good to see that 5 metres is by no means dead, and it is to be hoped that as many stations as possible will continue to operate on the band as well as on our new higher frequency allocations.

### First Five Metre Contact between G and GC

Congratulations are offered to GC8OK (Guernsey) and G3AVF (Torquay) on the first recorded 5 metre contact between the Channel Islands and Great Britain. This took place on August 29, and signals were respectively 579 and 559. On the following day GC8OK worked G3HW/P with a report of 599 both ways, the GC's power being 17 watts to a 3-element beam only 18 ft. high. The receiver was a *Hallicrafters* S27. We understand that GC5OU and G3TN (Portland) also heard one another, but contact was not established.

### Two Metre Results

The big news this month is undoubtedly the opening of the 145 to 146 Mc/s. band where, despite the low power permitted at the present time, results have exceeded most people's expectations. At the time of going to press it is not known definitely who holds the G-DX record, but the contact between G5BY (Thurlestone, Devon) and 6OS (Hull), just under 250 miles, is a pretty good candidate, and both operators are to be congratulated on this very fine performance. In addition 5BY has worked 2IQ (Sheffield) and 3BY (Ashton-under-Lyne).

It is, of course, early days to generalise, but so far DX on 2 appears to be more easily achieved than on 5 metres, although at a given location the results on the two bands are not necessarily comparable.

### Station Reports—Two Metres

G2OI (Manchester) is using an SCR 522 with 24 watts to an 829B final and a 4-element e.s.beam 32ft. high, but situated only 57 ft. a.s.l. His receiver has 3 R.F. stages (2 × EF54 and a 9003), followed by a 9003 mixer and a similar R.F.O. The I.F. amplifier works on 12 Mc/s. 2OI is active every evening after 2130 B.S.T. and would welcome skeds. He can change from 5 to 2 metres or *vice versa* in about 30 seconds, so here is an excellent chance for anyone within range to carry out some interesting comparative tests. His best DX so far was on September 16 when he worked G5BY S5 with some fading. 2OI quotes instances of carriers which he has hung on to for varying periods, and emanating from a southerly direction, but with no call-sign given they have been impossible to identify. Several other operators have written in the same strain, and complaining of the number of seemingly unmodulated signals heard. *Please* sign off 'phone transmissions with your call! G6DH (Clacton) made his first contact on the band with PA0PX. This was on September 14 at 2233 GMT. His signals were 579 in Holland, while those of the PA varied from S9 to S6. Two days later he heard G5BY (240 miles) at 559, and on September 19 had a cross-band QSO (5 and 2 metres) with ON4FG (144·1 Mc/s.) over a distance of 155 miles. [Late News.—On September 25 G6DH contacted ON4FG for the first G-OX QSO on 2 metres. He later worked G5BY (240 miles) and G2BMZ.—Ed.] 6DH is using a Type 37 oscillator for his V.F.O., close to 145 Mc/s., and his times of operation—GMT—are as follows ("L" stands for "listening" and "C" for "calling"):

*Beam S.E.* 0645L—0650C 145 Mc/s.
0700 on 3,580 kc/s. for exchange of reports.
1840L—1845/50C 145 Mc/s.
2045L—2050C 145 Mc/s.
*Beam S.W.* 1900L—1905C 145 Mc/s. and from 2130 onwards.

G5MQ (Liverpool) has worked G5BY, 6LK, 6VX and 8DM in addition to the contact with 2AJ/P reported last month. His transmitter is an SCR 522 and the receiver a 4-stage (acorn) converter into an AR88 on 31 Mc/s. The aerial is a 4-element beam.

G5US (Frimley, Sy.) has worked a number of stations including G2BMZ, 2XC and 5BY, his 8-element Yagi beam, 38 ft. high, no doubt having an important bearing on these results. The receiver at this station is worthy of note, and consists of a pair of 6AK5's in push-pull in the R.F. stage, a 6J6 push-pull mixer, and another 6J6 R.F.O. The transmitter is an 815 P.A. driven through multiplying stages from an 8 Mc/s. crystal.

G2AJ (Hendon) is putting up a very consistent performance on the band, and mentions that he overheard a contact between G6LK (Cranleigh) and 5TZ (Newport, I.O.W.), when the latter's beam was resting on top of a pair of steps in the garden, only 5 ft. above ground!

G2FMF (Hillingdon, Middx.) has been on the band since September 1 with 25 watts to a TT15 P.A. and a modified R.F. Unit Type 27 employing EF54's in all stages for a converter. At present his aerial is an indoor dipole, but even so he has heard a number of stations including G5BY.

G6CB (Wimbledon) is at present a real QRP station with two VR135's in push-pull, quintupling from 29 Mc/s. and radiating not more than about ·25 watt. Nevertheless he has had no difficulty in working the locals, and his experiences are interesting in proving that even if you haven't got the P.A. built yet, nor the multi-element beam *quite* lined up, you can still get some fun out of the new band.

G2UJ (Tunbridge Wells) has had a rather inauspicious start, and from his aforementioned poor location finds that it is nothing like so easy to get out on 2 as on 5 metres. Results even with South London stations have been non-existent to poor, but a good contact at S7 with G5RP at Abingdon—75 miles—gives reason to believe that all is not yet lost! Reports will be welcomed from any distance.

G3AMB (Slough) is on 145·116, 145·35 and 145·8 Mc/s. and will QSL all reports on his signals from distances over 30 to 40 miles.

From G6DH we learn that ON4FG and PA0PX made the first contact between their respective countries on September 10, and that F8BY and F8OL are active in the Paris area. Most European stations operate between 144 and 145 Mc/s.

### T.V.I. on Two Metres

For those who may have qualms regarding T.V.I. we have some cheering news. G3BPM is a T.V. service engineer, and is now putting all incoming T.V. receivers through a QRM test. He has a 2 metre aerial located within a few feet of the T.V. aerial, and with 10 watts of 145 Mc/s. R.F. at this range has so far failed to produce interference *of any sort* with either vision or sound on a representative number of receivers. If you don't believe it, or want advice, we suggest that you get in touch with him at 119 Lakenheath, Southgate, N.14.

### 420 Mc/s.

With the release of this band on October 1 we anticipate being able to report first contacts in this article next month. G3AMB (Slough) is ready for this band, and will be employing a modified APS13 with an input of 10 watts and a dipole and parabolic reflector.

### DX on the Commercial V.H.F.'s

A correspondent at Feltham, Middlesex, reports a remarkable case of freak reception which occurred last July on the commercial aircraft frequency of 117·1 Mc/s. The radio operator of an aircraft flying at 1,500 ft. and about to land at Malta, called up the Tower, and was answered QSA 5 by Wadi-Halfa at a distance of over 1,000 miles. We should be interested to hear from anyone who can quote examples of even greater ranges achieved on these frequencies either during or since the war.

Closing date for notes for inclusion in the November issue will be Saturday, October 23.

### French Five Metre Contests

We understand from F8NW (Hardelot) that R.E.F. have arranged contests for the weekends of October 23-24, November 20-21 and December 18-19. Hours of operation will be from 1200 to 2400 G.M.T. on Saturdays and from 0800 to 2400 G.M.T. on Sundays. British amateurs are cordially invited to participate.




*32 Earls Road, Tunbridge Wells, Kent

## "Top Band" Contest

THE "Top Band" Contest will be held during the week-end of November 27–28, 1948.

Intending entrants should note that the Rules and Scoring System have been modified. The Contests Committee will appreciate the comments of entrants on these changes.

### Rules.

1. The contest is open to all fully paid-up members of the Society resident within the British Isles (Prefix Zones G, GC, GD, GI, GM, GW) and the British Occupied Zone of Germany (D2).

2. The contest will take place between 10 p.m. G.M.T. on Saturday, November 27, and 9 a.m. on Sunday, November 28.

3. Entries will only be accepted if submitted on foolscap or quarto paper and set out in the form below :—

**Top Band Contest**

November 27–28, 1948.

Name ..... Call Sign .....

Address .....

Transmitter .....

Aerial System .....

Receiver .....

| Contact No. | Time | Call Sign of station worked | Report Sent | Reg. | Recd. | Reg. | Points Claimed 1 | 3 | 5 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | G2—— | 599 | 7 | 599 | 6 | | 3 | |
| 2 | | G3—— | 599 | 7 | 599 | 7 | 1 | | |
| | | | | | Sub-Totals | | | | |
| | | | | | TOTAL | | | | |

*Declaration : I declare that my station was operated strictly in accordance with the rules and spirit of the Contest and I agree that the ruling of the President of the R.S.G.B. shall be final in all cases of dispute.*

*Signed* .....

4. Details at the top of the entry form must be completely filled in and the declaration signed, otherwise the entry will be disqualified.

5. Entries must be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1. No entry will be accepted bearing a postmark later than Monday, December 6, 1948.

6. Contest operation during local hours of restriction in the use of electricity for wireless which have been publicly announced is prohibited.

7. Proof of contact may be required.

8. Contacts with or calls from ships or unlicensed stations will not be permitted to count for points.

9. The contest is confined to two-way telegraphy contacts only.

10. Only the entrant will be permitted to operate his apparatus during the contest.

11. An exchange of RST report and Region number will be required before points for a contact can be claimed.

12. Only one contact with a specific station during the contest will be permitted to count for points.

13. The system of point scoring will be as follows :—

(*a*) For entrants in the British Isles (G, GC, GD, GI, GM, GW)—

One point will be scored for contact with a station in the entrant's own R.S.G.B. Region.

Three points will be scored for contact with a station in any other R.S.G.B. Region.

Five points will be scored for contact with a station outside the British Isles (*e.g.* D2).

(*b*) For entrants in the British Zone of Germany (D2) —

One point will be scored for contact with a station in the British Zone of Germany (D2).

Five points will be scored for contact with a station outside the British Zone of Germany (D2).

14. The power input to the final stage of the transmitter or to any preceding stage must not exceed 10 watts.

15. Any competitor consistently receiving tone reports lower than T8 will automatically be disqualified.

16. Stations can also be disqualified for unethical operating procedure reported by the monitoring stations.

17. The Somerset Trophy and a replica or miniature will be awarded to the station with the highest total score. Certificates of merit will be awarded to the stations placed second and third.

18. The Contests Committee reserves the right to alter or amend these Rules at any time prior to the commencement of the contest.

19. The President's decision will be final in all cases of dispute.

### Suggestions.

Logs of non-contestants should be marked "Check Log."

Before attempting another contact, be sure that the last one was completed.

Be sure that your report records are correct.

Do not work stations twice.

Be sure you post your log in time.

## Five Metre Contest Results

### Second Section

| Position | Call Sign | Points | Location |
|---|---|---|---|
| 1 | G3BLP | 603 | Selsdon, Surrey. |
| 2 | G5MA/P | 580 | Linch Down, Sussex. |
| 3 | G2ADZ | 570 | Oswestry, Salop. |
| 4 | G6XM | 532 | Farnborough, Hants. |
| 5 | G2MR | 489 | Surbiton, Surrey. |
| 6 | G3HW/A | 474 | Teignmouth, Devon. |
| 7 | G3APY | 468 | Kirkby, Notts. |
| 8 | G2XC | 461 | Portsmouth, Hants. |
| 9 | G6OS | 428 | Hull, Yorks. |
| 10 | G2OI | 419 | Eccles, Lancs. |
| 11 | G4NT/P | 412 | High Wycombe, Bucks. |
| 12 | G3WW | 287 | Wimblington, Cambs. |
| 12 | G6NK | 287 | Weybridge, Surrey. |
| 14 | G2KI | 283 | Walton-on-Thames, Surrey. |
| 15 | G4MR | 277 | Slough, Bucks. |
| 16 | G2KG | 276 | Chelmsford, Essex. |
| 17 | G5LQ | 269 | Chiswick, Middlesex. |
| 17 | G5MR | 269 | Felpham, Sussex. |
| 19 | G3GGQ | 267 | Luton, Beds. |
| 20 | G6HD | 265 | Beckenham, Kent. |
| 21 | G5RP | 251 | Abingdon, Berks. |
| 22 | G3CWW | 237 | Hendon, Middlesex. |
| 23 | G2DM | 216 | Bradford, Yorks. |
| 24 | G5IM | 192 | Southall, Middlesex. |
| 25 | G4RO | 189 | Welwyn Garden City, Herts. |
| 26 | G2LC | 187 | Ruislip, Middlesex. |
| 27 | G2HDJ | 178 | Thrapston, Northants. |
| 28 | G2AOL | 176 | Otford, Kent. |
| 29 | G2UJ | 127 | Tunbridge Wells, Kent. |
| 30 | G8LY | 50 | Lee-on-Solent, Hants. |
| 31 | G2DHV | 13 | Lewisham, London. |

*Disqualifications.* (Unchecked. Claimed scores given.) No declarations, G2AJ/P 718, G5OJ 138. Locations (town *and county* not given), G5BM 401, G5UM 156, G8TS 165.

*Check Logs.* The following are thanked for sending check logs : G2HDU, G3BVU, G5DF, G5PV, G6KB.

### Combined Scores—First and Second Sections

| Position | Call Sign | Points | Position | Call Sign | Points |
|---|---|---|---|---|---|
| 1 | G3BLP | 1,088 | 10 | G5RP | 620 |
| 2 | G6XM | 1,061 | 11 | G4MR | 488 |
| 3 | G5MA | 1,011 | 12 | G5MR | 469 |
| 4 | G2XC | 996 | 13 | G3CWW | 401 |
| 5 | G2ADZ | 984 | 14 | G4RO | 391 |
| 6 | G2MR | 952 | 15 | G6NK | 388 |
| 7 | G3APY | 911 | 16 | G2LC | 300 |
| 8 | G6OS | 740 | 17 | G2UJ | 190 |
| 9 | G2OI | 727 | | | |

## All European DX Contest Results

Results of the V.E.R.O.N. 1947 DX Contest published in the September issue of *Electron* show that more than 200 entries were received from nearly 40 countries. The C.W. contest was particularly well supported and the judges commented favourably upon the care with which the logs were compiled. The highest individual score was recorded by OK1FF who had 140 contacts with 74 countries on 4 bands to achieve a total of 30,710 points. Other high scorers were HB9AW (25,704), PA0RE (23,485), PA0UN (17,985), and F8EO (17,658).

Leading British entries were :

| | | | | | | |
|---|---|---|---|---|---|---|
| GW3ZV | 126 | contacts | 53 | countries | 14,310 | points. |
| G8KP | 87 | ,, | 48 | ,, | 12,528 | ,, |
| G8KG | 90 | ,, | 46 | ,, | 12,420 | ,, |
| G5CW | 87 | ,, | 43 | ,, | 10,191 | ,, |
| G8IP | 73 | ,, | 36 | ,, | 7,884 | ,, |

Certificates of merit will be awarded by V.E.R.O.N. to the leading station in each country including G8KP, GD2DF, G3BKG, GM8CH and GW3ZV. Comparatively few entries were received in the telephony section, G8JQ, GM2UV and GW3QN, being the only British participants. Highest score was 5,181 points amassed by OK3HD from 53 contacts with 33 countries.

Due to a heavy calendar of activities it has proved impossible for the R.S.G.B. Contests Committee to offer to organise a similar international contest this year.

## Granfield DX Contest

Region 5 members are asked to note that the annual contest for the "Granfield DX Trophy" will be held from 2300 GMT, Saturday, November 13, to 2030 GMT, Sunday, November 14. To avoid a clash with the *CQ Magazine* international contest, the original dates have been changed. Entry forms and full particulars may be obtained from Mr. F. A. E. Porter, 38 Montague Road, Cambridge.

# 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

### July 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, July 13th, 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).

*American Technical Publications.*

The Secretary reported that he had made application to the Board of Trade for a limited Open General Licence to permit the Society again to import U.S. technical publications.

*Membership.*

*Resolved*:—

(*a*) to elect 119 Corporate Members, 34 Associates and 3 Junior Associates (Total elected 156).
(*b*) to elect Mr. W. L. Ely, BRS1535, a Life Member.
(*c*) to elect to Corporate Membership six Associates who had applied for transfer.

*Affiliated Societies.*

Resolved to grant affiliation to the Risley Amateur Radio Society and the Uxbridge and District Amateur Radio Society.

*Proposed Changes to Articles of Association—Subscription Rates.*

It was reported that Mr. F. H. Osborne of Chingford, Essex, had circulated a letter to certain T.R.'s requesting them to enlist the support of local members in protesting to the Council against the view put forward by the Hon. Treasurer in his last Annual Report that subscription rates may have to be increased.

Consideration was given to two letters received from the Brighton and Hove, and Portsmouth T.R.'s, both of which had been inspired by the circular sent out by Mr. Osborne.

Resolved to make no reply at the present time.

It was pointed out during the discussion that no change in subscription rates can take place without the approval of the membership at an Annual or Special General Meeting.

Mr. Auchterlonie asked for it to be recorded that members in the Manchester Area have every confidence in the Council.

Resolved to instruct the Society's Solicitors to draft a Resolution which will give the Society the power to vary subscription rates on the recommendation of the Council at an Annual or Special General Meeting.

*Electrical Trades Union.*

Resolved not to accept for publication in the Society's Journal an announcement advertising the Electrical Trades Union.

The view was expressed during the discussion that the Society's Journal was an unsuitable medium for such announcements.

*Summer Recess.*

Resolved:

(*a*) not to hold a meeting of the Council during the month of August, 1948.
(*b*) to authorise the President and the Chairman of the Membership Committee to deal with all applications for membership received up to August 17th, 1948.
(*c*) to authorise the President, Executive Vice-President and General Secretary to deal with all urgent business arising during the recess.
(*d*) to hold the next Meeting of the Council on September 14th, 1948.

*Future of the British Empire Radio Union.*

Consideration was given to a memorandum from Mr. A. E. Watts dealing with the future of the B.E.R.U.

Resolved to record that the Society will continue

(*a*) to assist groups of members in the Colonial Empire on matters affecting amateur licences.
(*b*) to appoint B.E.R.U. Representatives when requested to do so by Corporate Members resident in a particular Colony.

*Benevolent Fund.*

Consideration was given to a suggestion put forward by Mr. C. H. L. Edwards that the Society should inaugurate and operate a Benevolent Fund.

Mr. Edwards drew attention to the fact that a successful Benevolent Fund has been operated, for many years, by the Institute of Electrical Engineers. He considered that members generally would support such a project. Several members spoke against the suggestion pointing out that a Benevolent Fund is outside the scope of an Amateur Radio Organisation.

Mr. Watson considered that the operation of such a Fund would give rise to many administrative difficulties. Mention was also made of the new National Health Service.

Mr Watts recalled that in the past, when called upon for help, local members had responded promptly to every appeal and had donated generously. He believed members would continue to respond to specific cases requiring assistance in their own area.

After a lengthy discussion Mr. Morton Evans moved, Mr. Watson seconded and it was

Resolved (by 5 votes to 4 with two Members abstaining and the President not voting) not to proceed with the suggestion that the Society should operate a Benevolent Fund.

Resolved to record the thanks of the Council to Mr. C. H. L. Edwards for preparing a set of draft rules based on the rules of the I.E.E. Benevolent Fund.

*Finance.*

Resolved to accept and adopt the Cash Account for the month ended June 30th, 1948.

*Deputy QSL Manager.*

Resolved to record the thanks of the Council to Mr. M. Frost, BRS10234, who had undertaken the duties of QSL Manager during the absence of Mr. and Mrs. A. O. Milne on vacation.

*Reports of Committees.*

The Reports of the Membership and Scientific Observations Committees were submitted and adopted. Mr. Scarr referred to the valuable assistance which the Scientific Observations Committee had received from Dr. R. L. Smith-Rose.

*B.E.R.U. Contests.*

It was agreed to request the Contests Committee to give consideration to a suggestion that telephony operation be permitted during future B.E.R.U. Contests.

*Headquarters' Station.*

Resolved to bring the station into service on September 1st, 1948, and to recommend the appropriate Sub-Committee to consider a suggestion that the marker service be continued to a later hour than midnight (local time).

Resolved to request the G.P.O. Liaison Committee to consider ways and means of using the Headquarters' station for amateur communication purposes.

*Exhibition.*

It was reported that all stand space had been reserved.

The meeting terminated at 9.10 p.m.

### Society Trophies 1948/9

The Council has made the following awards for the year 1948/9:—

*Rotab Cup* to Mr. A. O. Milne, G2MI in recognition of his achievement in maintaining direct radio-phone contact—often late at night—with the Society's representatives to the Atlantic City Conference.

*Wortley-Talbot Trophy* to Mr. H. A. M. Clark, G6QT, in recognition of his many valuable technical contributions to the Society.

*Courtenay Price Trophy* to Mr. R. L. Varney, G5RV, in recognition of his successful work in connection with the suppression of television interference.

### Pilot Officer Norman Keith Adams Prize

Acting on the advice of the Technical Committee the Council has resolved not to award the Pilot Officer Norman Keith Adams Prize for the year 1947-8.

In the opinion of the Technical Committee no contribution to Volume XXIII of the Society's Journal reached a sufficiently high standard to warrant a recommendation being made to the Council.

## Representation

The following are additions or amendments to the list of Representatives published as a Supplement to the February issue.

### County Representatives

Region 1.
*Cheshire* .. .. J. Rudkin, G3CDW, White Knoll, St. Margarets Road, Hoylake.
*Lancashire, West*.. A. Adams, G5AD, 11 Priory Crescent, Penwortham Hill, Preston.

Region 6.
*Bedfordshire* .. F. Halstead, G3ASD, 24 Carlton Close, Luton.

Region 9.
*Gloucestershire* .. R. R. Waite, G3PZ, 254 Cheltenham Road, Gloucester.

Result of ballot :—Mr. Waite, 56 votes ; Mr. Smith, 31 votes.

### Town Representatives

Region 3.
*Warwickshire—Kenilworth, Warwick and Leamington* .. B. Warren, G6CI, 1 Crackley Crescent, Kenilworth.

Region 6.
*Bedfordshire, Luton* J. A. Plowman, G3AST, 119 Farley Hill.

Region 8.
*Sussex, Brighton* .. R. J. Donald, G3DJD, 2 Canfield Road.

Region 11.
*Llandudno* .. A. Evans, GW4MZ, Bloomsbury, Rhuddlan Avenue.

### Vacancies

Mr. N. A. Champness, G2AAU, and Mr. A. J. Colley, G8CC, have resigned as Town Representatives for Chelmsford and Bristol respectively. Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by October 31st, 1948.

* * *

Mr. E. H. Ricketts, G3PV, having resigned as C.R. for the part of Hertfordshire outside the London Region, a vacancy for that office now exists.

Nominations should reach the General Secretary by not later than October 31st 1948.

* * *

Due to pressure of private business Mr. F. C. White, G3XP, of Bournemouth has resigned as Region 8 Representative.

Nominations for his successor, made in the prescribed form, should reach the General Secretary by not later than October 31st, 1948.

## Slow Morse Transmissions

| | |
|---|---|
| Mondays | 20.00 B.S.T., 1900 kc/s. .. G2AJU (Stowmarket) |
| Mondays | 20.00 B.S.T., 1800 kc/s. .. G2DJS (Bradford) |
| Mondays | 21.00 B.S.T., 1900 kc/s. .. G3BLN (Bournemouth) |
| Tuesdays | 22.00 B.S.T., 1896 kc/s. .. G8TL (Ilford) |
| Tuesdays | 23.00 B.S.T., 1820 kc/s. .. GM4AN (Kirkcaldy) |
| Wednesdays | 22.00 B.S.T., 1800 kc/s. .. G3DLC (Grays) |
| Thursdays | 22.30 B.S.T., 1803 kc/s. .. G3OB (Manchester) |
| Fridays | 19.00 B.S.T., 1900 kc/s. .. G3BLN (Bournemouth) |
| Fridays | 20.00 B.S.T., 1900 kc/s. .. G2AJU (Stowmarket) |
| Fridays | 20.30 B.S.T., 1868 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.

## The R.S.G.B. QSL Service

The QSL service is free to members of the Society. Outgoing cards should be sent direct to the QSL Manager, Mr. A. O. Milne, G2MI, 29 Keehill Gardens, Bromley, Kent, and should be addressed individually by call-sign only. Suitable sized envelopes, stamped (2½d.) and self addressed should be sent to collect incoming cards. Please write your call-sign in bold letters in the top left-hand corner of each envelope.

Please sort your cards into countries and the W's into W districts. Members are asked to ensure that packets of cards are adequately prepaid to avoid the payment of excess postage.

Many amateurs do not collect their cards. Reminder cards are sent to those having a large number outstanding and if no reply is received within one month a further reminder is sent. If this is ineffective the cards are destroyed. All subsequent cards for these stations are destroyed as they arrive.

Non-members may collect their cards but may not send cards through the Bureau.

Members in the following areas may send their envelopes direct to the addresses shown below, but outgoing cards must be sent to G2MI, and not to the sub-managers.

GC .. R. Postill, Victoria College, Jersey, C.I.
GD .. T. R. Moore, Brackenhill, St. John, I. of M.
GI .. W. H. Martin, Greenisland Lodge, Greenisland, Co. Antrim, N.I.
GM .. D. Macadie, 154 Kingsacre Road, Glasgow, S.4.
GW .. E. A. Hayward, 6 Kenfig Road, Gabalfa, Cardiff.

## Headquarters' Station

The Council records its thanks to *Sir Joseph Causton & Sons, Ltd.* (the Society's printers), for the gift of QSL cards which will be used to confirm the reception of signals from GB1RS.

## Can you help ?

Mr. H. A. M. Clark, G6OT, 119 Wynchgate, Southgate, London, N.14, is anxious to purchase or borrow a copy of the R.A.F. manual on the Bubble Sextant, Mark IX A.

* * *

Mr. J. E. Archbold, G3CEP, 1 Hutton Avenue, West Hartlepool, would appreciate information on the Power Unit 208.

* * *

Mr. R. J. Pigou, G3CRP, Moor Lodge, Hawkhurst, Kent, requires the circuit diagram and component values of the ex-R.A.F. receiver R1585 which is also known as the R-4/ARR-2 or SC-1312-A.

* * *

Mr. J. C. Tranter, G3BQQ, 78 New Street, Wellington, Shropshire, needs the technical manual for the BC-221-AE. In return he can offer the manual for the AH model.

* * *

Mr. H. C. L. Barnett, G2AIQ, 1 The Crescent, Sea Front, Hayling Island, Hants, seeks details and base connections of the CV67 and information on the R.A.F. tuning unit type 207A.

* * *

Mr. S. V. Honeyman, BRS10398, 67 Haverhill Road, Balham, London, S.W.12, requires details of the Test Set type 73.

* * *

Mr. L. R. Turnbull, BRS14528, 69 Pretoria Road, Larbert, Stirlingshire, would welcome advice on converting the RF27 to cover 28 Mc/s.

* * *

Mr. L. A. Bell, BRS16235, 4 St. Boniface Villas, East Street, Ventnor, I.O.W., would like to obtain circuit details of the ex-R.A.F. Test Set type 160A.

* * *

Mr. A. Beattie, BRS5678, 74 Tenters Street, Bury, Lancashire, requires information on the A.M. receiver type R.1082.

* * *

Mr. C. A. J. Boswell, G3CHL, 87 Abbey Road, Warley, Smethwick, would like to hear from any member who has modified the BC-348-N receiver for A.C. mains operation. In return he can loan a circuit diagram of the BC-348-L.

## Amateur Radio International Friendship Association

Further to the statement published in the May issue of the BULLETIN under the title " Amateur Radio's Own Marshall Aid Plan " we have been asked by Mr. B. A. M. Herbert, G2WI, 18 Leamington Close, Bromley, Kent, to explain that the purpose of the organisation in the U.K. is to send names and addresses of needy persons to Mr. W. Erich, W6AL, who in turn will arrange for food parcels to be despatched to the persons recommended by Mr. Herbert and his County Managers.

Members who have time to devote to this scheme are requested to write to Mr. Herbert.

Volunteers who have already taken up the work as County Managers are :—

*Staffs.*—Dan Poole, G3AQW, 13 Oldfield Ave., Norton-le Moors, Stoke-on-Trent.

*Cheshire.*—W. Howarth, G3AHF, 16 Alfred St., Northwich, Cheshire.

*Durham.*—T. M. Horton, BRS14792, 35 Robinson St., Sunderland, Co. Durham.

The names and addresses of necessitous persons should be sent to Mr. Herbert or to the nearest County Manager.

## London (I.E.E.) Meeting

Nearly 200 members were present at the Institution of Electrical Engineers on Friday, September 24, 1948, when Mr. F. Charman, B.E.M., G6CJ, delivered a revised edition of his Scale Model Aerials lecture. The accompanying demonstration was followed with interest.

The Chair was taken by the Executive Vice-President, Mr. W. A. Scarr, M.A., G2WS, and a vote of thanks to the lecturer was proposed by Mr. A. O. Milne, G2MI.

## Side Slip

An error occurred in the table accompanying Fig. 1 of the article " The Design and Construction of a Multi-Range Test-meter " published in the September BULLETIN. The values for the D.C. Voltage Resistors are transposed and should read as follows :—

| | | | | | |
|---|---|---|---|---|---|
| R1 | .. | 10 MΩ, 5 w. | R3 | .. | 100,000Ω, ½ w |
| R2 | .. | 1 MΩ, ½ w. | R4 | .. | 9,300Ω, ½ w. |
| | | | R5 | .. | 300Ω, ½ w. |

In case any confusion may have arisen, the author wishes to confirm that the points X1, X2 and X5 of the switch S3 are *not* electrically tied, the are shown being intended merely to indicate that a rotary switch should be employed. This will become clear upon comparison with S1 and S2.

## CQ

The publishers announce that, due to increased production costs, the foreign subscription rate for *CQ* is now $4 per annum.

Headquarters are therefore reluctantly compelled to raise their price from 17/6 to 20/–.

In future, foreign subscriptions will be accepted for a term of *one* year only.

## Morse Classes in Sheffield

For the benefit of Morse students in the Sheffield area a series of classes is being arranged to take place at 26 Crescent Road. The C.R. and T.R. will be glad to hear from porspective candidates.

# FORTHCOMING EVENTS

### REGION 1

**Accrington.**—November 10, 7.30 p.m., Cambridge Street Schools.
**Ashton.**—November 7, 3 p.m., New Jerusalem Schools, Katherine Street.
**Bolton.**—November 2, 8 p.m., Y.M.C.A.
**Burnley.**—November 3, 7.30 p.m. Mechanics Institute, Manchester Road.
**Bury.**—October 21, 28, November 4, 7.30 p.m., Club Room, Spring Mills, Tottington, Nr. Bury. November 11, 7.30 p.m., Athenæum, Market Street.
**Carlisle.**—November 5, 19, 7 p.m., Trades Hall, Scotch Street.
**Darwen and Blackburn.**—October 29 (business meeting), November 12 (lecture), 7.30 p.m. Weavers' Institute, Darwen.
**Manchester.**—November 1, 7.30 p.m., Reynold's Hall, College of Technology, Sackville Street.
**Oldham.**—October 20, November 3, 17 7.30 p.m., Civic Centre, Clegg Street.
**Rochdale.**—November 7, 3 p.m., Drill Hall, Baron Street.
**Workington.**—October 16, 6.30 p.m., St. John's Room.

### REGION 2

**Barnsley.**—October 22, November 12, King George Hotel Peel Street.
**Bradford.**—November 2, November 16, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
**Catterick.**—Tuesdays, 7 p.m., Loos Lines, Catterick Camp.
**Doncaster.**—Tuesdays and Wednesdays, 7.30 p.m., 73 Hexthorpe Road.
**Harrogate.**—Wednesdays, 7.30 p.m., Rear of 31 Park Parade.
**Huddersfield.**—November 3, 17, 7.30 p.m., Plough Hotel, Westgate.
**Hull.**—October 27, 7.30 p.m., Imperial Hotel, Paragon Street.
**Leeds.**—Fridays, 7.30 p.m., Swathmore Settlement, Woodhouse Square.
**Middlesbrough.**—October 25, November 8, 7.30 p.m., 400 Linthorpe Road.
**Newcastle.**—October 25, 8 p.m., British Legion Rooms, 1 Jesmond Road.
**Sheffield.**—October 27, 8 p.m., "Dog and Partridge," Trippet Lane. November 10, 8 p.m., Albreda Works, Lydgate Lane.
**South Shields.**—Fridays, 7.30 p.m., Trinity House, Laygate.
**Spenborough.**—October 27, November 10, 7.30 p.m., Temperance Hall, Cleckheaton.
**Sunderland.**—Wednesdays and Fridays, 7 p.m., Prospect House, Prospect Row.
**York.**—Wednesdays, 8 p.m., 29 Victor Street.
**Tees-Side Amateur Radio Society.**—November 7.

### REGION 4

**Derby.**—November 10, 7.30 p.m., The Club Room, 67B London Road. Mullard Education Series, Part I.

### REGION 5

**Cambridge.**—October 29, 7.30 p.m., "The Jolly Waterman."
**Chelmsford.**—November 2, 7.30 p.m., 184 Moulsham Street.
**Southend D.R.S.**—October 15, 29, November 12, 7.45 p.m., Room 12, The Main Building, Municipal College.
**Southend.**—October 22, 7.45 p.m., G2SO, The Chalet, Woodside, Leigh.

### REGION 7

**Chingford, N.**—October 28, 7.45 p.m., 25 Moreland Way. November 11, 7.45 p.m., 7 Cranworth Crescent.
**Croydon (Surrey R.C.C.).**—November 9, 7.30 p.m., "Blacksmiths Arms," South End.
**Barnes and Putney.**—November 9, 7.30 p.m. 28 Nassau Road, S.W.13.
**East London.**—October 24, 2.30 p.m., "Harmonic Measurement and Suppression," R. L. Varney, G5RV. November 21, 2.30 p.m., "Fun and Games," G2CD. Lambourne Room, Ilford Town Hall.
**Edgware and District Radio Society.**—October 20, 27, November 3, 10, 17, St. Michael's School, Flower Lane, Mill Hill.
**Enfield.**—October 17, November 21, George Spicer Schools.
**Hoddesdon.**—November 4, 8 p.m., Salisbury Arms Hotel.
**Holloway, Grafton Radio Society.**—Every Monday, Wednesday and Friday, 7.30 p.m., Grafton School, Eburne Road (near "Nag's Head").
**London.**—October 29, 6.30 p.m., Institution of Electrical Engineers, S.W.1., P. F. Cundy, A.M.I.E.E., G2MQ, "Speech Clipping."
**Peckham.**—November 1, 7.30 p.m., "The Kentish Drover," Rye Lane.
**Southgate.**—November 5, 7.30 p.m., The Merry Hills Hotel (Oakwood Station).
**St. Albans.**—November 10, 8 p.m., "The Beehive," London Road.

### REGION 8

**Reading.**—October 9, 30, November 13, 6.30 p.m., Palmer Hall, West Street. October 31, Hamfest, 2.30 p.m., "Peoples Pantry," Cross Street.
**Southampton.**—November 6, 7.30 p.m., 22 Anglesea Road, Shirley.

### REGION 9

**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. Judes.
**Weston-super-Mare.**—November 5, 7.30 p.m., Y.M.C.A., 2 Briston Road.

### REGION 14

**Glasgow.**—October 27, 7 p.m., Institute of Engineers and Shipbuilders, 39 Elm Bank Crescent.

## Blackpool Amateur Radio Society

The Blackpool and Fylde Amateur Radio Society has now succeeded in securing new accommodation situated near the centre of the town. Regular meetings will in future be held on the third Tuesday of each month at the Chamber of Trade Hall, 1st Floor, 53 Queen Street, Blackpool.

## Bradford Amateur Radio Society

The Annual Meeting of the Society was well attended by old and new members who heard the Officers give a most satisfactory account of activities and finances during the past year. Dr. G. N. Patchett of Bradford Technical College was elected President and the Vice-Presidents include Messrs. C. A. Sharp (G6KU) (Regional Representative), J. H. Macdonald (G4GJ) (Town Representative), E. J. Simonard (G2CQY) and J. H. Bateman (G6BX). Messrs. J. Bradford (G2CQF) and W. S. Sykes (G2DJS) continue in the respective offices of Treasurer and Secretary. In his report the Secretary disclosed details of a very full syllabus and appealed for the fullest support at meetings, particularly those to which commercial interests were arranging to send lecturers. Members were pleased to meet Mr. G. E. Ferrar who was paying his first official visit to the area following his recent appointment as C.R. for the West Riding.

## The Grafton Radio Society

A series of lectures covering the syllabus of the Radio Amateurs' Examination is to be commenced shortly by the Grafton Radio Society (G3AFT) which meets every Monday, Wednesday and Friday at 7.30 p.m. Morse instruction is also given and the Club now has a good supply of components with which to carry out its constructional programme. At the recent A.G.M., Mr. B. Randall, B.Sc. (GW3ALE) was again elected President. Prospective members should contact the Hon. Secretary, Mr. W. H. C. Jennings (G2AHB), Grafton Radio Society, Grafton School, Eburne Road, London, N.7.

## Reading and District

A short course covering the syllabus of the Radio Amateurs' Examination has been prepared by the local Technical College. Classes are held at the Wilson School, Wilson Road, Reading, each Tuesday at 7 p.m. Prospective candidates should enrol at the Head Office, 1 London Road, Reading. The fee of 7s. 6d. will be waived for students under 19 years old.

## Slade Radio Society

The 21st anniversary of the Society was marked by a special series of meetings culminating in the Birthday Dinner on October 8. Forthcoming activities include:

Oct. 29 *The Station at G2IB, with some reminiscences of the early days of Slade Radio*, by Mr. J. G. McVie.
Nov. 12 Sale of Surplus Gear.
Nov. 26 Annual General Meeting.
Dec. 10 Demonstration of Home Recording, by Mr. D. O'C. Roe.

Meetings commence at 8 p.m. and are held at the Parochial Hall, Slade Road, Erdington, Birmingham, 23.

## Television Society—Midlands Centre

Visitors are welcome at the meetings of the Midlands Centre of the Television Society. Forthcoming lectures include:

Nov. 2 *Luminescent Materials for Cathode Ray Tubes*, by Dr. G. F. J. Garlick.
Dec. 1 *Studio Technique in Television*, by Mr. D. C. Birkinshaw, M.B.E., M.D.
Jan. 4 *Television Applications other than Entertainment*, by Dr. W. Sumner.

Meetings commence at 7 p.m. and are held at the Chamber of Commerce, New Street, Birmingham.

## West Middlesex Amateur Radio Club

Evidence of the gradual expansion of the Club is to be found in the number of new faces seen at every meeting. The call G3EDH has been allocated to the Club and should soon be heard on the air. Recent activities included a visit to the B.B.C. transmitter at Brookman's Park and an exhibition of members' equipment. Meetings are held at 7.30 p.m. on the second and fourth Wednesdays of each month at the Labour Hall, Uxbridge Road, Southall, Middlesex.

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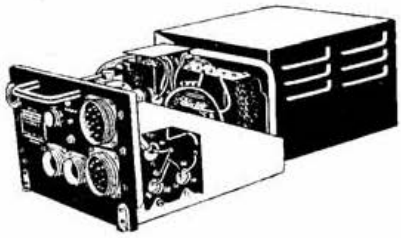

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FOR SALE.—Seventy-three valves, two 6 in. C.R. tubes, two 500 kc/s. crystals, large amount resistors, switches, condensers, etc., reasonable offers accepted.—BRS13384, Lower Goatacre, Calne, Wilts. [347

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WANTED.—AR88 case, black crackle preferred, also Avo 40, state condition and price.—82 Framingham Road, Brooklands, Manchester. [371

WANTED.—Circuit Diagram of B28 Receiver, also valves—6K8G, 6Q7G, 5Z4G; please write stating price, etc.—BRS11230, 11 Alton Place, Longbenton, Newcastle-on-Tyne. [315

WANTED.—December, 1946 issue Q.S.T., also "Gen" on ex-R.A.F. type 1143 V.H.F. transceiver; contact, D. V. R. RAO, Wireless College, Colwyn Bay. [341

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955's, 7s.; 12SJ7's, 6s.; 6K7G's, 5s.; U16's, 3s. 6d.; selenium rectifiers 500 volts 60 mA output, 5s. 6d.; Aerovox oil-filled 2 mF 1,000 volt working, will stand 4,000 volts, 32s. 6d. doz.; all unused.—VE3ABW, 28 Camden Avenue, Feltham.

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